

eLTER PLUS

European long-term ecosystem, critical zone and socio-ecological systems research infrastructure PLUS

H2020 – INFRAIA-2019-1 project 871128

D4.2 Workflow for retrieval and harmonisation of data from official statistics

Version: 3.0

Date: 31.01.2022

Authors: Ľuboš Halada (ILE SAS), Jan Dick (UKCEH), Will Bolton (UKCEH), Petra Gašparovičová, Hubert Hilbert, Zuzana Baránková, Lucia Gemmelová, Ivana Kozelová, Pavol Kenderessy, Tomáš Rusňák (all ILE SAS)

Contributors: John Watkins, Ute Skiba, Chris Andrews (all UKCEH), Jaana Bäck, Terhi Rasilo (both UH), Michael Mirtl, Ulf Mallast (both UFZ), Johannes Peterseil, Thomas Dirnböck (both EAA), Bastian Bertsch-Hormann (BOKU), Jessica Parland-von Essen (CSC), Daniel Orenstein, Merav Cohen (both IIT), Mihai Cristian Adamescu (UB), Ricardo Díaz-Delgado, Diego Garcia Diaz, Kylli Ek, Pablo F. Méndez (all CSIC), Sabrina Gaba (CNRS), Vladan Minic (BSI)

Reviewers: Carmela Marangi, Johannes Peterseil (EAA), Daniel Orenstein (IIT), Ricardo Díaz-Delgado (CSIC), Mihai Cristian Adamescu (UB)

Version history

Version	Date	Status and description	Distribution to
0.1	30/04/2020	Pre-draft for internal WP4 use	Antonello Provenzale
1.0	30/11/2021	Draft for internal WP4 use	Carmela Marangi
2.0	15/01/2022	Draft for internal review	Carmela Marangi, Johannes Peterseil, Daniel Orenstein, Ricardo Díaz-Delgado, Mihai Cristian Adamescu
3.0	31/01/2022	Final report	Jaana Bäck

Content

1. Executive summary.....	1
2. Introduction	3
3. eLTER data requirements.....	4
4. Data sources identification	8
4.1 Data sources at EU level.....	8
4.2 Data sources at national level.....	10
5. Workflow for retrieval and harmonisation of data from official statistics	12
5.1 Pilot phase.....	13
5.2 Workflow proposal	17
6. Conclusions.....	20
7. References consulted	21
8. Abbreviations and glossary	21
9. Annexes	24
Annex 1: List of standard observations and their relevance for T4.2	24
Annex 2: Description of statistical data platforms relevant for eLTER.....	29
Annex 3: Catalogue of datasets.....	55
Annex 4: Summary of feedback from the eLTER cookie-cutting DataLabs demonstration on 17 th and 18 th September 2020	111
Annex 5: Example of National scale geographic units – Scotland.....	124

1. Executive summary

This document describes main achievements of the eLTER PLUS task 4.2 (further T4.2). T4.2 aims to identify official data sources that provide official statistics relevant and useful for eLTER and propose a way to make them available to the eLTER user community. The document is also proposing and testing a standard workflow to retrieve available variables relevant for the eLTER Standard Observations from European and national statistics that are identified as relevant for LTSEr platforms and associated eLTER sites. The workflows for retrieving, harmonising, and making available pan-European and national statistics at a relevant resolution should be further trialled within the eLTER DataLabs (virtual research environment) provided by eLTER PLUS Work Package 11, and resulting data products will be made accessible and visualized in the eLTER Data Information System.

We followed the process development in several eLTER PLUS work packages, especially WP8, WP9 and WP4 (task T4.5) to identify data requirements of the eLTER community. Their achievements were integrated with development of eLTER Standard Observations outlined in the eLTER PLUS deliverable D3.1 *Discussion paper on key standard observation variables* (Zacharias et al. 2021). The suggested list of standard observations selected in D3.1 provided the structure for the variables tested in our proposed workflow. The deliverable D3.1 contains 179 suggested variables that were found important for long-term ecological research. We evaluated these variables in terms of the availability of statistical data (Annex 1) and found 30 variables as available (sources of statistical data exist) and another 20 variables as possibly available (sources of statistical data probably exist).

We systematically screened almost 30 main EU-level and global data platforms for availability of statistical data related to the identified variables of interest. Not surprisingly, Eurostat is the most important source of statistical data for Member States of the European Union and for some other European countries. Descriptions of the data portals screened are provided in Annex 2 of this report. Our aim was to identify data sources with the highest possible spatial resolution in order to provide the most appropriate data at the level of the eLTER sites or platforms; however, most data are only available for larger administrative units, commonly at NUTS2 or NUTS3 level. Data on the local level (LAU – Local Administrative Units) are available for a limited set of variables, mostly demographic variables. For each dataset related to standard variables, we prepared metadata describing the relevant dataset. Metadata contain all information needed for future incorporation of the dataset to the eLTER Information System. We prepared metadata for 116 datasets that are related to 42 standard observation variables, for which we found suitable data sources. They are included in this report as Annex 3.

We next developed and tested the workflow of data retrieval with a subset of the variables. The selected variables for the subset were: *population density*, *employment by sectors*, *deaths due to COVID-19*, and *land cover*. These variables were selected to test datasets with varying temporal and spatial resolution stored both as tabular and raster format. For these variables we identified suitable data sources, prepared metadata with their description and downloaded data. We downloaded tabular data in two formats - as text (csv) and as a table (xlsx) and stored on the eLTER server. In the next step, the data were processed in the DataLabs environment (for more information on DataLabs see Annex 4 and website <https://datalab.datalabs.ceh.ac.uk/projects/elter/info>). The cookie-cutting or clipping application was used for extraction of data clipped for the region of interest – in this pilot phase we used LTSEr platform boundaries agreed in WP4.5 as target territories. Using DataLabs we prepared outputs in the form of csv files, graphs, and maps. This pilot tested the proposed workflow enabling a full cycle for retrieval and harmonisation of data from official statistics to be formulated. The pilot phase was tested with key members of the eLTER community (WP 4, 8, 9, 10, 11) during a workshop held on 17th and 18th September 2020 (Annex 4). In this workshop we presented our approach, cookie-cutting application and results for piloting variables. Participants provided feedback

related to variables, data sources, and cookie-cutting tool. The documentation and click-by-click tutorial for the cookie-cutting tool were prepared and they are available for users (see section 5).

Based on outcomes and feedback of the workshop, we made one major revision of the proposed workflow. The workflow used in the pilot phase was found functional and useful, but it used only one approach: “manual” data download and storage on an eLTER server. Based on this feedback, we determined the need for an additional workflow for automated retrieval of requested data directly from the provider’s portal when available – this would enable users to receive and work with the most recent version of data. However, such an approach is feasible only if the data portal offers use of an Application Programming Interface (API).

Therefore, the final proposed workflow (Figure 1) contains two branches: one for *statistical data*

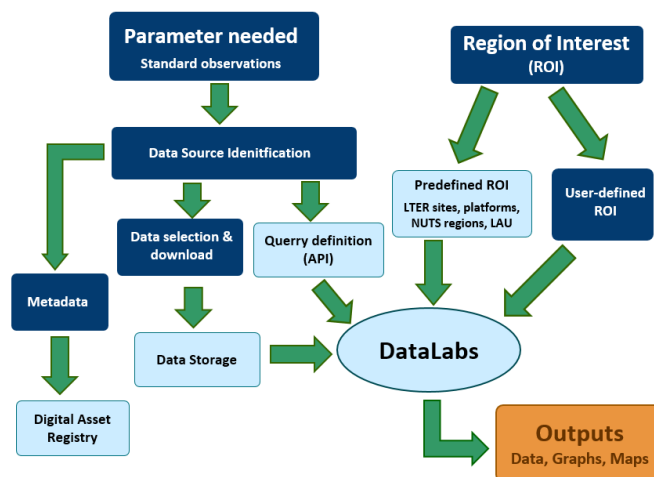


Figure 1: Proposed workflow for statistical data

retrieval and one for selection of *Region of interest* (ROI). The statistical data branch (Fig 1 left side) starts with identification of user-defined variable, continues through data source identification and metadata preparation. Then, for portals with API a query definition for data extraction needs to be prepared, while in cases of portals without API, data are selected, downloaded and stored. The second branch of the workflow related to Region of interest (ROI) (Fig 1 right side) starts with ROI definition by the user. It is also possible to select from standard, pre-defined ROIs, e.g. administrative regions like NUTS, LAU, LTER sites, or LTSEER platforms boundaries. In addition, users could define a ROI relevant for their purpose. When the data and ROI are ready, their processing in DataLabs can start. So far, we used the cookie-cutting application for data processing, but we expect that in the future a broader spectrum of applications will be implemented for data processing and outputs preparation. The elements of the proposed workflow that are part of the eLTER Information System are marked in light blue in the figure above.

The proposed workflow is part of the conceptual framework of data flow and processing for the eLTER community (Figure 2). This system is designed from the user perspective: It starts with user’s question (on the left) and uses functionalities of the eLTER Information System for preparation of the data products tailored for the user’s needs (on the right). Based on the (research) question, the user can select relevant dataset in the *Digital Asset Registry*, which is then extracted from the *eLTER Data Repository* or provided from an external data portal and processed by *eLTER Data processing tools and services*. eLTER PLUS WP11 is developing these components of the eLTER Information System. The result is a data product that either directly answers the user’s question or represents input needed for further analyses.

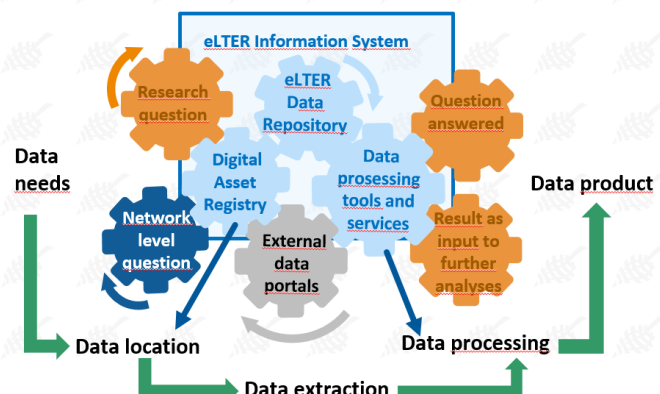


Figure 2: Foreseen statistical data flow and processing

The work completed in T4.2 is summarised in this report and associated annexes. It is written in a detailed structure, so it can be used directly to build parts of the *eLTER Data Information System*, especially the *Digital Asset Registry* and the *eLTER Data Repository*.

2. Introduction

There is a wealth of social, economic, and ecological data routinely collected by government agencies and made available in the form of official statistics. Official statistics are data published by government agencies or other public bodies such as international organizations as a public good. Official statistics can inform debate and decision making both by governments and by the wider community (UNSD 2021). They provide quantitative or qualitative information on all major areas of citizens' lives, such as economic and social development, living conditions, health, education, and the environment. Consequently, exploration of these long-term datasets is a priority for eLTER PLUS and relevant especially for the socio-ecological research in LTSE platforms. In addition, use of these data sources is cost-efficient as they are already openly available.

Official statistical data can be used to answer a range of questions related to a broad spectrum of eLTER issues. They can also be relevant at different levels of eLTER organisation – on the level of LTSE sites, LTSE platforms, for cross-site comparison or upscaling, and across the entire eLTER network. Examples of questions where official statistical data are relevant, are provided in Figure 3.

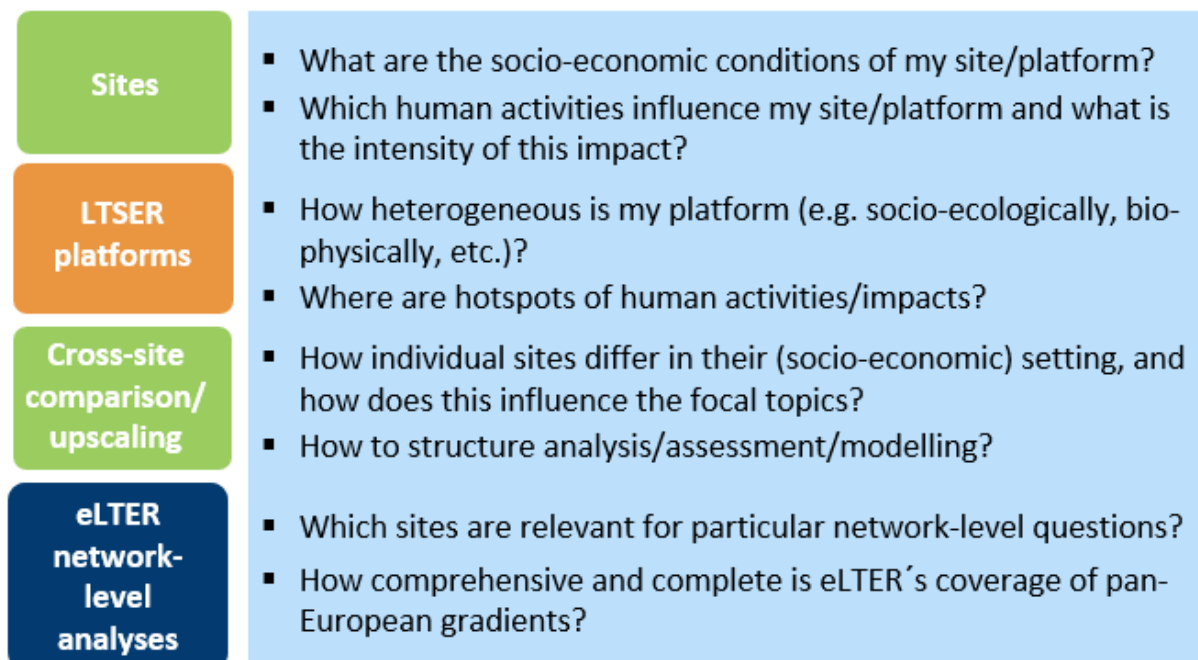


Figure 3: Examples of questions that can be answered using official statistical data in different eLTER levels

In the eLTER PLUS project, the work package 4 aims to: (1) develop the workflows for statistical data harvesting and user uptake from different information sources and integrate them with eLTER data, leading to eLTER Information Clusters; (2) make best use of Copernicus and other RS data based services ... and (3) piloting workflows of data harvesting and incorporation into eLTER Data Integration Portal (DIP). The background of the WP4 and its links to other parts of the eLTER PLUS project is specified in the WP4 description as follows:

“Striving for whole system research, the usage of data from all available sources is needed to broaden the thematic, spatial and temporal scope and enable gap filling of information gathered directly at eLTER in-situ facilities. WP4 aims to define strategies and workflows and to elicit prior knowledge for integration of data from multiple sources, including eLTER legacy data and external information sources (e.g. for gridded data, other in-situ data, Remote Sensing products, and official statistics). WP4

will focus on priority variables and information in the catalogue of eLTER Standard Observations (WP3) and support the WP8 and WP9 Case Studies. WP4 will trigger the service development carried out by WP11 both in terms of establishing the structures for incorporating information into eLTER DIP (WP11.2) and considering them in discovery and visualisation (WP11.3)."

The T4.2 should identify data sources that provide official statistics relevant and useful for eLTER and propose a way to make them available to the eLTER user community. The T4.2 description specified the task aim as follows:

"This Task will develop and test a workflow to retrieve variables available of relevance for the eLTER Standard Observations (Task 3.1) from European and national statistics which are relevant at LTSEr platforms and associated eLTER sites. Requirements as raised by eLTER Platform managers involved in Task 8.4 will trigger the approach. The workflows for retrieving, harmonising, and making available pan-European and national statistics at a relevant resolution will be trialled within the data labs of WP10, and resulting data products made accessible and visualized in eLTER DIP (WP10)".

3. eLTER data requirements

The eLTER data requirements are developing gradually and incrementally, and in the eLTER PLUS project they are updated in several work packages. The data needs will also be critically dependent on topical research questions that are pursued at the eLTER RI in future. The main input to current data requirements comes from following tasks:

- WP3: Interoperability of eLTER Standard Observation variables – The User Perspective, especially its task T3.1 Selection and prioritization of variables and standards from the perspective of eLTER RI scientific users
- WP8: eLTER Whole System Approach at site and catchment scale; especially T 8.4 Socio-ecological analyses of stakeholder-defined local and regional environmental challenges
- WP9: Optimisation of the eLTER Network design at the pan-European scale
- WP10: Define core data and ICT needs and pilot data workflows

Table 1: Schedule of relevant Milestones

WP	M	Milestone title	Lead	Due date
4	MS8	Key variables and sites for eLTER Information Cluster pilots	UKCEH	31 Jan 2021
11	MS27	Data Management Plan	UKCEH	31 Jan 2021
4	MS9	Integrated list of socioecological essential variables	UKCEH	31 Jul 2021

M – milestone

Table 2: Deliverables relevant for Task 4.2

WP	D	Deliverable title	Lead	Due date
11	D11.1	Overarching Data Management Plan for eLTER data	UKCEH	31-Jul-2020
8	D8.5	Report on data requirements (CS1-4) to be used in VA and WP10	UKCEH	31-Jul-2020
9	D9.5	Report about data requirements (CS1-4) to be used in VA and WP10	SYKE	31-Jul-2020
10	D10.2	Data and ICT needs from the RCs to be used in VA	EAA	31-Oct-2020
3	D3.1	Discussion paper on key standard observation variables	UFZ	31-Jan-2021

D - deliverable

For T4.2, it was important to maintain contact with these WPs to coordinate and respond to developments in the progress of defining their data requirements. The milestones important for T4.2 are listed in Table 1 and the deliverables providing an input to T4.2 are listed in Table 2. As the questions to be addressed by the eLTER community are dynamic, T4.2 has taken an adaptable approach such that our workflow can incorporate any variable offered in official statistical organisation that is currently required, or may be required in the future by the eLTER researchers.

The main list of variables was proposed in the early phases of the eLTER PLUS project. However, the principles established in the workflow developed in T4.2 facilitate adaptability to the future needs of the community.

The deliverable D3.1 *Discussion paper on key standard observation variables* (Zacharias et al. 2021) incorporated previous developments in the selection of variables in other tasks, so that paper served as a basis for further work on the current task. The deliverable D3.1 lists 179 variables organised in six domains: Abiotic characteristics; Socio-Ecology; Biotic heterogeneity; Energy budget; Water balance; and Matter budget. For each listed variable we assessed its relevance for task T4.2, i.e., if data for the variable are collected and available in official statistics (see section 4 below for a complete description of statistical resources consulted). We classified variables into four categories as specified in table 3.

Table 3: Categories used for assessment and number of the standard variables found in official statistics sources

Category	Category description	N	%
Available	Variable for which statistical data are collected and available	30	16.7
Possibly available	Variable for which statistical data are probably collected and available	20	11.2
Not available	Variable for which statistical data are not collected	126	70.4
Uncertain	No information and no estimate on availability of statistical data	3	1.7

N – number of variables in each category; % - the share of the category expressed as % of the total number of variables (179).

This classification guided us during screening of data portals for useful variables: we were focused on the first two categories, but did not avoid datasets for variables from other categories, if found. The full list of variables with their ranking to individual categories is presented in Annex 1 of this report. In the tables below we provide a summary list of variables found as relevant (Table 4) and possibly relevant (Table 5). The variable coding used in task 4.5 is provided to facilitate cross task coordination. Logically, due to the nature of the statistical resources consults (see section 4), all variables identified as relevant (Table 4) are from the socio-ecology domain recognised in D3.1. These variables represent priority workflows for task 4.2.

Table 4: Standard variables for which official statistical data should be available

Ecosystem Integrity* component	Compartment	Variable	T4.5 code
Socio-Ecology	Population	Population current activity status	19
Socio-Ecology	Population	Population industry	19
Socio-Ecology	Agriculture and Forestry	Area under tillage	1
Socio-Ecology	Agriculture and Forestry	Land-based income	2
Socio-Ecology	Agriculture and Forestry	Livestock feed management	3
Socio-Ecology	Agriculture and Forestry	Agricultural products	4
Socio-Ecology	Agriculture and Forestry	Harvest (cropland, grassland, forest)	5
Socio-Ecology	Governance and stakeholders	Basic services provision: health & education	8
Socio-Ecology	Land use and land cover change	Land use (historic)	9

Ecosystem Integrity* component	Compartment	Variable	T4.5 code
Socio-Ecology	Land use and land cover change	Land cover (CORINE)	10
Socio-Ecology	Land use and land cover change	Land use change	11
Socio-Ecology	Land use and land cover change	Land use (Statistics)	12
Socio-Ecology	Platform characteristics	NUTS3 and Local Administrative Units (LAU) spatial databases	16
Socio-Ecology	Platform characteristics	Per capita income / GDP per capita	17
Socio-Ecology	Population	Population age profile	18
Socio-Ecology	Population	Population status of employment	19
Socio-Ecology	Population	Population education attainment	20
Socio-Ecology	Population	Population residential profile/density	21
Socio-Ecology	Resource use	Resource use (biomass, construction, iron/steel, fossil fuels), trade of resources	22
Socio-Ecology	Resource use	Population consumption statistics	24
Socio-Ecology	Agriculture and Forestry	Farm gate economic return	26
Socio-Ecology	Agriculture and Forestry	Livestock (livestock units)	27
Socio-Ecology	Agriculture and Forestry	Irrigation management, timing, intensity	28
Socio-Ecology	Agriculture and Forestry	Fertilizer input (N, P, K, liming, pesticides)	29
Socio-Ecology	Governance and stakeholders	Property ownership/laws/institutions	33
Socio-Ecology	Population	Population occupation	36
Socio-Ecology	Population	Population place of birth	37
Socio-Ecology	Population	Living conditions in dwellings	38
Socio-Ecology	Resource use	Resource use (energy carriers, electricity, biomass, construction, iron/steel, fossil fuels)	41
Socio-Ecology	Transportation and Industry	Mobility information: accessibility indicators, means of transport	42

* Ecological Integrity as specified in eLTER PLUS deliverable D3.1, see also chapter 8 Abbreviations and glossary below; T4.5 code – code of variable used in Task 4.5

In table 5 are listed variables that are possibly available – we had no evidence of data sources for them, but they can exist. Socio-ecological variables represent almost half of the variables (10) in the second category (possibly available) followed by abiotic characteristics (7), water balance (2) and radiation budget (1) – see Table 5. Task 4.2 searched for sources of official statistical data also for these variables – they represent the second-order priority for task T4.2.

Table 5: Standard variables possibly available from official statistical data portals

Ecosystem Integrity component	Compartment	Variable	T4.5 code
Abiotic	Climate	Precipitation	
Abiotic	Climate	Air temperature	
Abiotic	Soil	Soil inventory	
Abiotic	Soil	Soil organic C content	
Abiotic	Soil	Soil total N content	
Abiotic	Soil	Soil total P content	

Ecosystem Integrity component	Compartment	Variable	T4.5 code
Abiotic	Soil	Soil pH	
Socio-Ecology	Resource Use	Subsidies programs / schemes	23
Socio-Ecology	Agriculture and Forestry	Grazing timing, intensity	25
Socio-Ecology	Governance and stakeholders	Wellbeing information of population	32
Socio-Ecology	Land use and land cover change	Land use (Archival cadastral)	34
Socio-Ecology	Platform characteristics	Number of tourists/visitors	35
Socio-Ecology	Resource use	Infrastructure physically and in terms of services available	39
Socio-Ecology	Resource Use	Records of important land users	40
Socio-Ecology	Transportation and Industry	Physical infrastructure networks	44
Socio-Ecology	Transportation and Industry	Buildings and other structures	45
Socio-Ecology	Transportation and Industry	Roads, Railways, settlement areas	46
Energy budget	Radiation Budget	Global solar radiation	
Water balance	Streams/Rivers	Discharge	
Water balance	Terrestrial	Snow cover	

* Ecological Integrity as specified in eLTER PLUS deliverable D3.1, see also chapter 8 Abbreviations and glossary below. T4.5 code – variable code used in Task 4.5

It is critical to notice that the Discussion paper on key standard observation variables (Zacharias et al., 2021) is undergoing internal eLTER consultations. It may be modified and updated periodically in light of the ongoing consultation and further eLTER development. With such future updates of standard observation variables, the list of relevant variables available from official statistics will be updated as well.

4. Data sources identification

For the identification of data sources useful for eLTER we used several criteria that the data platforms should meet, namely:

- if the data platform contains the variable(s) relevant for eLTER site/LTSER platform;
- if the data are available for download in a commonly used format (excel, csv, tsv, txt), or via an API (Application Programming Interface);
- if the data are free for non-commercial use (including research);
- if the spatial resolution held in the database is suitable for eLTER sites and LTSER platforms (e.g., scale or minimum mapping units);
- if there is available and accessible proper documentation of data collection and aggregation methods.

4.1 Data sources at EU level

The CLEVER Cities project (Littkopf & Haubold 2018) evaluated potentially useful European data platforms to support the monitoring of the effects of nature based solutions (NBS) in the urban environment. We used the list of EU data platforms prepared by the CLEVER Cities project as the starting point of our survey of suitable data sources. We evaluated usefulness of the data portals described in the CLEVER Cities project catalogue from the eLTER perspective (Dick & Halada 2020). Although the CLEVER Cities project selected the data portals of specific relevance to urban areas, our rapid evaluation suggested that many of these data sources should be investigated further as they are relevant also for eLTER. The following data portals were selected for inclusion in the CLEVER Cities catalogue (Littkopf & Haubold 2018):

- | | |
|--|--|
| • Urban Data Platform (JRC) | • European Climate Adaptation Platform |
| • JRC Data Catalogue (JRC) | • WISE – Water Information System for Europe |
| • Copernicus Land Monitoring Service (EEA) | • BISE – Biodiversity Information System for Europe |
| • EEA Spatial Data Infrastructure (EEA) | • European Forest Information Portal |
| • EEA DiscoMap (EEA) | • CDP – Disclosure Insight Action (former Carbon Disclosure Project) |
| • EEA Data and Maps | |
| • ESPON Database Portal | |

In the next step we surveyed other data portals that potentially contained data relevant for eLTER. We focused this survey initially on Eurostat and DG Agriculture data platforms. Eurostat was found, for the eLTER project, the most important statistical data source at the pan-European level due to its wide coverage and the large number and diversity of indicators used.

To get an overview of the data portals at the European level, it is possible to use the portals providing access to the other data portals, i.e.

- **The European Data Portal** (<https://www.europeandataportal.eu/en>). The European Data Portal harvests the metadata of Public Sector Information available on public data portals across European countries. Information regarding the provision of data and the benefits of re-using data are also included.
- **The European Union Open Data Portal** (EU ODP; <https://data.europa.eu/euodp/en/home>) gives access to open data published by EU institutions and bodies. All the data that can be found via the catalogue are free to use and reuse for commercial or non-commercial purposes.

Based on our survey, we provide a list of data sources potentially useful for eLTER (Table 6). More detailed description of these data portals can be found in Annex 2 of this report.

Table 6: List of data platforms identified as useful for the eLTER community

Data Platform name	Provider
Eurostat Themes	Eurostat
EU Policy Indicators	Eurostat
Eurostat Cross-cutting topics	Eurostat
Land Use and Coverage Area frame Survey (LUCAS)	Eurostat
Agricultural Census 2020	Eurostat, National statistical offices
EEA Spatial Data Infrastructure	EEA
EEA DiscoMap	EEA
EEA Data and Maps	EEA
Copernicus Land Monitoring Service	EEA
WISE – Water Information System for Europe	EEA
BISE – Biodiversity Information System for Europe	EEA
JRC Data Catalogue	JRC
Urban Data Platform	JRC
Agri4Cast Resource Portal	JRC
Digital Observatory for Protected Areas	JRC
EU Forest	JRC
European Alien Species Information Network	JRC
European Drought Observatory	JRC
Agri-Food Data Portal	DG Agri
Performance of agricultural policy	DG Agri
European Soil Data Centre	ESDAC
European Forest Information Portal	EFI
ESPON Database Portal	ESPON
European Climate Adaptation Platform	EC and EEA
CDP – Disclosure Insight Action	CDP
OECD.Stat	OECD
FAOSTAT	FAO
Sustainable Development Goals Indicators	FAO
Agricultural Market Information System	FAO
Food and Agriculture Microdata Catalogue	FAO
UNdata	United Nations Statistics Division
SDG Indicators Database	United Nations Statistics Division

The datasets that these data platforms provide are different in terms of spatial and temporal resolution and thus not all of them are appropriate for answering particular questions. An overview of the spatial and temporal resolution of Pan-European statistics and their links to individual levels of the eLTER organisation is provided in Figure 4, for individual datasets they are specified in Annex 3.

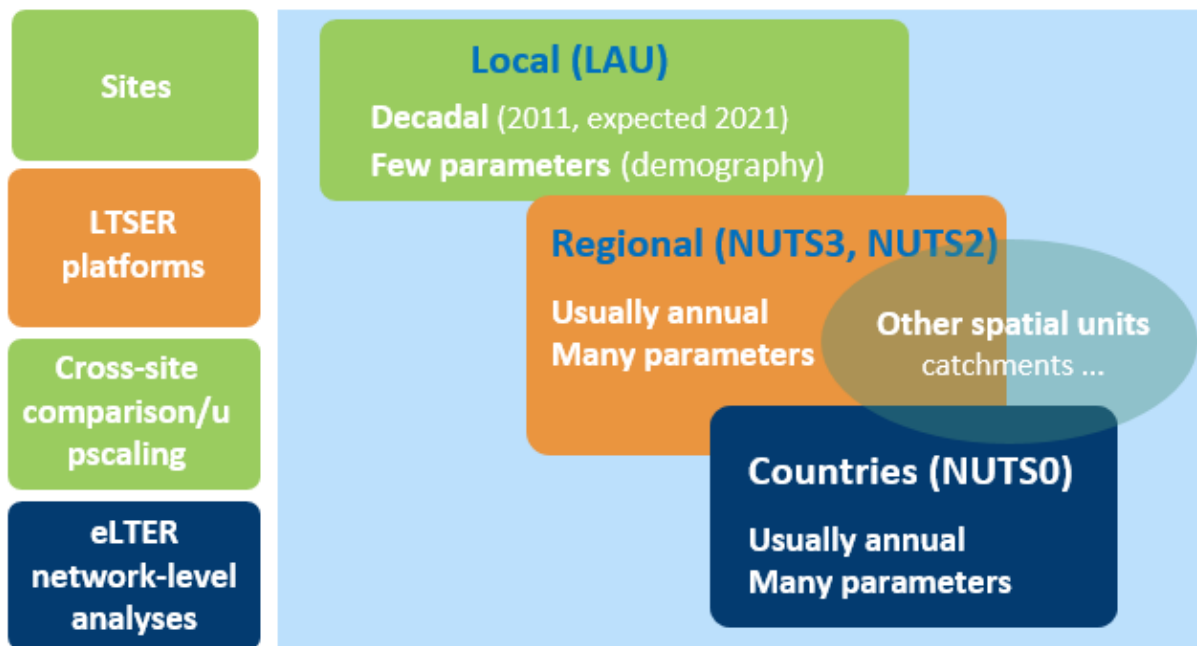


Figure 4: Spatial and temporal resolution of pan-European statistics

4.2 Data sources at national level

Data collected by National Statistical Offices represent another source of datasets that are useful for eLTER activities. They have some advantages for some research questions; the main advantage is that for some variables national statistical agencies collect data at more detailed spatial resolution than those provided by European statistical agencies. Sometimes the data are collected with higher frequency and usually they are provided on a more timely basis than comparable data in European official statistics. In some countries there is a longer history of official statistical data collection and thus individual datasets may have longer temporal coverage than European datasets. An additional advantage is that countries provide some variables to European statistics (mostly to Eurostat) and therefore these data are prepared in a harmonised and standardised way. The main disadvantage is that national statistics are dispersed and they are often documented in national languages, which makes it more difficult to use them for cross-country analyses. The links to individual national statistical offices are listed in table 7 and can be found in the web site: <https://ec.europa.eu/eurostat/web/links>.

Table 7: Links to national statistical offices

Country	Statistical office name	Link
Austria	Statistik Austria	http://www.statistik.at/web_de/statistiken/index.html
Belgium	STATBEL	https://statbel.fgov.be/
Bulgaria	National Statistical Institute	https://www.nsi.bg/
Croatia	Državni zavod za statistiku	https://www.dzs.hr/default.htm
Czech Republic	Český statistický úřad	https://www.czso.cz/csu/czso/domov
Cyprus	Statistical Service	https://www.cystat.gov.cy/el/default?OpenDocument
Denmark	Danmarks Statistik	https://www.dst.dk/en/
Estonia	Statistics Estonia	https://www.stat.ee/

Country	Statistical office name	Link
Finland	Statistics Finland	https://www.stat.fi/
France	Institut national de la statistique et des études économiques	https://www.insee.fr/fr/accueil
Germany	DESTATIS Statistischer Bundesamt	https://www.destatis.de/DE/Home/_inhalt.html
Greece	Hellenic Statistical Authority	https://www.statistics.gr/en/home/
Hungary	Hungarian Central Statistical Office	https://www.ksh.hu/?lang=en
Ireland	Central Statistics Office	https://www.cso.ie/en/
Italy	Istituto Nazionale di Statistica	https://www.istat.it/
Latvia	Central statistikas parvalde	https://www.csb.gov.lv/en/sakums
Lithuania	Lietuvos statistika	https://www.stat.gov.lt/home
Luxembourg	STATEC	https://statistiques.public.lu/fr/acteurs/statec/index.html
Malta	National Statistics Office	https://nso.gov.mt/en/Pages/NSO-Home.aspx
Netherlands	Centraal Bureau voor de Statistiek	https://www.cbs.nl/
Poland	Statistics Poland	https://stat.gov.pl/en/
Portugal	Instituto Nacional de Estatística	https://www.ine.pt/xportal/xmain?xpgid=ine_main&xpid=INE
Romania	Institutul National de Statistica	https://insse.ro/cms/
Slovakia	Statistical Office of the Slovak Republic	https://slovak.statistics.sk/
Slovenia	Statistical Office of the Republic of Slovenia	https://www.stat.si/statweb
Spain	Instituto Nacional de Estadística	https://www.ine.es/
Sweden	Statistics Sweden (SCB)	https://www.scb.se/en/
United Kingdom	Office for National Statistics (ONS)	https://www.ons.gov.uk/
Scotland	Statistics and research	https://www.gov.scot/about/how-government-is-run/statistics-and-research/
Iceland	Statistics Iceland	https://www.statice.is/
Liechtenstein	Office of Statistics	https://www.llv.li/inhalt/11480/amtsstellen/amt-fur-statistik
Norway	Statistics Norway	https://www.ssb.no/
Switzerland	Bundesamt für Statistik	https://www.bfs.admin.ch/bfs/en/home.html
Albania	Institute of Statistics (INSTAT)	http://www.instat.gov.al/al/home.aspx
Montenegro	Statistical Office of Montenegro (MONSTAT)	http://www.monstat.org/cg/
North Macedonia	State Statistical Office	http://www.stat.gov.mk/Default_en.aspx
Serbia	Statistical Office of the Republic of Serbia	https://www.stat.gov.rs/en-US/
Bosnia and Herzegovina	Agency for Statistics of Bosnia and Herzegovina (BHAS)	https://bhas.gov.ba/
Kosovo	Kosovo Agency of Statistics	https://ask.rks-gov.net/
Israel	Central Bureau of Statistics	www.cbs.gov.il
Turkey	Turkish Statistical Institute	https://www.turkstat.gov.tr

5. Workflow for retrieval and harmonisation of data from official statistics

Initial discussion suggested a conceptual framework of data workflow and processing for the eLTER community while simultaneously offering a service to the wider European research community (Fig 5). This conceptual framework was developed during a pilot phase (section 5.1) and the main lessons learned were used to improve our workflow for retrieval and harmonisation of data from official statistics described in section 5.2.

Conceptually, we considered that data needs usually arise from questions formulated directly by research activities at a specific eLTER site or platform (site- or platform-specific research questions) or at several sites across the eLTER network or entire network (network-level questions). In response to these data needs, the relevant data portals require screening and the respective datasets need to be identified. Having standard variables defined in advance (e.g., as defined in WP3), it is possible to identify the relevant datasets in advance as well. The metadata describing these datasets must be stored and accessible to users in a user-friendly way. For this purpose, eLTER is building an eLTER Digital Asset Registry (WP11) that enables easy search for required data.

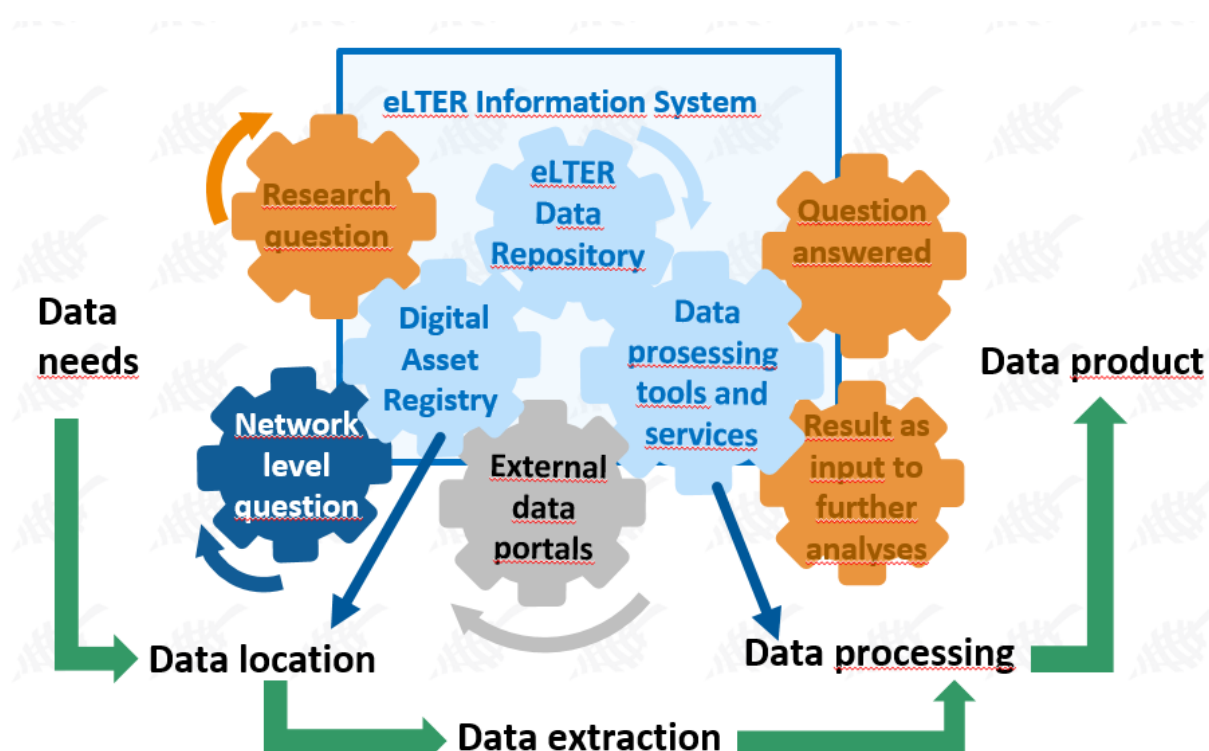


Figure 5: Foreseen functioning of eLTER Information System components relevant for statistical data product preparation

Once the required dataset is identified, the next step in the conceptual workflow is to make data available for further processing and analysis. Two different starting points for data access were recognised:

- (i) Using data, downloaded from a source and stored in a dedicated eLTER server, or
- (ii) Using data directly from an external data portal e.g., for data portals with Application Programming Interface (API) access.

The former option is suitable for datasets that either are not updated anymore or are updated, but the user requires a non-updated version fixed at one point in time. This option is suitable also if data are needed in a different form or format than the original data source offers, i.e., data that requires pre-processing. The latter option is suitable for data that are regularly updated (access to the most recent data required) and pre-processing is not needed. This option is preferred also for comprehensive datasets offering different export settings - in such a case it is better for the user to select a suitable combination of output criteria according to his needs.

The next step in the conceptual workflow deals with data processing. At this point, our workflow has to include a range of tools and services available for the user. These tools and services would be applied either upon user selection or automatically, depending on the nature of the data. Their application should result in the requested data product matching the user requirements to allow answering the question and could serve as input for further analysis. The data product delivered could be in different forms, including data files, graphs or maps. The above-mentioned eLTER Data Repository, Digital Asset Registry, Data processing tools and services, as well as interfaces to external data portals are part of the eLTER Information System and they will be accessible to users through the eLTER Data Integration Portal (DIP).

The conceptual workflow was tested using the six LTSER platforms agreed in Task 4.5 – “LTSER pilot data provisioning – utilising RI expertise for spatially-explicit socio-ecological data provision to platforms as the pilot”. These platforms include:

- LTSER Zone Atelier Alpes (France)
- LTSER Platform Eisenwurzen (Austria)
- Braila Islands (Romania)
- Cairngorms National Park LTSER (United Kingdom)
- Doñana Long-Term Socio-ecological Research Platform (Spain)
- Trnava LTSER Platform (Slovakia).

5.1 Pilot phase

The eLTER DataLabs developed in WP11 was used for pre-processing the data (for more details see Annex 4 and <https://datalab.datalabs.ceh.ac.uk/projects/elter/info>). It was recognised that all official statistical datasets required clipping to the area of relevance or region of interest (ROI), commonly the site or platform boundary. Two common data types were found: (i) tabular statistical data, e.g., Eurostat data such as population density per NUTS or LAU, and (ii) gridded or raster data, for example EU Copernicus Land Cover data (CORINE Land Cover). The latter requires clipping to the desired research area but no further processing, while for the former, only a proportion of the NUTS or LAU area may be relevant for the site or platform, i.e., the boundaries defining a NUTS region most often does not match the boundary of the site or platform. We found it useful to test the use of gridded (raster) data in the pilot phase, although they are not the primary subject of T4.2. However, the ability to clip raster files will be later required in tasks 4.3, 4.4, and 4.5.

For this pilot phase we selected one example of the gridded/raster type (land cover) and three variables of the tabular type, including population density, employment by sectors, and deaths due to COVID-19. The first three variables were selected because of their high relevance for eLTER sites and platforms, the COVID variable was used due to actual health situation in time of pilot phase and possible consequences of pandemic to land use in and around eLTER sites and platforms.

Data sources for these variables were identified. The raster data source was the European Union's Earth observation programme Copernicus, namely the Copernicus Land Monitoring Service (<https://land.copernicus.eu/>; MMU 25 ha). Equivalent national scale data (the UKCEH Land Cover

Maps - LCMs; 25 m x 25 m) was also used as a further test of the workflow. The tabular data was sourced from EUROSTAT – Regional statistics for population density and employment by sectors, and from European Centre for Disease Prevention and Control for COVID data. The spatial resolution, temporal resolution, and period of data availability differed for individual datasets. The **population density** was available for NUTS1, NUTS2, and NUTS3 regions and they covered the period of 1990-2018 with annual frequency.

The **employment by sectors** was available for NUTS1 and NUTS2 regions for years 1999-2019 with annual periodicity. However, the Statistical classification of economic activities in the European Community (NACE) was revised in 2006 and provided in 2008 in revised classification (NACE Rev. 2). Therefore, for this variable there are two different data sets available – one for the years 1999-2008 and one for 2008-2019. For 2008 data are in both classifications.

Available data on **diseases due to the virus COVID-19** have spatial resolution of countries and they are available since 1 January 2020 with daily frequency. Both cases and deaths are reported.

These three datasets highlighted the issues that

- spatial resolution of EUROSTAT data for all eLTER sites and platforms is non-standard as the area of land within NUTS levels varies substantially between countries
- the revision of classifications in the data held in different years (such as the mentioned one for NACE classification of the economic activity) is potentially problematic in case of temporal analysis and
- EUROSTAT is reliant on country submissions and there can be temporal delays in countries submitting data to the central service.

We downloaded the requested data for all four variables and stored them on an eLTER server. In the next step, the data were processed in the DataLabs environment. The cookie-cutting or clipping application was used for selection of data from European datasets for the region of interest – in this pilot phase we used the LTSEr platforms agreed in WP4.5 as target territories. Using DataLabs we prepared outputs in the form of comma-separated files (CSV) files, graphs and maps. We also tested the procedure described using national data products for gridded or raster data. In dedicated virtual

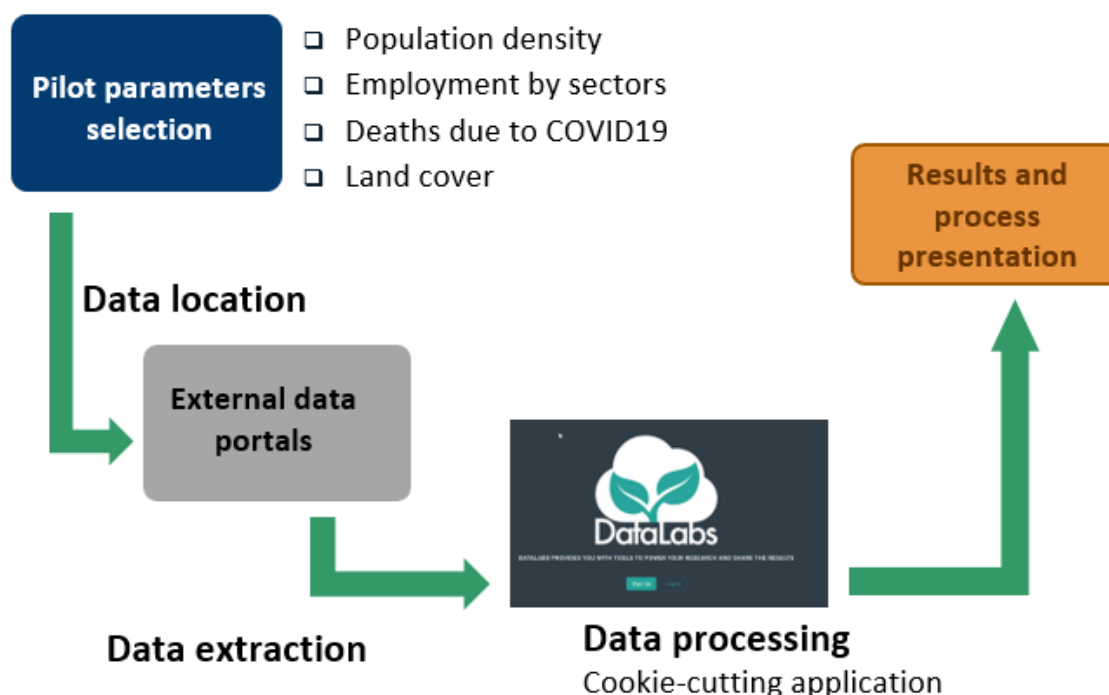


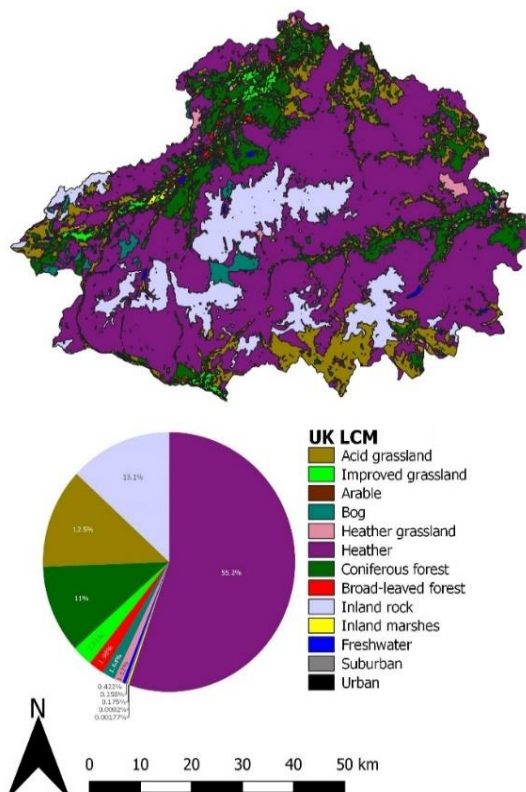
Figure 6: The workflow used in the pilot phase

workshops during the development process we presented preliminary results to 19 targeted eLTER consortium members (Annex 4) and presented the work to the eLTER community in the eLTER PLUS consortium meeting (Venus conference in April 2021).

In principle, we can consider the workflow used in the pilot phase (see Figure 6) as a simple template procedure corresponding to expected functioning of the eLTER Information System. Analysis revealed that the proposed workflow functioned well, but the relevance of the data sets delivered depended on the research question asked. This issue will be explored more fully in Task 4.5, here we present the findings of our small pilot test. For example, when the workflow was followed for the European data source of land cover data (CORINE Land Cover - CLC) and compared with the national data source for the UK (UK Land cover data product) the data delivered was accurate for both data sets. However, because the input data was different in terms of spatial resolution and land cover categorisation, the resultant maps differed. Thus, the researcher may wish to use the national dataset for some questions but may prefer the CLC data product if comparing between European LTSEr platforms, because the CLC data is harmonised across the continent (this will be explored further in Task 4.5). This test showed that the piloted workflow was useful for both European and national gridded/raster data sets (Figure 7).

An additional step was required when using tabular data as the region of interest seldom, if ever, exactly matched the area that the data represented (i.e., NUTS or LAU area). As stated earlier, European tabular data is maintained at the scale of NUTS or LAU but a similar approach is used for all national official statistics (commonly administrative units).

(a) UK Land cover data
25m x 25m



(b) CORINE Land Cover
25 ha min 100 m width

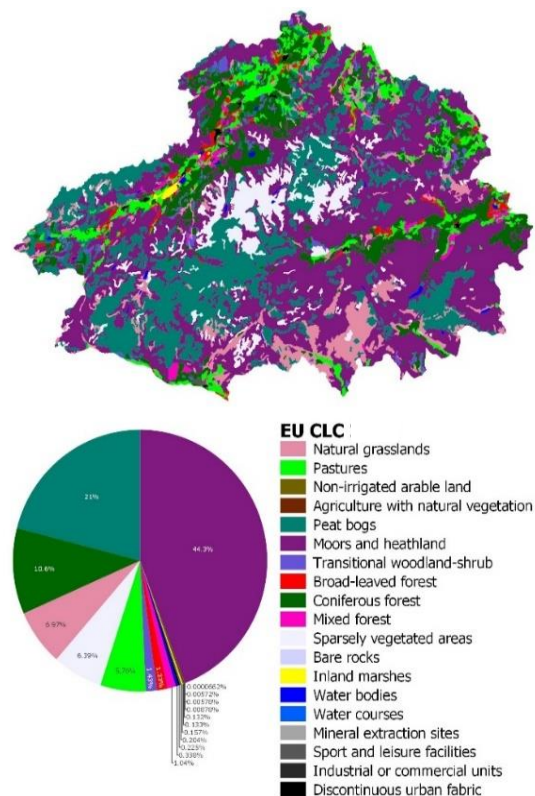


Figure 7: Output from the proposed workflow for Cairngorms LTSE platform using (a) UK national and (b) CORINE land cover data products

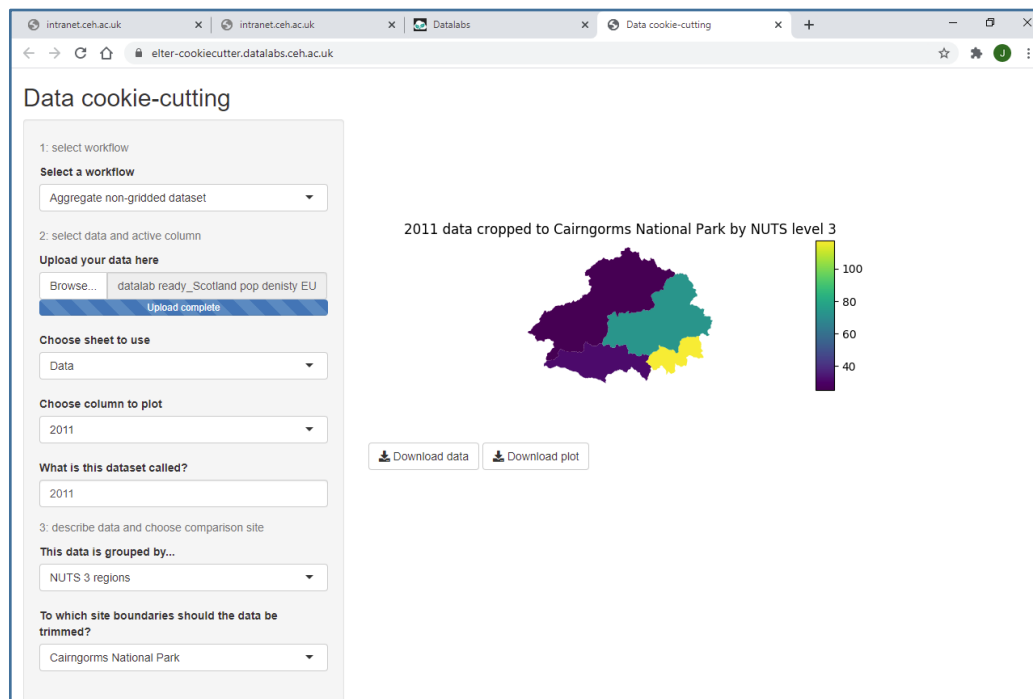


Figure 8 Screenshot of the DataLabs showing EUROSTAT Population Density data for the Cairngorms LTSE platform (UK)

The cookie-cutting or clipping in DataLabs therefore incorporated an additional calculation to estimate the proportion of NUTS or LAU area inside the region of interest. The Cairngorms LTSE is used here as an example (Figure 8). The Cairngorms LTSE encompasses parts of four NUTS 3 areas each with a different proportion of the NUTS 3 area (Table 8).

Table 8 Population density for the four NUTS3 regions in 2011 and 2018 and the proportion of the NUTS region within the Cairngorms LTSE

Zone_id	Zone_name	Area ratio within LTSE	Population density 2011 (per km ²)	Population density 2018 (per km ²)	Increase in population density
UKM77	Perth & Kinross and Stirling	0.094	31.7	33.0	1.3
UKM71	Angus and Dundee City	0.146	117.4	118.4	1.0
UKM50	Aberdeen City and Aberdeenshire	0.222	73.2	76.2	3.0
UKM62	Inverness & Nairn and Moray, Badenoch & Strathspey	0.256	25.3	26.1	0.8

The DataLabs provides the user with the knowledge that there is a different proportion of the NUTS region within the platform (9.4%, 14.6%, 22.2% and 25.6% for the 4 NUTS3 regions of the Cairngorms LTSE Table 8). Therefore, using the area ratio it is possible to calculate the population density within the border of the LTSE platform. However, the workflow process will enable other alternative calculations if required. For example, the Cairngorms LTSE has a large uninhabited area in the centre (i.e. population not spread evenly across the area), so it is suggested from this pilot to enable a further calculation that will allow a more defined region of interest, i.e. to exclude the area where no one lives in the mountain areas. This test also highlighted that the area of individual LTSE platforms represent

different proportion of the total area of the respective NUTS3 region (Table 9, last column). This has consequence to data relevance for a LTSEr platform and the precision of data between platforms – if this proportion is low, and the data is not homogeneously spread across the surface area of the LTSEr platform, it may not reflect well the situation within the boundary of the LTSEr platform. The DataLabs will enable a wide range of calculations. For example, if the data is available at a higher spatial resolution. It may be possible to calculate population density for all spatial units with a centroid inside the boundary of the LTSEr platform, or if density of livestock is required, the area ratio of pasture maybe a more appropriate denominator than all land area. Further testing of the workflow presented here is currently being conducted in task 4.5.

Table 9. Six pilot LTSEr platforms used to test the workflow

LTSEr Platform		NUTS3 regions*		LTSEr Platform/NUTS 3 region ratio
Name and country	Area (km ²)	Number	Total area km ²)	
LTSEr Zone Atelier Alpes – France	40,446	12	86,825	46.6%
LTSEr Platform Eisenwurzen (EW) – Austria	5,908	10	24,870	23.8%
Braila Islands - Romania	2,596	4	24,776	10.5%
Cairngorms National Park LTSEr - United Kingdom	4,531	4	24,351	18.6%
Doñana Long-Term Socio-ecological Research Platform - Spain	2,732	3	31,602	8.6%
Trnava LTSEr - Slovakia	364	2	6,197	5.9%

* Wholly or partially within the LTSEr

This pilot demonstrated that the proposed workflow is capable of retrieving and harmonising data drawn from official statistics according to the queries of users. This enables formulation of full workflow for retrieval and harmonisation of data from official statistics (section 5.2).

The pilot phase provided the following lessons regarding the workflow:

- Need to define area of interest depending on the research question
- Simple clipping is sufficient for raster/gridded data, and
- Calculation to identify the proportion of the tabular data relevant to the region of interest depends on the research question but the DataLabs approach will enable complex calculations and appears robust and sufficient for the task.

5.2 Workflow proposal

The workflow used in the pilot phase was found to be functional and useful, but it used only one approach: data download and storage on an eLTER server. The automated retrieval of requested data directly from the provider's portal has not yet been fully tested. However, no technical problems are anticipated. In addition, in the pilot phase we used a stand-alone process, while it is expected that the workflows for official statistical datasets retrieval will form part of the overall system of eLTER RI data handling and processing. They should be tested within the DataLabs of eLTER PLUS WP11 and incorporated to the eLTER Information System. Therefore, further development of our pilot approach was needed and more customised and complex workflows proposed according to the conclusions from the pilot phase. An assessment on the usefulness of the results will be carried out with the feedback from stakeholders (end-users) and provided as a deliverable from task 4.5.

We decided to propose two branches of the workflow; one for tabular data (databases) and one for spatial data (gridded/raster). Both branches provide input to DataLabs where the final data processing and output production are performed. The workflow is schematically presented in Figure 9.

The **statistical data branch** starts with **specification of needed variable(s)**. Currently, we work with variables specified in the Discussion paper on eLTER Standard Observations (eLTER PLUS deliverable 3.1; Zacharias et al., 2021), but further variables could be considered in the future, if needed.

The workflow continues with the **data source identification**. In harmony with previous work, we prefer to use Eurostat as the priority data source for European wide data. Other sources should be investigated, especially if Eurostat does not provide the required variable or if the spatial, temporal, or thematic resolution is not suitable.

When the data source is identified, it is critical to **prepare metadata** that describe the data source and dataset to enable the workflow standardization and to allow replication of the work in the future. We recommend including the metadata information specified in table 10. The metadata structure could be changed based on further development in eLTER PLUS work packages 10 and 11. Metadata will be used for the dataset registration in the eLTER Digital Asset Registry. Currently we refer in metadata to the Task 4.5 code of the respective variable as a reference for future implementations.

Table 10: Structure of metadata used for datasets description in this report (Annex 3)

Field name	Explanation
eLTER Variable name	Variable name as used in eLTER Standard observations
eLTER variable Code	Variable code as specified in Annex 1 of this report
Task 4.5 code	Variable code as used in selection of variables for task 4.5
Sub-variable name	Sub-variable name, if relevant
Description	Dataset description
Data provider	Name of data provider
URL	Link to the web page with data
API link	Link to provider's API, if available
Dataset name	Dataset name in the provider's portal
File name original/online data code	Name of file in the provider's portal and/or online data code / persistent object identifier (e.g. DOI)
Unit	Measurement unit
Spatial resolution	Usually NUTS regions or local administrative units (LAU)
Temporal resolution	Time frequency of data
Temporal coverage	Year or day of first and last data available
T4_2 file name	Name of the file in the eLTER Data Repository
Export settings	Specification of options for data export – this could include time, spatial unit and other categories selection
Note	Additional information on the dataset

The next step in the workflow is the **data retrieval**. Here two possible methods can be used, depending on whether an Application Programming Interface (API) is available or not. If the API is not available, data are selected, downloaded, and stored on an eLTER server. This is identical to the workflow used in the pilot phase when we downloaded and stored data in both csv and Excel (xlsx) formats. If an API is available, then up-to-date data can be retrieved on demand. *For each data source/API*, this requires roughly a day's work to build and test code to retrieve data with minimal user input. The results of this workflow step are data ready for analysis in DataLabs.

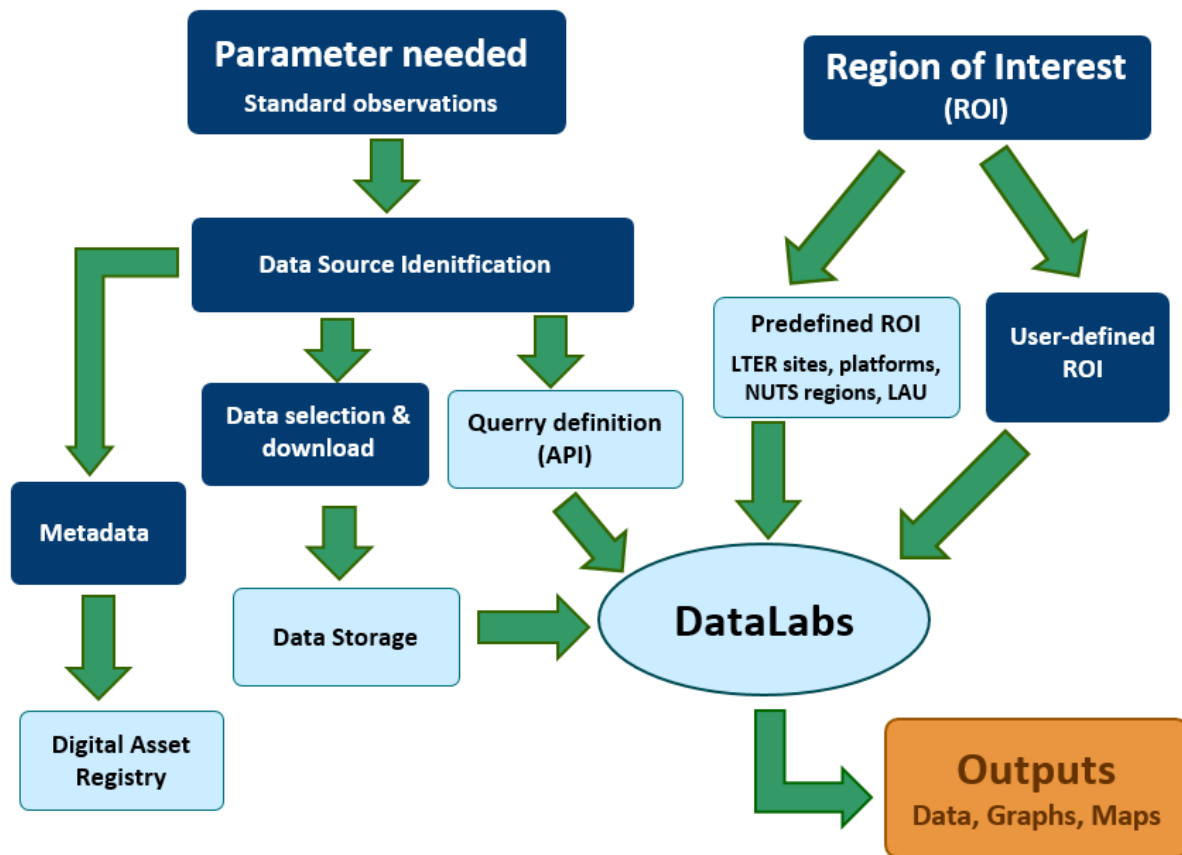


Figure 9: Proposed workflow for the statistical data retrieval

Light blue elements represent components of the eLTER Information System.

The second branch of the workflow is related to spatial definition of the Region of Interest. By definition, the Region of Interest (ROI) is a subset of an image or a dataset identified for a particular purpose. In our case, ROI is an area for which the statistical analysis is performed and in this part of workflow, boundaries of ROI should be defined. There are two possibilities to define the ROI: **predefined ROI** or **user-defined ROI**. For predefined ROIs, the user can select some standard spatial units. For official statistical data, standard ROI's are the most commonly relevant administrative units, especially NUTS system (Eurostat, 2020) and Local Administrative Units (LAU). Aside from administrative units, other spatial units could be used – e.g., watersheds, LTER sites of LTER platforms. User-defined ROI allows the users to provide and use their own ROI relevant for their research question. For example, it is possible to exclude the non-inhabited area such as a large lake or mountain if calculating population density. Currently, the DEIMS-SDR provides the boundaries of eLTER sites and platforms (in shapefile format). DEIMS-SDR (Dynamic Ecological Information Management System - Site and Dataset Registry) is eLTER's information management system that allows users to discover long-term ecosystem research sites and platforms around the globe, along with the data gathered at those sites and platforms and the people and networks associated with them (<https://deims.org/about>). It is proposed that DEIMS-SDR will be modified to enable storage of additional geospatial files relevant to the site or platform, i.e., done via the observation locations (e.g. watershed of Rosalia Lehrforst, <https://deims.org/locations/a1ac8bdb-a1b4-4b9f-811a-dc5f9969351a>) which could be used to extend the cookie-cutter workflows.

The last phase in the workflow represents **data analysis and output preparation**. Selected spatial data can be cropped to the boundaries of a specific ROI. This is set by default for user-selected site boundaries/locations from the DEIMS-SDR platform – any site can be selected and information is kept up-to-date via the DEIMS-SDR API.

Currently, tabular data is aggregated by matching observations to administrative units falling within the boundaries of a ROI. These observations are returned as-is (i.e. unaltered) along with spatial metadata to quantify their relevance. Currently the spatial relevance of area within the boundary i.e., ‘area ratio’ (see below) although other possibilities will be explored under task 4.5, and WP8 and 9.

$$\text{area ratio} = \frac{\text{area of unit falling within region of interest}}{\text{total area of unit}}$$

Output data is saved and stored in the DataLabs for further processing and export as required.

All data processing and analyses are carried out in the DataLabs, a cloud-based platform which provides storage and computing resources via “notebooks” (shared code execution spaces) and “sites” (hosted applications based on notebook code). The pilot workflow is implemented as a site coded in R Shiny and Python. The code is hosted on Github here: <https://github.com/eLTER-RI/spatial-data-processor>. A guide is accessible from the same website, the direct address is: <https://github.com/eLTER-RI/spatial-data-processor/blob/master/documentation/tutorials/user-introduction.md>. As this work is constantly being updated and improved the reader is referred to the Github site.

The proposed workflows are linked to several parts of the eLTER Information System as described in Figure 5. Based on the (research) question, users can select relevant dataset in the *Digital Asset Registry* that is then extracted from *eLTER Data Repository* or provided from external data portal and processed by *eLTER Data processing tools and services*. The result is a data product that either answers the user’s question or represents input to further analysis.

6. Conclusions

The aim of this task was to develop and test a workflow to retrieve available variables relevant for the eLTER Standard Observations from European and national statistics. We based our work on variables, identified in the *Discussion paper on key standard observation variables* (Zacharias et al. 2021; eLTER PLUS deliverable D3.1). From 179 variables listed in the deliverable D3.1 we identified 50 variables as relevant or probably relevant for this task (relevant = accessible from existing databases). We developed the workflow and tested it using four pilot variables. Based on results and including the feedback from the online workshop and presentation to the eLTER PLUS community, we proposed final workflows to retrieve official statistical data for the research needs of the eLTER community.

We also screened web portals of main European wide data providers of statistical data for availability of data related to individual variables relevant for Standard Observations. Then we defined metadata for relevant datasets and downloaded the datasets for some variables. We focused on statistical data, but in some cases we used gridded data as well, despite this option is beyond the scope of task T4.2.

The outcomes of T4.2 described in this report and its Annexes will serve as direct input to building of some components of the eLTER Information System. The metadata on datasets described in Annex 3 will serve as input to building the Digital Assets Registry. The update of Standard Observation variables will continue and the list of variables may change in the future, which will feed the loop to identify the best data sources for such additional variables. Regarding this expected further implementation it will be a useful description of individual data providers, data portals and indicators that is provided in Annex 2 of this report.

7. References consulted

- Dick, J., Halada, L., 2020: Rapid assessment of CLEVER Cities project list of EU data platforms from perspective of eLTER. – eLTER PLUS, H2020 grant no. 871128, 5 pp.
- Dick, J., Orenstein, D., Gaube, V., Méndez, P., Díaz-Delgado, R., Bretagnolle, V., Cristian Adamescu, N., Parland-Vonessen, J., Halada, L., Bown, M., Peterseil, J., 2020: Socio-ecological data needs in eLTER PLUS, State-of-knowledge – Report 1 Pre-kick-off meeting March 2020. eLTER PLUS, H2020 grant no. 871128 eLTER PLUS, H2020 grant no. 871128, 10 pp.
- Dorren, L.K.A., Berger, F., Imeson, A.C., Maier, B., Rey, F., 2004: Integrity, stability and management of protection forests in the European Alps. - *Forest Ecology and Management* 195: 165–176. doi:10.1016/j.foreco.2004.02.057
- Eurostat, 2020: Statistical regions in the European Union and partner countries. NUTS and statistical regions 2021 - Luxembourg: Publications Office of the European Union, 181 pp.
- Haase, P., Tonkin, J.D., Stoll, S., Burkhard, B., Frenzel, M., Geijzendorffer, I.R., Häuser, Ch., Klotz, S., Kühn, I., McDowell, W.H., Mirtl, M., Müller, F., Musche, M., Penner, J., Zacharias, S., Schmeller, D.S., 2018: The next generation of site-based long-term ecological monitoring: Linking essential biodiversity variables and ecosystem integrity. – *Science of Total Environment* 613-614: 1376-1384 <https://doi.org/10.1016/j.scitotenv.2017.08.111>
- Littkopf, A., Haubold, H., 2018: Guidance on how to utilize available EU data platforms to support local processes. - Deliverable 1.1.7, CLEVER Cities, H2020 grant no. 776604, 58 pp.
- Mollenhauer, H., Kasner, M., Haase, P., Peterseil, J., Wohner, Ch., Frenzel, M., Mirtl, M., Schima, R., Bumberger, J., Zacharias, S., 2018: Long-term environmental monitoring infrastructures in Europe: observations, measurements, scales, and socio-ecological representativeness. - *Science Total Environ.* 624: 968-978.
- Zacharias, S., Anttila, S., Bäck, J., Böttcher, K., Mallast, U., Mirtl, M., Schaub, M., Trotsiuk, V. (eds.), 2021: Discussion paper on eLTER Standard Observations (eLTER SOs). – Deliverable D3.1. EU Horizon 2020 eLTER PLUS Project, Grant agreement No. 871128, 40 pp.

Electronic sources

UNSD 2021: <https://unstats.un.org/unsd/goodprac/bpaboutpr.asp?RecId=1>

8. Abbreviations and glossary

- API** - Application Programming Interface. Software intermediary that allows two applications to talk to each other. API is an interface that provides programmatic access to service functionality and data within an application or a database.
- CLC** - CORINE Land Cover. The CLC inventory was initiated in 1985 (reference year 1990) to standardize data collection on land in Europe to support environmental policy development. Updates were produced in 2000, 2006, 2012 and 2018.
- COPERNICUS** - European Union's Earth observation programme. European system for monitoring the Earth consisting of a complex set of systems which collect data from multiple sources. It offers information services that draw from satellite Earth Observation and in-situ (non-space) data.
- CORINE** - COOrdination of INformation on the Environment. European programme initiated in 1985 by the European Commission, aimed at gathering information relating to the environment on certain priority topics for the European Union (air, water, soil, land cover, coastal erosion, biotopes, etc.). Since 1994, the European Environment Agency (EEA) integrated CORINE in its work programme.
- CS** - Case Studies of eLTER PLUS project.

- csv** – a delimited text file that uses a comma to separate values - comma-separated values (csv)
- COVID-19** - an infectious disease caused by the coronavirus SARS-CoV-2.
- DataLabs** - a cloud-based platform which provides storage and computing resources via “notebooks” (shared code execution spaces) and “sites” (hosted applications based on notebook code). The pilot workflow is implemented as a site coded in R Shiny and Python
- DEIMS-SDR** - Dynamic Ecological Information Management System - Site and Dataset Registry. Information management system that allows you to discover long-term ecosystem research sites around the globe, along with the data gathered at those sites and the people and networks associated with them.
- DEIMS.id** - an identifier for site registered in DEIMS-SDR.
- DG AGRI** - Directorate-General for Agriculture and Rural Development. The DG AGRI is responsible for the European Union policy area of agriculture and rural development.
- DIP** – Data Integration Portal. eLTER Data Integration Portal, providing interoperable data from different data nodes
- DOI** - Digital Object Identifier. Globally unique character strings that reference physical, digital, or abstract objects. They provide actionable, interoperable, persistent links to information about the objects they reference.
- Ecosystem integrity** - the system’s capacity to maintain structure and ecosystem functions using processes and elements characteristic for its ecoregion (Dorren et al., 2004; Haase et al., 2018).
- EEA** – European Environment Agency. The European Union agency tasked with providing sound, independent information on the environment.
- EEV** – Essential Environmental Variables
- EFI** - an international organisation established by European States. EFI conduct research and provide policy support on forest-related issues, connecting knowledge to action.
- eLTER** - Integrated European Long-Term Ecosystem, critical zone and socio-ecological Research infrastructure.
- eLTER Information Clusters** – all data from eLTER Sites
- eLTER Information System (eLTER IS)** – the site registration service (DEIMS-SDR), the central data service: eLTER Central Data Node (CDN) and the discovery service eLTER Data Integration Portal (DIP)
- eLTER PLUS** – European long-term ecosystem, critical zone and socio-ecological systems research infrastructure PLUS. Horizon 2020 project No. 871128, H2020 – INFRAIA-2019-1.
- eLTER Site** – Category of the eLTER RI distributed *in situ* component (comprising Master Sites, Regular Sites and Satellite Sites)
- eLTER Standard Observations** – will include the minimum set of variables as well as the associated method protocols that can characterize adequately the state and future trends of the Earth systems.
- eLTER Platform** – Category of the eLTER RI distributed *in situ* component dedicated to Long-Term Socio-Ecological Research on human-environment interactions at the regional/landscape scale
- Eurostat** – Eurostat is the statistical office of the European Union. Eurostat produces European statistics in partnership with National Statistical Institutes and other national authorities in the EU Member States.
- FAO** – The Food and Agriculture Organization. Specialized agency of the United Nations that leads international efforts to defeat hunger.
- GIS** - Geographic Information System. System that creates, manages, analyses, and maps all types of data. GIS connects data to a map, integrating location data (where things are) with all types of descriptive information (what things are like there). This provides a foundation for mapping and analysis that is used in science and almost every industry.
- GitHub** - GitHub, Inc. is a provider of Internet hosting for software development and version control using Git. It offers the distributed version control and source code management (SCM) functionality of Git, plus its own features. Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

ILTER – International Long Term Ecological Research network.

ICT – Information and Communications Technology.

JRC – Joint Research Centre. European Commission's science and knowledge service. JRC supports EU policies with independent scientific evidence throughout the whole policy cycle.

LAU – Local Administrative Units. LAU are used to divide up the territory of the EU for the purpose of providing statistics at a local level. They are low level administrative divisions of a country below that of a province, region or state. Not all countries classify their locally governed areas in the same way and LAUs may refer to a range of different administrative units, including municipalities, communes, parishes or wards.

LTER site – see eLTER site

LTSE platform – see eLTSE platform

LUCAS - Land Use and Coverage Area frame Survey. Eurostat has carried out this survey every 3 years since 2006 to identify changes in the European Union in land use and land cover.:

MMU – minimum mapping unit. The specific size of the smallest feature that is being reliably mapped.

NACE - Statistical classification of economic activities in the European Community. NACE is a four-digit classification providing the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics (e.g. production, employment and national accounts) and in other statistical domains developed within the European statistical system (ESS).

NUTS - Nomenclature of Territorial Units for Statistics. NUTS is a hierarchical system for dividing up the economic territory of the EU and the UK for the purpose of: (1) collection, development and harmonisation of European regional statistics, and (2) for socio-economic analyses of the regions.

OECD - The Organisation for Economic Co-operation and Development. OECD is an international organisation that works to build better policies for better lives. Its goal is to shape policies that foster prosperity, equality, opportunity and well-being for all.

RC – Research Challenges of the eLTER PLUS project: RC1 Biodiversity loss; RC2 Biogeochemical controls of ecosystem functions; RC3 Climate-water-food nexus; RC4 Socio-ecological systems

ROI – Region of Interest. A selected subset of samples within a dataset identified for a particular purpose.

RS – Remote Sensing. RS is the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance (typically from satellite or aircraft). Special cameras collect remotely sensed images, which help researchers "sense" things about the Earth.

SDG - Sustainable Development Goals. SDGs are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including poverty, inequality, climate change, environmental degradation, peace and justice.

SEV – Socio-Ecological Variables

shp - shapefile format - a geospatial vector data format for geographic information system (GIS) software

TIF, TIFF - Tagged Image File Format. An image file format for storing raster graphics images, popular among graphic artists, the publishing industry, and photographers.

tsv – Tab-Separated Values. Simple text format for storing data in a tabular structure, e.g., database table or spreadsheet data, and a way of exchanging information between databases.

txt - a file extension for a text file.

URL - Uniform Resource Locator (URL), colloquially termed a web address, is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it.

VA – Virtual Access

WP – work package

xlsx - format for Microsoft Excel documents that was introduced by Microsoft with the release of Microsoft Office 2007.

9. Annexes

Annex 1: List of standard observations and their relevance for T4.2

No	Do-main	Compartment Component	Variable	Statistical data availability
1	AB	Climate	Relative air humidity	Not available
2	AB	Climate	Precipitation	Possibly available
3	AB	Climate	Air temperature	Possibly available
4	AB	Climate	Wind speed / Wind direction	Not available
5	AB	Climate	Surface atmospheric pressure	Not available
6	AB	Soil	Soil inventory	Possibly available
7	AB	Soil	Soil temperature	Not available
8	AB	Soil	Soil organic C content (per horizon)	Possibly available
9	AB	Soil	Soil total N content (per horizon)	Possibly available
10	AB	Soil	Soil total P content (per horizon)	Possibly available
11	AB	Soil	Soil water content	Not available
12	AB	Soil	Soil pH (in H ₂ O/KCl/CaCl ₂)	Possibly available
13	AB	Soil	Soil cation exchange capacity	Not available
14	AB	Soil	Soil base saturation	Not available
15	AB	Streams/Rivers	Stream sinuosity	Not available
16	SE	Population	Population current activity status	Available
17	SE	Population	Population industry	Available
18	SE	Resource use	Time use	Uncertain
19	SE	Agriculture and Forestry	Area under tillage	Available
20	SE	Agriculture and Forestry	Land-based income	Available
21	SE	Agriculture and Forestry	Livestock feed management	Available
22	SE	Agriculture and Forestry	Agricultural products	Available
23	SE	Agriculture and Forestry	Harvest (cropland, grassland, forest) (t/ha)	Available
24	SE	Governance and stakeholders	Governance structure and character	Uncertain
25	SE	Governance and stakeholders	Stakeholder engagement process indicators and profile of engaged stakeholders	Not available
26	SE	Governance and stakeholders	Basic services provision: health & education	Available
27	SE	Land use and land cover change	Land use (historic)	Available
28	SE	Land use and land cover change	Land cover (CORINE)	Available
29	SE	Land use and land cover change	Land use change	Available
30	SE	Land use and land cover change	Land use (Statistics)	Available
31	SE	Land use and land cover change	Land cover (Orthophotos)	Not available
32	SE	Platform characteristics	General information (DEIMS-SDR)	Not available
33	SE	Platform characteristics	Ecosystem services profile	Uncertain
34	SE	Platform characteristics	NUTS3 and Local Administrative Units (LAU) spatial databases	Available

No	Do-main	Compartment Component	Variable	Statistical data availability
35	SE	Platform characteristics	Per capita income / GDP per capita	Available
36	SE	Population	Population age profile	Available
37	SE	Population	Population status of employment	Available
38	SE	Population	Population education attainment	Available
39	SE	Population	Population residential profile/density	Available
40	SE	Resource use	Resource use (biomass, construction, iron/steel, fossil fuels), trade of resources	Available
41	SE	Resource Use	Subsidies programs / schemes	Possibly available
42	SE	Resource use	Population consumption statistics	Available
43	SE	Agriculture and Forestry	Grazing timing, intensity	Possibly available
44	SE	Agriculture and Forestry	Farm gate economic return	Available
45	SE	Agriculture and Forestry	Livestock (livestock units)	Available
46	SE	Agriculture and Forestry	Irrigation management, timing, intensity	Available
47	SE	Agriculture and Forestry	Fertilizer input (N, P, K fertilisation, liming, pesticides)	Available
48	SE	Governance and stakeholders	Sense of Place / Nature connectedness	Not available
49	SE	Governance and stakeholders	Relevant regional actors and initiatives (NGO's, civil society groups, etc.)	Not available
50	SE	Governance and stakeholders	Wellbeing information of population	Possibly available
51	SE	Governance and stakeholders	Property ownership/laws/institutions	Available
52	SE	Land use and land cover change	Land use (Archival cadastral)	Possibly available
53	SE	Platform characteristics	Number of tourists/visitors to protected areas	Possibly available
54	SE	Population	Population occupation	Available
55	SE	Population	Population place of birth	Available
56	SE	Population	Living conditions in dwellings: m2 per person; thermal quality;	Available
57	SE	Resource use	Infrastructure physically and in terms of services available	Possibly available
58	SE	Resource Use	Records of important land users (e.g., forest enterprises)	Possibly available
59	SE	Resource use	Resource use (energy carriers, electricity, biomass, construction, iron/steel, fossil fuels),	Available
60	SE	Transportation and Industry	Mobility information: accessibility indicators, means of transport	Available
61	SE	Transportation and Industry	Mobility: distances travelled (locals vs tourists)	Not available
62	SE	Transportation and Industry	Physical infrastructure networks	Possibly available
63	SE	Transportation and Industry	Buildings and other structures	Possibly available
64	SE	Transportation and Industry	Roads, Railways, settlement areas	Possibly available
65	BH	Lake	Vertical profiles of chl a, pigments	Not available
66	BH	Terrestrial	Flying insects	Not available
67	BH	Terrestrial	Habitat Structure, vegetation/plant phenology based on satellite remote sensing (European extent)	Not available
68	BH	Terrestrial	Birds, bats, frogs, some insects (e.g., grasshoppers) using acoustic recording	Not available
69	BH	Terrestrial	Pollen and spores from air	Not available

No	Do-main	Compartment Component	Variable	Statistical data availability
70	BH	Terrestrial	Ground-dwelling animals	Not available
71	BH	Terrestrial	Plant phenology	Not available
72	BH	Terrestrial/Aquatic	eDNA	Not available
73	BH	Groundwater	Total prokaryotic cell counts (TCC)	Not available
74	BH	Groundwater	Microbial activity (e.g. ATP conc.)	Not available
75	BH	Groundwater	Fecal indicators (E. coli & coliphages)	Not available
76	BH	Groundwater	Groundwater microbial communities	Not available
77	BH	Groundwater	Groundwater fauna	Not available
78	BH	Lake	Algal community (quantitative)	Not available
79	BH	Lake	Zooplankton (quantitative)	Not available
80	BH	Lake	Fish community (quantitative)	Not available
81	BH	Lake	Macrophyte community (quantitative)	Not available
82	BH	Streams/Rivers	Chl a (benthic, pelagic)	Not available
83	BH	Streams/Rivers	Fish community (quantitative)	Not available
84	BH	Streams/Rivers	Algal community (quantitative)	Not available
85	BH	Streams/Rivers	Macroinvertebrate community (quantitative)	Not available
86	BH	Streams/Rivers	Macrophyte community (quantitative)	Not available
87	BH	Terrestrial	Mammals	Not available
88	BH	Terrestrial	Habitat structure, vascular plants, lichens, mosses/vegetation based on UAV remote sensing (local)	Not available
89	EB	Biomass	Aboveground biomass	Not available
90	EB	Biomass	Leaf area Index (LAI)	Not available
91	EB	Biomass	Net primary production (dendrometer)	Not available
92	EB	Radiation Budget	PAR	Not available
93	EB	Radiation Budget	Global solar radiation (direct shortwave incoming and diffuse radiation)	Possibly available
94	EB	Biomass	Net primary production (EC-Station)	Not available
95	EB	Biomass	Gross primary production	Not available
96	EB	Biomass	Transpiration	Not available
97	EB	Radiation Budget	Ground heat flux	Not available
98	EB	Radiation Budget	Latent heat flux	Not available
99	EB	Radiation Budget	Sensible heat flux	Not available
100	EB	Radiation Budget	Direct incoming shortwave radiation (direct solar irradiance, direct solar radiation)	Not available
101	EB	Radiation Budget	Reflected shortwave radiation	Not available
102	EB	Radiation Budget	Diffused long-wave radiation from the sky	Not available
103	EB	Radiation Budget	Diffused long-wave radiation from the surface	Not available
104	EB	Net Ecosystem Exchange (NEE)	H2O concentration	Not available
105	EB	Net Ecosystem Exchange (NEE)	H2O flux	Not available
106	WB	Groundwater	Groundwater level	Not available
107	WB	Groundwater	water temperature	Not available
108	WB	Groundwater	Spring Discharge	Not available
109	WB	Lake	Water level	Not available
110	WB	Lake	Water temperature	Not available
111	WB	Lake	Inflow/outflow	Not available
112	WB	Lake	Ice cover	Not available

No	Do-main	Compartment Component	Variable	Statistical data availability
113	WB	Soil	Soil water content	Not available
114	WB	Streams/Rivers	Discharge	Possibly available
115	WB	Streams/Rivers	Mean water depth	Not available
116	WB	Streams/Rivers	Water temperature	Not available
117	WB	Streams/Rivers	Bed and water level slope	Not available
118	WB	Streams/Rivers	Instream habitat distribution (incl. sediment grain size distribution)	Not available
119	WB	Streams/Rivers	Current velocity	Not available
120	WB	Streams/Rivers	Riparian vegetation	Not available
121	WB	Streams/Rivers	Streams wetted perimeter	Not available
122	WB	Terrestrial	Snow cover	Possibly available
123	WB	Terrestrial	Snow density	Not available
124	WB	Streams/Rivers/Lakes	Water and nitrate stable isotopes (18O, 2H, 15NO3)	Not available
125	MB	Groundwater	Electrical conductivity	Not available
126	MB	Lake	Water transparency	Not available
127	MB	Lake	Vertical profiles of water temperature, pH, EC, turbidity	Not available
128	MB	Lake	Vertical profiles of dissolved oxygen	Not available
129	MB	Lake	In-situ vertical profiles and inflow concentrations of TP, SRP, NO3, DOC, SAC 254	Not available
130	MB	Lake	In-situ vertical profiles and inflow concentrations TOC, POC, TN, NO2, NH4, SRSi, DIC	Not available
131	MB	Streams/Rivers	Turbidity	Not available
132	MB	Streams/Rivers	pH, EC, water temperature	Not available
133	MB	Streams/Rivers	TP, SRP, NO3, DOC, SAC 254	Not available
134	MB	Streams/Rivers	TOC, POC, TDN, NO2, NH4, SRSi, DIC	Not available
135	MB	Streams/Rivers	Cl, SO4, Na, K, Mg, Ca	Not available
136	MB	Atmospheric deposition	Bulk NH4-N, NO3-N, Ntot, P, K deposition in precipitation	Not available
137	MB	Atmospheric deposition	Bulk pH, anion, cation deposition in precipitation	Not available
138	MB	Atmospheric deposition	Bulk NH4-N, NO3-N, Ntot, P, K deposition in canopy throughfall (forests)	Not available
139	MB	Atmospheric deposition	Bulk pH, anion, cation deposition in canopy throughfall (forests)	Not available
140	MB	Atmospheric deposition	Stemflow NH4-N, NO3-N, Ntot, P, K, pH, cation, anion deposition in stemflow (forests)	Not available
141	MB	Atmospheric deposition	Dry deposition of N-components	Not available
142	MB	Biomass	Aboveground litterfall (forests)	Not available
143	MB	Biomass	Belowground biomass	Not available
144	MB	Biomass	Belowground litterfall (fine roots)	Not available
145	MB	Biomass	Leaf C, N, K, P, Ca, Mg, Mn content	Not available
146	MB	Groundwater	Stable Isotopes (18O, 2H)	Not available
147	MB	Groundwater	Greenhouse gases	Not available
148	MB	Groundwater	Multiparameter: pH, O2, turbidity	Not available
149	MB	Groundwater	Nutrient concentration: TP, SRP, TDN, NO3, NO2, NH4, DOC, DIC	Not available
150	MB	Groundwater	Stable Isotopes (15NO3)	Not available

No	Do-main	Compartment Component	Variable	Statistical data availability
151	MB	Groundwater	Major ion concentrations: Cl, SO ₄ , Br, Na, K, Mg, Ca, B	Not available
152	MB	Groundwater	DOM composition	Not available
153	MB	Groundwater	Micropollutants: non-target screening [~1000 substances]	Not available
154	MB	Groundwater	trace element concentration (Ba, Fe, REE)	Not available
155	MB	Groundwater	Radioactive Isotopes (14C, T/3He, T)	Not available
156	MB	Lake	Vertical profiles of major ion concentrations: Cl, SO ₄ , Na, K, Mg, Ca	Not available
157	MB	Net Ecosystem Exchange	CO ₂ flux	Not available
158	MB	Net Ecosystem Exchange	CO ₂ concentration	Not available
159	MB	Net Ecosystem Exchange	CH ₄ flux	Not available
160	MB	Net Ecosystem Exchange	N ₂ O flux	Not available
161	MB	Net Ecosystem Exchange	CH ₄ concentration	Not available
162	MB	Net Ecosystem Exchange	N ₂ O concentration	Not available
163	MB	Net Ecosystem Exchange	CO ₂ flux	Not available
164	MB	Net Ecosystem Exchange	CH ₄ flux	Not available
165	MB	Net Ecosystem Exchange (gas flux chamber)	N ₂ O, NO, NO _x flux	Not available
166	MB	Soil water	pH value	Not available
167	MB	Soil water	Conductivity	Not available
168	MB	Soil water	Percolation	Not available
169	MB	Soil water	NH ₄ -N, NO ₃ -N, DON concentration	Not available
170	MB	Soil water	DOC concentration	Not available
171	MB	Soil water	P concentration	Not available
172	MB	Soil water	Cation concentrations	Not available
173	MB	Soil water	Anion concentrations	Not available
174	MB	Soil water	NH ₄ -N, NO ₃ -N, DON leaching	Not available
175	MB	Soil water	DOC leaching	Not available
176	MB	Streams/Rivers	Organic matter stable isotopes (13C, 15N)	Not available
177	MB	Streams/Rivers	Dissolved oxygen	Not available
178	MB	Streams/Rivers	Transient storage time of stream and hyporheic zone	Not available
179	MB	Streams/Rivers	Micropollutants: non-target screening [~1000 substances]	Not available

Domain abbreviation. AB= Abiotic characteristics; SE=Socio-Ecology; BH= Biotic heterogeneity; EB=Energy budget; WB=Water balance; and MB=Matter budget.

Annex 2: Description of statistical data platforms relevant for eLTER

Content

Introduction to Annex 2	30
Eurostat – Ľuboš Halada	30
LUCAS: Land Use and Coverage Area frame Survey – Hubert Hilbert	34
Joint Research Centre (JRC) – Zuzana Baránková	35
European Environmental Agency – Petra Gašparovičová	38
DG Agriculture – Hubert Hilbert	42
European Soil Data Centre (ESDAC) – Pavol Kenderessy	44
European Forest Information Portal – Lucia Gemmelová	46
European Climate Adaptation Platform - Ľuboš Halada	47
European Territorial Observatory Network (ESPON) - Ľuboš Halada	48
Organisation for Economic Co-operation and Development (OECD) - Ivana Kozelová	48
Food and Agriculture Organization (FAO) – Ľuboš Halada	50
United Nations Statistics Division (UNSD) - Ľuboš Halada	52
References	54

Introduction to Annex 2

This Annex contains descriptions of the main data sources/data providers with EU, Pan-European or global coverage that contain statistical data or databases relevant for eLTER. The aim of the Annex is to provide overview of information available in individual portals. We did not restrict descriptions to themes only relevant to eLTER Standard Observations, rather we tried to provide an overview of the content of individual portals. The additional information could be useful especially for cases when the user needs data that are not covered by datasets described in the data catalogue (Annex 3 of this report).

The EU institutions, especially Eurostat, DG Environment (DG ENV), DG for Agriculture and Rural Development (DG AGRI), and Joint research Centre (JRC) cooperate and share information. Therefore, some data can be found in more than one portal consequently they are mentioned in this Annex in different places.

In the text below we firstly describe nine European portals, then three portals having global dimension: Organisation for Economic Co-operation and Development (OECD), Food and Agriculture Organization (FAO), and United Nations Statistics Division (UNSD).

Eurostat - Ľuboš Halada

EUROSTAT is the statistical authority of the European Union, its mission is to provide high quality statistics for Europe. At Union level, Eurostat ensures the production of European statistics according to established rules and statistical principles. Eurostat publishes a wide range of publications, but most of the information is concentrated in the form of Eurostat databases and electronic publications. Statistics are available free of charge on the Eurostat website. The data constitute many indicators (short-term, thematic and other) on the European Union and the euro area, the Member States and their partners. Web link: <https://ec.europa.eu/eurostat/web/main/home>.



Eurostat data are structured in several ways; the main categories of data include: Themes; EU Policy Indicators and Cross-cutting topics.

Themes

Data are organised into 9 main themes:

- General and regional statistics
- Economy and finance
- Population and social conditions
- Industry, trade and services
- Agriculture, forestry and fisheries
- International trade
- Transport
- Environment and energy
- Science, technology, digital society

Web link: <https://ec.europa.eu/eurostat/web/main/data/database>

Table A2.1: Themes - list of potentially relevant EUROSTAT indicators

Theme	Statistics, indicators
Regional statistics by NUTS classification	Regional agriculture statistics (33*); Regional demographic statistics (54), Regional economic accounts (13), Regional education statistics (22), Regional science and technology statistics (26), Regional health statistics (46), Regional tourism statistics (9), Regional transport statistics (19), Regional labour market statistics (40), Regional labour costs statistics (15), Regional digital economy and society (7), Regional environmental and energy statistics (5), Regional poverty and social exclusion statistics (4), Regional crime statistics (1)
Economy and finance	National accounts (ESA 2010) (128), Government statistics (24), Exchange rates (14), Interest rates (27), Prices (43), Balance of payments - International transactions (7), Balance of payments - International transactions (BPM6) (20)
Population and social conditions	Population and housing censuses (88), Demography, population stock and balance (98), Population projections (13), Migration (101), Health (567), Education and training (538), Labour market (1,113), Living conditions and welfare (443), Income, consumption and wealth - experimental statistics (44), Social protection (23), Youth (72), Culture (50), Sport (35), Crime and criminal justice (23)
Industry, trade and services	Short-term business statistics (58), Structural business statistics (247), Tourism (106), Statistics on the production of manufactured goods (3)
Agriculture	Farm structure (184), Economic accounts for agriculture (14), Agriculture prices and price indices (37); Agricultural production (45), Organic farming (15), Structure of orchards and vineyards (43), Agriculture and environment (15)
Forestry	Timber removals, wood products and trade (11); Economics (9), Employment (3), Forest resources (4), Environmental functions (2)
Fisheries	Catches by fishing area (30); Aquaculture production by species (8); Landings of fishery products (26), Fishing fleet (2)
Transport	Multimodal data (41), Railway transport (153), Road transport (126), Inland waterways transport (34), Oil pipeline transport (7), Maritime transport (135), Air transport (107)
Environment	Emissions of greenhouse gases and air pollutants (8), Material flows and resource productivity (11), Physical energy flow accounts (4), Environmental taxes (2), Environmental protection expenditure (20), Environmental goods and services sector (3), Waste (17), Water (14), Chemicals (1), Biodiversity (3)
Energy	Energy statistics - quantities (91), Energy statistics - prices of natural gas and electricity (18), Energy statistics - market structure indicators - natural gas and electricity (1), Energy statistics - cooling and heating degree days (4)
Science and technology	Research and development (R&D) (34), Community innovation survey (210), High-tech industry and knowledge-intensive services (40), Human Resources in Science & Technology (29), Intellectual property rights (35)
Digital economy and society	ICT usage in households and by individuals (58), ICT usage in enterprises (24), Digital skills (18), ICT sector (12), Digital economy and society - historical data (28)

* Numbers in brackets represent number of indicators in particular group

EU Policy Indicators

The EU Policy Indicators are organised to 7 main groups:

- Macroeconomic imbalance procedure indicators
- Euro indicators / Principal European Economic Indicators (PEEI)
- Europe 2020 indicators
- Circular economy indicators
- Sustainable development indicators
- Employment and social policy indicators
- European pillar of social rights (EPSR)



The sustainable development indicators are organised according individual goals, in the table A2.2 we provide list of indicators for selected goals.

Web link:

https://ec.europa.eu/eurostat/databrowser/explore/all/tb_eu?lang=en&display=list&sort=category

Table A2.2: List of potentially relevant sustainable development Indicators

Goal	Indicators
Goal 2 – Zero hunger	Agricultural factor income per annual work unit (AWU) (source: Eurostat, DG AGRI) [SDG_02_20], Area under organic farming [SDG_02_40], Harmonised risk indicator for pesticides (HRI1), by groups of active substances (source: DG SANTE) [SDG_02_51], Ammonia emissions from agriculture (source: EEA) [SDG_02_60], Nitrate in groundwater (source: EEA), Estimated soil erosion by water - area affected by severe erosion rate (source: JRC) [SDG_15_50], Common bird index by type of species - EU aggregate (source: EBCC) [SDG_15_60]
Goal 6 - Clean water and sanitation	Biochemical oxygen demand in rivers (source: EEA) [SDG_06_30]; Nitrate in groundwater (source: EEA) [SDG_06_40]; Phosphate in rivers (source: EEA) [SDG_06_50]
Goal 13 – Climate action	Greenhouse gas emissions (source: EEA) (sdg_13_10); Mean near-surface temperature deviation (source: EEA) [SDG_13_30], Greenhouse gas emissions intensity of energy consumption (source: EEA and Eurostat) (sdg_13_20), Climate related economic losses by type of event - EU aggregate (source: EEA) (sdg_13_40), Contribution to the international 100bn USD commitment on climate related expending (source: DG CLIMA, EIONET) (sdg_13_50), Primary energy consumption (sdg_07_10), Final energy consumption (sdg_07_11), Share of renewable energy in gross final energy consumption by sector (sdg_07_40); Average CO2 emissions per km from new passenger cars (source: EEA, DG CLIMA) (sdg_12_30); Global mean ocean surface acidity (source: CMEMS) (sdg_14_50)
Goal 15 – Life on land	Share of forest area (sdg_15_10); Surface of terrestrial sites designated under NATURA 2000 (source: DG ENV, EEA) (sdg_15_20); Soil sealing index (source: EEA) (sdg_15_41); Estimated soil erosion by water - area affected by severe erosion rate (source: JRC) (sdg_15_50); Common bird index by type of species - EU aggregate (source: EBCC) (sdg_15_60); Grassland butterfly index - EU aggregate (source: EEA, BCE) (sdg_15_61); Biochemical oxygen demand in rivers (source: EEA) (sdg_06_30); Nitrate in groundwater (source: EEA) (sdg_06_40); Phosphate in rivers (source: EEA) (sdg_06_50); Settlement area per capita (sdg_11_31).

Cross-cutting topics

The data are organised by 8 cross-cutting topics:

- Quality of life
- Migrant integration and children in migration
- Economic globalisation indicators
- Equality (age and gender)
- Quality of employment
- Agri-environmental indicators
- Climate change
- Skills-related statistics

Web links: <https://ec.europa.eu/eurostat/web/agriculture/agri-environmental-indicators>
<https://ec.europa.eu/eurostat/databrowser/explore/all/cc?lang=en&display=list&sort=category>;

Table A2.3: Cross-cutting issues - list of potentially relevant EUROSTAT indicators and their groups

Domain	Statistics, indicators
Quality of life	Material living conditions (12*); Productive or other main activity (30), Health (16), Education (6), Leisure and social interactions (19), Economic security and physical safety (5), Governance and basic rights (5), Natural and living environment (5), Overall experience of life (3)
Agri-environmental indicators	Area under organic farming (sdg_02_40); Sales of fertilisers by type of nutrient (source: Fertilizers Europe) (tai01); Sales of fertilisers by type of nutrient (source: Fertilizers Europe) (tai01), hare of irrigable and irrigated areas in utilised agricultural area (UAA) by NUTS 2 regions (tai03); Final energy consumption by agriculture/forestry per hectare of utilised agricultural area (tai04); Share of main land types in utilised agricultural area (UAA) by NUTS 2 regions (tai05); Share of main livestock types in total livestock units (LSU) by NUTS 2 regions (tai06); Livestock density index (tai09); Gross nutrient balance on agricultural land (t2020_rn310); Ammonia emissions from agriculture (source: EEA) (sdg_02_60); Ammonia emissions from agriculture - % of the total emissions (source: EEA) (tai07); Greenhouse gas emissions from agriculture (tai08)
Climate change	Greenhouse gas emissions (10), Drivers - Energy (16), Transport (9), Industrial processes and product use ((3), Waste (3), Agriculture (8), Land use, land use change and forestry (10), Mitigation (12); Impact and adaptation (16), Climate action initiatives (1)

* Numbers in brackets represent number of indicators in particular group

Eurostat Publications

Eurostat publishes a wide range of publications. They are primarily published in English, but are also available in other languages. All printed publications are available on the EU Bookshop, most of them are free-of-charge. The PDF version can be downloaded for free from the Eurostat website.



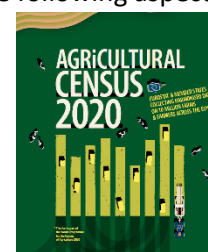
Eurostat's publications programme consists of several collections: Statistical books, Statistics in Focus, Data in focus, Dataset, Manuals and guidelines, Statistical working papers, Statistical reports, Compact guides and catalogues, Digital publications, Leaflets and other brochures, Eurostat News. The database of publications is searchable or could be accessed through 9 main themes specified above.

Web link: <https://ec.europa.eu/eurostat/web/main/publications/all-publications>

Agricultural Census 2020

In 2020-2021, the Agricultural Census will be organised in the EU Member States. In the EU's Agricultural Census 2020 approximately 300 variables will be collected, covering the following aspects on farming:

- General characteristics of the farm and the farmer
- Land
- Livestock
- Labour force
- Animal housing and manure management
- Rural development support measures



Within each of these broad aspects a considerable amount of data will be collected. This survey should bring consistent data across EU that will be relevant for eLTER. Eurostat will begin receiving data on the millions of European farms from each of the Member States in 2021, with the bulk of the data arriving in the first quarter of 2022. Its role is to ensure the quality of the data, to anonymise the individual data; to aggregate data to provide EU totals or averages; to disseminate the data in its

database and analyse the results. More information about the Agricultural Census 2020 can be found at: <https://ec.europa.eu/eurostat/web/agriculture/census-2020>.

Earth Observation for statistics

Eurostat currently explores possibilities for use of earth observation (EO) data for statistics. In 2020 Eurostat issued contract to test different methodologies to produce area statistics for different Copernicus High Resolution Layers and for the changes between different years, using several – biased and “unbiased” - statistical approaches (see EFTAS 2021). Three different types of reference data are used to assess the accuracy of HRL Forest and Imperviousness layers and to demonstrate different methods for area estimation. The results are compared with the LUCAS area estimates and to the biased area estimates derived from the EO.

Similar activities is performing the European Space Agency (ESA). ESA Sen4Stat - Sentinels for Agricultural Statistics aim at development and demonstration of agricultural Earth Observation products and workflows based on the Sentinel missions of the European Union Copernicus program, which support the agricultural statistics. For details see <https://www.esa-sen4stat.org/>.

LUCAS: Land Use and Coverage Area frame Survey – Hubert Hilbert

LUCAS is managed by Eurostat, but because it is based on specific survey and sampling procedures, we decided to describe it separately.

LUCAS introduction

Following a decision of the European Parliament, the European Statistical Office (EUROSTAT) in close cooperation with the Directorate General responsible for Agriculture and the technical support of the JRC, is organising regular, harmonised surveys across all Member States to gather information on land cover and land use. This survey is known as LUCAS (Land Use/Cover Area frame statistical Survey), carried out in-situ; a large number of observations are made and registered throughout the EU in different land use or land cover types are computed on the basis of observations.

Eurostat has carried out this survey every 3 years since 2006 to identify changes in the EU in:

- land use, meaning the socioeconomic use of land - for instance, agriculture, forestry, recreation or residential use.
- land cover - for instance crops, grass, broad-leaved forest, or built-up area.

Since 2012, all 27 EU countries have been covered and over 270,000 points have been analysed on different land cover types (cropland, grassland, forest, built-up areas, transport network, etc.). The latest published LUCAS survey dates from 2018. The survey started in March 2018 and ended in November 2018. The photos were available in June 2019 with other results available in the 1st quarter of 2020. It provided observations at more than 330,000 points surveyed in the EU Member States. By repeating the survey every few years, changes to land use can be identified.

What information is collected?

Three main types of information are obtained from LUCAS surveys:

- Micro-data: land cover, land use and environmental parameters associated with the individual points surveyed.
- Point and landscape photos in the 4 cardinal directions.
- Statistical tables with aggregated results by land cover and land use at geographical level. These estimates are based on weighted point data.

The land cover/use statistics derived from the LUCAS survey are unique as they are fully standardised to use the same definitions and methodology.

In 2009, the European Commission extended the periodic Land Use/Land Cover Area Frame Survey (LUCAS) to sample and analyse the main properties of topsoil in 23 Member States of the European Union (EU). This topsoil survey represents the first attempt to build a consistent spatial database of the soil cover across the EU based on standard sampling and analytical procedures, with the analysis of all soil samples being carried out in a single laboratory. Approximately 20,000 points were selected out of the main LUCAS grid for the collection of soil samples. A standardised sampling procedure was used to collect around 0.5 kg of topsoil (0-20 cm). The samples were dispatched to a central laboratory for physical and chemical analyses. All samples have been analysed for the percentage of coarse fragments, particle size distribution (% clay, silt and sand content), pH (in CaCl₂ and H₂O), organic carbon (g/kg), carbonate content (g/kg), phosphorus content (mg/kg), total nitrogen content (g/kg), extractable potassium content (mg/kg), cation exchange capacity (cmol(+)/kg) and multispectral properties. While the LUCAS approach is designed for monitoring land use/land cover change, potential bias in the sampling design may not necessarily capture all soil characteristics in a country. Finally, a customised application has been developed for web browsers that allow users to view and query the LUCAS dataset in a variety of ways.

In 2018, a new grassland module was piloted within the survey. This pilot aims to collect detailed information on the environmental and ecological quality of the grassland, as well as its type and intensity of use. Between April and July 2018, 3,734 grassland points in 26 countries were surveyed using this standardised methodology. Of these points, 747 underwent an additional quality control to check the accuracy of the survey method. This is the first time a standardised methodology has been used to collect ecological data on grasslands in a coordinated manner over such a wide geographical range in Europe (Sutcliffe et al. 2019).

LUCAS data and other information related to LUCAS can be found in following websites:

Basic information on LUCAS: <https://ec.europa.eu/eurostat/web/lucas/overview>

LUCAS description: <https://esdac.jrc.ec.europa.eu/projects/lucas>

LUCAS data: <https://ec.europa.eu/eurostat/web/lucas/data/database>

Copernicus info about LUCAS: <https://land.copernicus.eu/imagery-in-situ/lucas>

Copernicus - Lucas imagery and reference data: <https://land.copernicus.eu/imagery-in-situ/lucas>

Joint Research Centre (JRC) – Zuzana Baránková

The Joint Research Centre creates and maintains a range of scientific tools and databases that are potentially useful for eLTER. They are organised in following groups:

- JRC Data Catalogue
- Urban Data Platform
- Agri4Cast Resource Portal
- Digital Observatory for Protected Areas
- EU Forest
- European Alien Species Information Network
- European Drought Observatory

JRC Data Catalogue

JRC Data Catalogue offers the possibility to choose datasets individually, or assorted according to science area. Altogether it offers 166 collections, some of the most relevant collections are listed below:

- [Data/Modelling platform of resource economics](#) – is about the research in resource economics and sustainability. Some of the concerned disciplines are Agri-food, bioeconomy, biotechnologies, climate change, food and nutrition security. Datasets consist mainly in estimates, coming from analysis or economic models: In addition, it offers web interactive dashboards for the interpretation and self-analysis of these data.
- [Data for the Energy Union](#) - includes data for the governance of the Energy Union such as indicators for research & investment in low-carbon technologies, data related to renewable energy technologies or other energy technology related datasets.
- [Ispra Atmosphere Biosphere Climate Integrated monitoring Station of the JRC](#) - contain the invalidated, quasi real time data measured at the JRC Ispra Atmosphere Biosphere Climate Integrated monitoring Stations.
- [European Flood Awareness System](#) - provides complementary, flood early warning information to its partners. Real-time forecast information is available to EFAS partners only. Archived EFAS information is publicly available.
- [Global Human Settlement Layer](#) - produces new global spatial information, evidence-based analytics, and knowledge describing the human presence in the planet. ...
- [ENSPRESO - an open data, EU-28 wide, transparent](#) and [coherent database of wind, solar and biomass energy potentials](#) - contains datasets from ENSPRESO, an EU-28 wide, open dataset for energy models on renewable energy potentials, at national (NUTS0) and regional levels (NUTS2) for the 2010-2050 period.
- [Land-Use based Integrated Sustainability Assessment modelling platform](#) - is primarily used for the ex-ante evaluation of EC policies that have a direct or indirect territorial impact. It contains 90 datasets.
- [Digital Observatory For Protected Areas](#) - a set of web services and applications that can be used primarily to assess, monitor, report and possibly forecast the state of and the pressure on protected areas at multiple scales.
- [Citizen Science - Citizens' Data](#) - data sets relating to citizen engagement in scientific research, citizen generated data in the wider sense, and their interplay with policymaking.
- [European Soil Data Centre](#) – described in separate chapter below
- [European Union Crop type Map](#) - EU-28 crop type map based on Copernicus Sentinel data at 10-m resolution.
- [River Flood Hazard Maps at European and Global Scale](#) - datasets depict flood prone areas in Europe and the World for river flood events of different magnitude (from 1-in-10-year to 1-in-500-year). European-scale maps comprise most of the geographical Europe and all the river basins entering the Mediterranean and Black Seas in the Caucasus, Middle East and Northern Africa countries.
- [Global Energy and Climate Outlook](#) - includes energy-economy modelling of climate and energy policies and pathways for transitions to a low-carbon economy. Produces datasets of greenhouse gas emissions, energy and economic activity balances for several scenarios for 36 world regions and the EU.
- [Global Surface Water Explorer](#) - maps the location and temporal distribution of water surfaces at the global scale over the past 32 years and provides statistics on the extent and change of those water surfaces.
- [JRC Forest Research Activities](#) - provides links to finalized research activities on Global and European forests that were carried out within the JRC. It includes 117 datasets and maps.
- [LUCAS - Land Use and Coverage Area frame Survey](#) - described in a separate chapter above.
- [Mapping and Assessment of Ecosystems and their Services](#) - a series of maps of ecosystem services. The data are organised in GIS raster and vector datasets
- [Mobility Research Data](#) - datasets or indicators about global or European mobility at national or regional (NUTS3) level (based on air traffic data or, in the future, Mobile Network Operators derived indicators)
- [National Renewable Energy Action Plans](#) - provides information on the expected development of renewable energy in three main sectors: Electricity, Heating/Cooling and Transport.

- [JRC Publications Repository data](#) - All work programme outputs starting from 2013, approximately 5000 outputs pre year. Metadata of 30.000 JRC publications
- [POTEnCIA scenarios](#) - modelling tool that allows for a robust assessment of the impact of different policy futures on the EU energy system
- [Hazards: floods, drought and water resources](#) - XXI century projections of river-related hazards (floods, droughts, water resources) at European scale.
- [Technical and economic information about renewable energy technologies](#) - datasets about renewable energy technologies such as wind, ocean, geothermal. Information includes technology data (capacities, installations) and market information (supply chain actors, organisations)
- [Water Pressure Indicators](#) - analyses water resources vulnerability and evaluates cost-effective mixes of river basin management measures through hydro-economic modelling. It provides guidance on water reuse in the context of a circular economy.

Web link: <https://data.jrc.ec.europa.eu/>

Urban Data Platform Plus

Urban Data Platform provides access to information on the **status and trends of cities and regions** of the EU. It offers:

- Dashboards - contain collection of official and experimental indicators covering socio-economic and environmental aspects that have an impact on our everyday life.
- Strategies – as policy learning tools to design, implement and monitor strategies for urban and territorial development supported by EU cohesion policy, based on a unique knowledge base covering all Europe
- The localisation of the Sustainable Development Goals (SDGs) that involves the definition, implementation and monitoring of strategies at the local level, which is essential to achieve the 2030 Agenda for Sustainable Development.
- Thematic Analyses - combine data with analytical capabilities. The final aim consists in making sense of geo-spatial statistical information by transforming data mapping into sound multi-dimensional analysis at various territorial levels, from national to regional and urban.
- Tools - offer some tools in analysing data sets based on different formats and allow downloading data.

Web link: <http://urban.jrc.ec.europa.eu>

Agri4Cast Resource Portal

The platform provides access to agro-meteorological data, crop statistics, crop calendar, or crop yield simulation in Europe.

Web link: <https://agri4cast.jrc.ec.europa.eu/DataPortal/Index.aspx?o=d>

Digital Observatory for Protected Areas

The Digital Observatory for Protected Areas (DOPA) is a set of web services and applications that can be used primarily to assess, monitor, report and possibly forecast the state of and the pressure on protected areas at multiple scales. The data, indicators, maps and tools provided by the DOPA are relevant to a number of end-users including policy makers, funding agencies, protected area agencies and managers, researchers and the Convention on Biological Diversity (CBD). Using global reference datasets, the DOPA supports global assessments but also provides a broad range of consistent and comparable indicators at country, ecoregion and protected area level.

Web link: <https://dopa.jrc.ec.europa.eu/en>

EU Forest

The EU-Forest dataset is the result of a joint effort between the JRC and the National Forest Inventories, aiming at producing a harmonised dataset that integrates and extends by almost one order of magnitude the publicly available information on European tree species distribution.

EU-Forest is an extremely valuable resource for several disciplines, including biodiversity conservation, palaeoecology, plant ecology, bioeconomy, and pest management. The EU-Forest dataset includes more than half a million tree occurrences distributed over nearly 250,000 forest plots across 21 European countries. For more detailed information, see chapter *European Forest Information Portal* below.

Web link: https://figshare.com/collections/A_high-resolution_pan-European_tree_occurrence_dataset/3288407

European Alien Species Information Network

The European Alien Species Information Network (EASIN) aims to increase the access to data and information on alien species in Europe. EASIN facilitates the exploration of existing alien species information from distributed resources through a network of interoperable web services, following internationally recognised standards and protocols.

Web link: <http://easin.jrc.ec.europa.eu/>

European Drought Observatory

The available data and tools of the European Drought Observatory (EDO) website includes free data, analysis tools such as one for comparing indicators, and the opportunity to download data for offline analysis.

Web link: <https://edo.jrc.ec.europa.eu/edov2/php/index.php?id=1000>

DataM - Data-Modelling platform of resource economics

DataM is a Commission's platform for management and analysis of data and output from models addressing issues of resource economics and sustainability. It links the process of knowledge production with the need to provide open data access and communicate the results in a user-friendly way through the web.

Besides providing access to raw data, this portal offers dashboards for self-analysis of the results, delivering modern on-line output that complements scientific papers of these fields. Open data and dashboards are integrated in a knowledge-base that includes information on related events, publications, partners, projects, and on modelling tools.

For the European agri-food sector, DataM is the web location for economic studies assessing the impact of key policy changes (e.g., CAP evolution, free trade agreements, etc..) and for key datasets like the EU estimated agricultural balance sheets, the commodity flows of the Medium-term agricultural Outlook, and the EU BioSAMs. DataM is integrated with the JRC data catalogue and links to the Modelling Inventory and Knowledge Management System of the European Commission (MIDAS). Web link: <https://datam.jrc.ec.europa.eu/datam/public/pages/index.xhtml>

European Environmental Agency – Petra Gašparovičová

The European Environment Agency (EEA) is an agency of the European Union, whose task is to provide sound, independent information on the environment. The EEA aims to support sustainable development by helping to achieve significant and measurable improvement in Europe's environment,

through the provision of timely, targeted, relevant and reliable information to policymaking agents and the public.



The information provided by the EEA comes from a wide range of sources. The EEA now has 32 member countries, 6 cooperating



countries and one former member country (United Kingdom). The European environment information and observation network (Eionet) is a partnership network of the EEA and the countries. The EEA is responsible for developing the network and coordinating its activities. To do this, EEA works closely with National Focal Points (NFP) - typically national environment agencies or environment ministries in member countries. They are responsible for coordinating the activities of Eionet at national level. Among other tasks, NFPs develop and maintain the national network of National Reference Centres (NRCs), bringing together experts from national institutions and other bodies involved in environmental information. NFPs should identify national information sources, capture and channel data and information from monitoring and other activities, help the EEA analyse information and assist in communicating EEA information to end-users in member countries. Web link: <https://www.eionet.europa.eu/>

Other important partners and information sources are European and international organisations, such as the Statistical Office (Eurostat) and the Joint Research Centre (JRC) of the European Commission, the Organisation for Economic Co-operation and Development (OECD). The EEA cooperates closely with these organisations in producing information and assessments for its clients and target groups. The EEA also takes part in and acts as the secretariat for the informal network of Environment Protection Agencies in Europe.

EEA Spatial Data Infrastructure

The Spatial data catalogue (SDI) is arranged by 13 topics (Figure A2.1) and 30 INSPIRE themes (Fig A2.2).

Weblinks: [https://sdi.eea.europa.eu/catalogue/srv/eng/catalog.search#/home](https://sdi.eea.europa.eu/catalogue/srv/eng/catalog.search#/home;);
<https://sdi.eea.europa.eu/>;

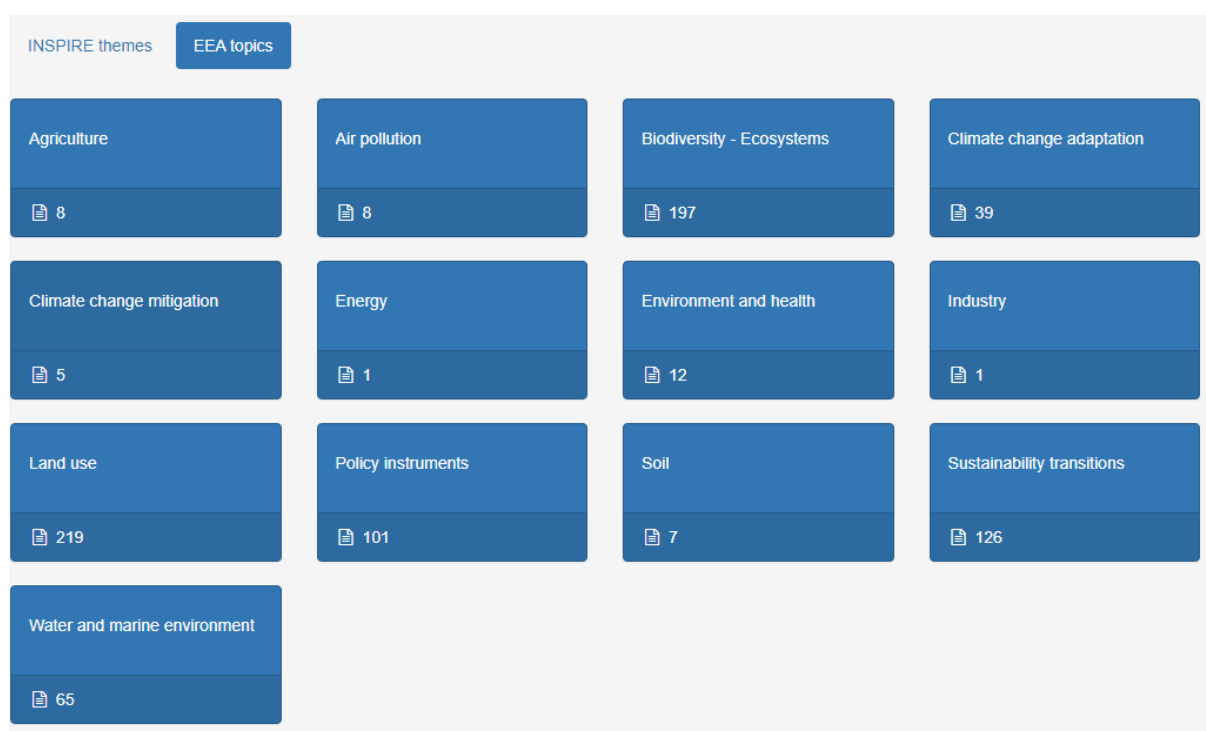


Figure A2.1: The EEA Spatial Infrastructure – topics



Figure 2.2: The EEA Spatial Infrastructure – INSPIRE themes

EEA Data and Maps

EEA Data and Maps provides sound, independent information on the environment. Its data services provides an overview of different datasets, maps, interactive data and maps, indicators, graphs articles, publications, news and videos.

Web link: <https://www.eea.europa.eu/data-and-maps/>

Copernicus Land Monitoring Service

Copernicus is the European programme for monitoring the Earth, in which data is collected by Earth observation satellites and combined with observation data from sensor networks on the earth's surface. Once collected the data is then processed, providing reliable and up-to-date information within six thematic areas. These areas are: land, marine, atmosphere, climate change, emergency management and security. Copernicus Land Monitoring Service (CLMS) provides geographical information on land cover to a broad range of users in the field of environmental terrestrial

applications. This includes land use, land cover characteristics and changes, vegetation state, water cycle and earth surface energy variables. Web link: <https://land.copernicus.eu/>

EEA Indicators

EEA indicators are designed to support all phases of environmental policy making, from designing policy frameworks to setting targets, and from policy monitoring and evaluation to communicating to policy-makers and the public.



Each indicator tells the reader about the trend (or status) of the phenomenon being investigated over a given period of time. It also specifies whether or not associated policy objectives are being met and quantitative targets reached. Where these are not being achieved, it discusses the reasons for this.

Web link: https://www.eea.europa.eu/ims#c0=30&c12-operator=or&b_start=0&c10=CSI

EEA DiscoMap

Discomap is a website for developers and GIS experts to allow re-use of EEA map-services.

The European Environment Agency provides the public with GIS APIs to get a wide range of environmental data for Europe and helps you create your own map-services. As of today EEA covers the thematic areas such as Air, Climate, Water, Biodiversity, Land, Noise, Copernicus and some other. EEA gives anybody the rights to re-link these services



DiscoMap

into their own web-site or portals. EEA content can be integrated in many different ways by developers or by any end-user who might find an interest in combining EEA's information with their own or other public map-services (mashups). All these map-services have metadata and a simple interface allow user to discover content. These map-services are exposed in many other portals such as the INSPIRE portal, ArcGis.com, GEOS and many other. EEA however only maintains its metadata from the services hosted in this infrastructure. Standard WMS provided, possibility to be harvested from any geoportal using standard protocols.

Formats of spatial data given although it is not possible to download these data because the web services, they allow to “view” the data as a kind of image while it is not possible to get the data themselves (as shapefiles or GeoTIFFs, for instance). Web link: <https://discomap.eea.europa.eu/Index/>

WISE – Water Information System for Europe

The Water Information System for Europe (WISE) is a partnership between the European Commission and the European Environment Agency (EEA). WISE was launched in 2007 providing a web-portal entry to water related information ranging from inland waters to marine.



WISE addresses several user groups:

- For users from EU institutions or other environmental national, regional and local administrations WISE provides input to thematic assessments in the context of EU water related policies.
- For water professionals and scientists WISE facilitates access to reference documents and thematic data, which can be downloaded for further analyses.
- For the general public, including private or public entities, WISE illustrates a wide span of water related information through interactive maps, charts and indicators.

Web link: <https://water.europa.eu>

BISE – Biodiversity Information System for Europe



The Biodiversity Information System for Europe (BISE) is a single entry point for data and information on biodiversity in the EU. Bringing together facts and figures on biodiversity and ecosystem services, it links to related policies, environmental data centres, assessments and research findings from various sources. It is being developed to strengthen the knowledge base and support decision-making on biodiversity.

BISE is a collaborative IT tool that builds on existing operating systems at the EU and global levels, based on the European Biodiversity Clearing House Mechanism (EC-CHM) Toolkit.

BISE organises information at the European level under five entry points:

- Policy: policy, legislation and supporting activities related to EU directives, the EU Biodiversity Action Plan (BAP), pan- European and global policies;
- Topics: state of species, habitats, ecosystems, genetic diversity, threats to biodiversity, impacts of biodiversity loss, evaluation of policy responses;
- Data: data sources, statistics and maps related to land, water, soil, air, marine, agriculture, forestry, fisheries, tourism, energy, land use, transport;
- Research: important EU-wide research projects related to biodiversity and ecosystem services, improving the science-policy interface;
- Countries and networks: national biodiversity reporting activities and information sharing by networks across national borders.

Web link: <https://biodiversity.europa.eu/>

DG Agriculture – Hubert Hilbert

Agri-Food Data Portal

The Agri-Food Data Portal contains data on national and European agriculture and Common Agricultural Policy (CAP), provided by the European Commission's agricultural and rural development department. The portal is organised in three areas:

- Agri-Food markets
- Common Agricultural Policy indicators
- Farm Economics.



Agri-food Markets



CAP Indicators



Farm Economics



Geoportals



EU financing



Country factsheets

Agri-Food markets. Market data on national and European agriculture. Information on production and consumption, import, exports, prices, organised by theme while covering all agricultural sectors. The data can be browsed by topic (Prices, Production, Trade and Quotas, Dashboards, School Schemes) or browsed by Market Sector (Beef, Pigeon, Eggs and Poultry, Sheep and Goat Meat, Milk and Dairy Products, Fruit and Vegetables, Cereals, Rice, Oilseeds and Protein crops, Sugar, Olive oil and Table olives, Wine) in format pdf. Every sector consists of the information about prices, production, trade by form of charts and dashboards. Agri-Food markets data:

https://agridata.ec.europa.eu/extensions/DataPortal/agricultural_markets.html

Common Agricultural Policy (CAP) indicators. Indicators for measuring CAP performance. The Common Monitoring and Evaluation Framework (CMEF) for the CAP 2014-2020 identifies a set of performance indicators in four categories: context, output, result, and impact. The indicators are combined with further information (such as on trade and quality schemes) into 13 thematic presentations at EU and Member States level (Financing the CAP, Farming Income Support, Jobs and Growth in Rural Areas, Market Orientation, Adding Value, Productivity, environment and Climate Action, Climate Change and Air Quality, Organic Production, Water Quality and Availability, Soil Quality, Biodiversity, Food and Health Quality Protection).

Context indicators provide information on agricultural and rural statistics as well as general economic and environmental trends.

A. Socio-economic indicators: Population, Age structure, Territory, Population density, Employment rate, Self-employment rate, Unemployment rate, GDP per capita, Poverty rate, Structure of the economy, Structure of the employment, Labour productivity by economic sector.

B. Sectoral indicators (Employment by economic activity, Labour productivity in agriculture, Labour productivity in forestry, Labour productivity in the food industry, Agricultural holdings (farms), Agricultural area, Agricultural area under organic farming, Irrigable land, Livestock units, Farm labour force, Age structure of farm managers, Agricultural training of farm managers, Agricultural factor income, Agricultural entrepreneurial income, Total factor productivity in agriculture, Gross fixed capital formation in agriculture, Forest and other wooded land (FOWL), Tourism infrastructure.

C. Environmental indicators: Land cover, Areas facing natural and other specific constraints (ANCs), Farming intensity, Natura 2000 areas, Farmland birds index (FBI), Conservation status of agricultural habitats (grassland), HNV (high nature value) farming, Protected forest, Water abstraction in agriculture /WEI+, Water quality (*), Soil organic matter in arable land, Soil erosion by water, Production of renewable energy from agriculture and forestry, Energy use in agriculture, forestry and food industry, Emissions from agriculture / GHG per LSU, Sales/Use of antimicrobials in food producing animals, Risk, use and impacts of pesticides. Some of this information drills down to regional level (NUTS 2-3).

Web link: https://agridata.ec.europa.eu/extensions/DataPortal/cmef_indicators.html

Farm Economics. Economic reports on EU farming, based on sample data from the Farm Accountancy Data Network (FADN).

- Economic analysis - Farms' economic performance at member states, farming types and economic size level. (Member States, Crop farm types, Livestock farm types)
- FADN database - In the database the standard results are available, a set of statistics that are periodically produced and published by the Commission. They describe in considerable detail the economic situation of farmers by different groups throughout the European Union. (FADN data from 2004 onwards, FADN data from 1989 to 2009).
- Agriculture sectors results - Economic overview of EU specialized farms providing trends on structural information, revenues and costs, gross and net margin, income and opportunity costs (Milk specialised farm).

Web link: <https://agridata.ec.europa.eu/extensions/FarmEconomyFocus/FarmEconomyFocus.html>

Geoportals. A discovery hub providing access to the Member States' geoportals that publish spatial data collected in the context of Integrated administration and control system (IACS).

Web link: <https://agridata.ec.europa.eu/extensions/iacs/iacs.html>

Performance of agricultural policy

Information on country level is presented here, namely:

- EU country factsheets: presentation of the main economic and agricultural data for each EU country
- Rural development factsheets: an overview of rural development programmes per country for period 2014-2020.
- CAP specific objectives by country: country factsheets for the 9 specific objectives of the common agricultural policy.

Web link: https://ec.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/performance-agricultural-policy_en

European Soil Data Centre (ESDAC) – Pavol Kenderessy

The main objective of the data centre is to support policies and data requirements at DG ENV. The European Soil Data Centre (ESDAC) is the thematic centre for soil related data and information at pan European scale. The ESDAC acts as the primary data contact point for DG ENV in order to fulfil DG ENV's soil information needs. Specifically, ESDAC should provide DG ENV with quality-assured scientific and technical support on issues related to the proposed Soil Framework Directive, such as the development of guidelines on the identification of risk areas related to the major soil threats, and guidelines on data and metadata quality, utilization of historical data, methods, access and data-exchange formats related to the implementation of the Directive. The main objective is to ensure that soil data are collected, quality-checked and organized in an efficient way and that all data are accessible to various third parties.

The ESDAC is populated with data coming from a significant number of data providers:

- **In-house JRC projects:** Data which are already available at JRC, originating from in-house research or from collaboration with networks of soil experts.
- **Soil sampling activities:** Soil data that are generated within other Commission services in various soil sampling campaigns
- **Network of Soil Data Centres:** National soil survey and/or research organizations feed the ESDAC with national data to allow the development of pan-European products.
- **Collaborative research projects:** Results that stem from collaboration between JRC and important relevant organizations such as EuroGeoSurveys, ISRIC–World-Soil-Information and the Food and Agriculture Organization of the United Nations (FAO).
- **Other services:** Data originating from networks such as European Environment Information and Observation Network (EIONET).
- **New data coming from Member States:** In the context of a proposed Soil Framework Directive
- **European Commission:** Data and information that result from soil related projects at EU-level

Datasets are organized in some broad categories:

European Soil Database

Soil Functions Data

Soil Threats Data

Soil Point Data

Soil Projects Data

European Soil Database (ESDB), datasets that have been derived with the help of the ESDB and general European datasets that contain soil properties. The European Soil Database (ESDB) is an important source of data from many other data and services. For instance, the “European Soil Database v2 Raster Library” contains raster (grid) data files with cell sizes of both 1km x 1km and 10km x 10km for a large

number of soil related parameters. The 10km x 10km rasters are in the public domain access and allow expert users to use the data for instance to run soil, water and air related models. The 1km x 1km rasters are available after a prior registration. The grids fit with ideas from INSPIRE to develop “nested” systems for reporting and updating European (soil) data at different scales, according to a hierarchy of grids with a common point of origin and standardized location and size of grid cells.

Web link: <https://esdac.jrc.ec.europa.eu/resource-type/european-soil-database-soil-properties>

Soil Functions Data - data related to a number of soil functions:

- Soil Biomass Productivity maps of grasslands and pasture, of croplands and of forest areas in the European Union (EU27)
- Maps of the Storing and Filtering Capacity of Soils in Europe
- European map of soil suitability to provide a platform for most human activities (EU28)
- Maps indicating the availability of Raw Material from soils in the European Union
- Soil Organic Carbon - Saturation Capacity in Europe
- Maps of preservation capacity of cultural artefacts and buried materials in soils in the EU
- Global Soil Biodiversity Atlas Maps (map showing a simple index describing the potential level of diversity living in soils on our planet)
- Maps of indicators of soil hydraulic properties for Europe (Water storing capacity of soils in Europe)
- Soil GHG fluxes using LUCAS soil-DayCent (CO₂ and N₂O direct soil fluxes in the LUCAS arable points across the EU)

Web link: <https://esdac.jrc.ec.europa.eu/resource-type/soil-functions-data>

Soil Threats Data – in this category are presented datasets related to soil threats as they have been identified by the European Soil Thematic Strategy. Detailed information about the Soil Threats can be found in the relevant theme section of the portal. For some soil threats such as soil erosion, organic carbon decline, compaction, salinisation, soil biodiversity decline, land take and food security, landslides and heavy metals, datasets are readily available for downloading.

Web link: <https://esdac.jrc.ec.europa.eu/resource-type/soil-threats-data>

Soil Point Data. LUCAS topsoil data consisting of approximately 20,000 points (distributed in 25 countries) selected out of the main LUCAS grid for the collection of soil samples. All samples have been analysed for the percentage of coarse fragments, particle size distribution (% clay, silt and sand content), pH (in CaCl₂ and H₂O), organic carbon (g/kg), carbonate content (g/kg), phosphorous content (mg/kg), total nitrogen content (g/kg), extractable potassium content (mg/kg) , cation exchange capacity (cmol(+)/kg) and multispectral properties.

SPADE database represents profile data incorporated into the Soil Database in order to extend the SGDBE data with quantitative data (since original SGDBE attribute values are qualitative and taken from a discrete set of predefined values). Such quantitative data should allow better modelling. Two types of profile data are provided: estimated profiles and measured profiles. **SPADE-2** was developed to provide sufficient soil property data supporting higher tier modelling of pesticide fate at the European level. The last version **SPADE/M** database consist of 560 measured profiles provided by SPADE-1 in the form of separate spreadsheets, which have been assembled in a structured Microsoft Access Database (.mdb format). The updated version of SPADE/M is called SPADE/M v2 and incorporates a number of significant changes.

Web link: <https://esdac.jrc.ec.europa.eu/resource-type/soil-point-data>

Soil Projects Data – this section includes links to data that find its origin in some of the many soil related projects at JRC. Many of the cited projects did not allow data publication as a consequence of copyright issues. Web link: <https://esdac.jrc.ec.europa.eu/resource-type/soil-projects-data>

The ESDAC user interface consists of three main elements: a catalogue of available resources, a map viewer and the European Soil Portal:

- **The catalogue of soil resources** is a light-weight metadata system that describes and points to various soil resource types: datasets, services/applications, documents, events, projects and external links.
- **The ESDAC Map Viewer** allows the user to navigate key soil data for Europe. It provides access to the attributes of the European Soil Database and some additional data related to main soil threats as identified in the Soil Thematic Strategy.
- **The European Soil Portal** (<http://eusoils.jrc.ec.europa.eu>) is considered as the virtual place where all ESDAC resources are located. The current data and information service makes available four types of products: data, documents, data-based applications and scanned maps.

Web links: <https://esdac.jrc.ec.europa.eu/>

European Forest Information Portal – Lucia Gemmelová

The European Forest Institute (EFI) is running a number of online databases with data and information on different aspects of European forests, forestry and forest research. Databases may originate from projects or EFI's core activities. They represent in many cases data which are frequently used to perform EFI's research tasks. Reference to the original sources of the data are given. These databases can be accessed free of charge by anyone after completion of a simple registration process. Following databases are accessible:



EFISCEN Database - The European Forest Information Scenario Database, EFISCEN, is a forest inventory database of European countries, based on input from national inventory experts. The database is used in particular by the EFISCEN forest scenario model.

Data from 32 European countries are available, but not all EU countries are represented. For some countries data for regions are available, for others, only country-level data are at disposal. Besides countries, it is possible to apply the following filters: Regions, Owners, Sites and Species.

LTFRA Database - Long Term Forest Resources Assessment Database. LTFRA is an interactive searchable database on forest resources in the UNECE region. The database includes data from forest resources assessments implemented by the FAO and UN-ECE/FAO. It is possible to select data from European, but also global inventories of forest resources starting in 1948.

FPTF database - Forest Products Trade Flow Database. FPTF uses trade data from the United Nations United Nations Commodity Trade Statistics database. These data then are processed in order to obtain precise estimates of the trade flows and stored in the FPTF Database. For querying the database, several entries are needed, such as message type, HS code, start and end year of the trade. The store can be searched via Trade report, Query with visualization and Multiple products query. In Query search, the entries are enriched with Reporters and Partners, where individual countries or even groups of countries can be selected.

DFDE - Database on Forest Disturbances in Europe. DFDE allows searching historic information about disturbances in the forests of Europe. The database offers information on abiotic, biotic or complex disturbances. Historical data are available for some countries (oldest from 1449), but most countries started recording data much later. Only one country can be selected in the database at a time.

EFIMED Database – Database on Mediterranean forests. The EFIMED database released in 2008 is built on the project outcomes and allows searching data on the state of the Mediterranean forests, the quantity and value of wood and non-wood forest goods and services. The inventory compiled

data on direct and indirect use values as well as different non-use values, for 18 countries in the Mediterranean basin. The outputs from the database are for different countries in a different year.

Forest Biodiversity in Europe database. It is a searchable database allowing to select data from international and national programs, projects or websites that relate to forest biodiversity. The selection can be based on keywords; it is possible to select the country in which the project is implemented. The data from the database can also be changed or supplemented with new programs, projects and websites.

Besides databases, the EFI is providing also map services:

Forest Map of Europe shows the proportion of total forest cover as well as coniferous and broadleaved forest cover from total land area at a resolution of 1 km x 1 km. High resolution images and GIS files of the forest maps can be downloaded.

Tree species maps for European forests. This is a set of 1x1 km tree species maps showing the distribution of 20 tree species over Europe.

Wood production maps for European forests show the volume of wood production in European forests for the years 2000-2010 at a resolution of 1 km x 1 km.

Web links: <https://www.efi.int/knowledge/databases>; <https://www.efi.int/knowledge/maps>; <http://forestportal.efi.int/>;

European Climate Adaptation Platform - Ľuboš Halada

The European Climate Adaptation Platform Climate-ADAPT is a partnership between the European Commission and the European Environment Agency (EEA). Climate-ADAPT is maintained by the EEA with the support of the European Topic Centre on Climate Change Impacts, Vulnerability and Adaptation (ETC/CCA).



Climate-ADAPT aims to support Europe in adapting to climate change helping users to access and share data and information on:

- Expected climate change in Europe
- Current and future vulnerability of regions and sectors
- EU, national and transnational adaptation strategies and actions
- Adaptation case studies and potential adaptation options
- Tools that support adaptation planning



Climate-ADAPT organizes information under the following main entry points:

- EU Policy: EU Adaptation Policy, Adaptation in EU Policy Sectors (Agriculture, Biodiversity, Coastal areas, Forestry, Water management, Marine and fisheries, Ecosystem-based Approaches, Disaster Risk Reduction, Buildings, Energy, Transport, Health, Urban), EU Regional Policy
- Countries, Transnational regions, Cities
- Knowledge: Topics, Data and indicators, Research projects, Tools, Practice
- Networks

The platform includes a database that contains quality-checked information that can be easily searched. It provides information and data on 62 indicators that are not further structured. Besides indicators, it is possible to search for adaptation options (59 sources), case studies (107), guidance (163), information portals (191), organisations (122), publications and reports (981), research and knowledge projects (694), tools (90), and videos (21).

Web link: <https://climate-adapt.eea.europa.eu/>

European Territorial Observatory Network (ESPON) - Ľuboš Halada

The ESPON 2020 Programme aims at promoting and fostering a European territorial dimension in development and cooperation by providing evidence, knowledge transfer and policy learning to public authorities and other policy actors at all levels.

The ESPON Database Portal supplies different users (researchers, policy makers and stakeholders at regional and local level) with data, indicators and tools that can be used for European territorial development and cohesion policy formulation, application and monitoring at different geographical levels. The ESPON Database Portal gathers, manages and disseminates international statistical (as well as geospatial) data originating from ESPON projects as well as other regional databases such as Eurostat, in order to make them available in a user- and machine-friendly manner, ready for direct use in analyses and policy work for the ESPON community and outside.

The ESPON Database provides access to data at regional, local, urban, neighbourhood (candidate countries), world, grid levels as well as historical data. The user can search for the data using keywords, theme, project, spatial extent or type and download a single dataset or the complete project archive.

The data included in the ESPON Database is mainly coming from European institutions such as EUROSTAT and EEA, and from all ESPON projects. The data and indicators cover the entire European Union plus the UK, Switzerland, Norway, Iceland, Liechtenstein (ESPON space). The the ESPON Database Portal provides access to 359 single indicators and 53 multi indicators (comprising 554 individual classes) arranged in 12 Themes:

- | | |
|----------------------------|----------------------------------|
| - Agriculture & fisheries | - Information Society |
| - Economy, finance & trade | - Labour Market |
| - Education | - Population & Living Conditions |
| - Environment & Energy | - Science & Technology |
| - Governance | - Territorial Structure |
| - Health & Safety | - Transport & Accessibility |



The indicators are especially from three themes: Environment and Energy; Population and living conditions, and Economy, finance and trade.

Web links: <https://www.espon.eu/> <https://apps.espon.eu/>

Organisation for Economic Co-operation and Development (OECD) - Ivana Kozelová

The Organisation for Economic Co-operation and Development (OECD) is an international organisation that works on establishing evidence-

based international standards and finding solutions to a range of social, economic and environmental challenges. Currently there are 37 member countries, including most of the world's highly developed countries. Member countries discuss and develop economic and social policy. The stated goal of OECD is to shape policies that foster prosperity, equality, opportunity and well-being for all.

The OECD publishes economic reports, statistical databases, analyses, and forecasts on the outlook for economic growth worldwide. Reports are variously global, regional, or national in orientation. The group analyzes and reports on the impact of social policy issues and makes policy recommendations designed to foster growth with sensitivity to environmental issues. The organization also seeks to eliminate bribery and other financial crime worldwide.

OECD.Stat includes data and metadata for OECD countries and selected non-member economies. It provides statistical data in separated datasets arranged by themes:

- General statistics
- Agriculture and fisheries
- Economy
- Education
- Employment
- Energy
- Environment
- Finance
- Health
- Industry and entrepreneurship
- Innovation
- Insurance and pensions
- International migration
- Internet economy
- Investment
- OECD Stat data warehouse
- Regional, rural and urban development
- Science and technology
- Social and welfare issues
- Tax
- Trade
- Transport

Table A2.4: Cross-cutting issues - list of potentially relevant EUROSTAT indicators and their groups

Themes	Statistics, indicators
Agriculture and Fisheries	Agricultural Outlook (18*); Agricultural Policy Indicators (81); Environmental Indicators for Agriculture (17); Fisheries and Aquaculture (16)
Demography and Population	Migration Statistics (11); Population Statistics (5); Africapolis (2)
Education and Training	Education at a Glance (200); Teaching and Learning International Survey – TALIS (21); Measuring Innovation in Education (6)
Environment	Air and Climate (6); Water (6); Waste (3); Environmental risks and health (3); Material Resources (1); Forest (1); Land Resources (24); Biodiversity (5); Mineral and Energy Resource Accounts (1); Innovation in environment-related technologies (5); Environmentally Adjusted Multifactor Productivity (1); Environmental Expenditures and Revenues (2); Environmental policy (56); Agri-Environmental indicators: Nutrients (3); Agri-Environmental other indicators (11); Green Growth (7); Sustainable Ocean Economy (2); Policy Indicators on Trade and Environment (9)
Health	Covid-19 health Indicators (3); Health expenditure and financing (9); Health Status (16); Non-Medical Determinants of Health (6); Health Care Resources (17); Health Workforce Migration (7); Health Care Utilisation (10); Health Care Quality Indicators (8); Pharmaceutical Market (4); Long-Term Care Resources and Utilisation (6); Social Protection (4); Demographic References (4); Economic References (3)
Industry and Services	Enterprise Statistics (69); Industry and Service Statistics – MEI (5); Structural Analysis – STAN- Databases (49); Services Trade Restrictions (6); Steel (1); Tourism (7)
National Accounts	Annual National Accounts (58); Quarterly National Accounts (39); Financial Accounts (10); Annual National Accounts, Archive before 2019 benchmark revision (24); Annual National Accounts, SNA93 (18); National Accounts at a Glance (62); Quarterly Public Sector Debt (2); Quarterly Sector Accounts – Financial and non-financial (16); Institutional Investors Statistics (7); Households' financial and non-financial assets and liabilities (2); Financial Dashboard (3); Household Dashboard (2)
Regions and Cities	Regional Statistics (65); Regional Well-Being (2); Subnational government structure and finance (10); Metropolitan areas (9)
Social Protection and Well-being	How's Life – Well-being (6); Social Protection (91); Income distribution and poverty (6); Wealth distribution (2); Benefits, Taxes and Wages (12); Better Life Index (1); Gender (38); Time Use (2); Family (9); Child Well-being (6); Social Protection and Well-being Archives (6)
Transport	Transport Infrastructure (4); Transport Measurement (6); Economic and Social (3); Transport Safety (3); Data from ITF/Eurostat/UNECE questionnaire (21); Performance Indicators (7); Short-term Indicators (4); IRTAD database (1); Transport Outlook (12); India Mobility Model (11); Urban access framework (4)

* Numbers in brackets represent number of indicators in particular group

OECD iLibrary allows searching and extracting data from across datasets, and search data according to indicators. It provides also list of Statistical Series - annual publications covering various themes.

Web link: <https://stats.oecd.org/>

Food and Agriculture Organization (FAO) – Ľuboš Halada

The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger. With over 194 member states, FAO works in over 130 countries worldwide. Statistics is a core function of FAO and represents a highly visible area of the Organization's work. FAO is responsible for the worldwide collection, validation and dissemination of data and information related to food and agriculture. As such, FAO collects relevant national statistical information on a regular basis. The FAO statistical system plays an essential role in the fields of agriculture and food, and in supporting FAO Members to eradicate hunger and promote the sustainable use of natural resources by making informed decisions through access to high quality data.



The data are available through FAO Data centers: FAOSTAT, SDG Indicators, Agricultural Market Information System (AMIS) and Food and Agriculture Microdata Catalogue (FAM).






FAOSTAT provides free access to food and agriculture statistics (including crop, livestock, and forestry sub-sectors) for over 245 countries and territories and covers all FAO regional groupings from 1961 to the most recent year available. FAOSTAT data are arranged in following domains:



- Production
- Food Security and Nutrition
- Food Balances
- Trade
- Prices
- Land, Inputs and Sustainability
- Population and Employment
- Investment
- Macro-Economic Indicators
- Climate Change
- Forestry

Indicators for selected domains are listed in Table A2.4.

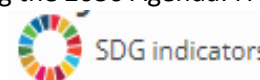
Web link: <https://www.fao.org/faostat/en/#data>

Table A2.4: List of FAO indicators relevant for eLTER

Domain	Indicators and groups of indicators
 Production	Crops and livestock products; Production Indices; Value of Agricultural Production
 Land, Inputs and Sustainability	Land: Land Use, Land Cover. Inputs: Fertilizers by Nutrient, Fertilizers by Product, Livestock Manure, Pesticides Use, Pesticides Trade. Sustainability Indicators: Fertilizers indicators, Pesticides indicators, Land use indicators; Soil nutrient budget; Livestock Patterns
 Population and Employment	Annual population Revision; Employment Indicators

Domain	Indicators and groups of indicators
 Climate Change	Emissions: Emissions Totals; Emissions shares; Emissions intensities. Farm-gate: Crop Residues; Rice Cultivation; Burning - Crop Residues; Enteric Fermentation; Manure applied to Soils; Manure left on Pasture; Manure Management; Synthetic Fertilizers. Land Use and Land Use Change: Drained organic soils; Forests; Fires; Pre- and post- production: Energy Use; Transport; Waste Disposal. Climate Indicators: Temperature change.
 Forestry	Forestry Production and Trade; Forestry Trade Flows

SDG Indicators. FAO is the custodian UN agency for 21 SDG indicators and is a contributing agency for a further 5. In this capacity, FAO is supporting countries' efforts in monitoring the 2030 Agenda. FAO's Statistical Capacity Assessment survey for SDG Indicators provides insights about member countries' national statistical systems in regard to their capacity to monitor and report the 21 SDG indicators under FAO custodianship. Details on the assessment conducted by FAO in 2018/19 and the resulting country profiles can be found here.



Web link: <https://www.fao.org/sustainable-development-goals/indicators/en/>

Table A2.5: List of sustainable development indicators under FAO custodianship and contribution

Goal	Indicators
1 – No poverty	Contributing: 1.4.2 Secure tenure rights to land, 1.5.2 Disaster economic loss
2 – Zero hunger	Custodian: 2.1.1 Hunger; 2.1.2 Severity of food insecurity; 2.3.1 Productivity of small-scale food producers; 2.3.2 Income of small-scale food producer; 2.4.1 Agricultural sustainability; 2.5.1.a Conservation of plant genetic resources for food and agriculture; 2.5.1.b Conservation of animal genetic resources for food and agriculture; 2.5.2 Risk status of livestock breeds; 2.a.1 Public Investment in agriculture; 2.c.1 Food price volatility
5 – Gender equality	Custodian: 5.a.1 Women's ownership of agricultural land; 5.a.2 Women's equal rights to land ownership
6 - Clean water and sanitation	Custodian: 6.4.1 Water use efficiency; 6.4.2 Water stress
12 – Responsible consumption and production	Custodian: 12.3.1 Global food losses
14 – Life below water	Custodian: 14.4.1 Fish stocks sustainability; 14.6.1 Illegal, unreported unregulated fishing; 14.7.1 Value added of sustainable fisheries; 14.b.1 Access rights for small-scale fisheries. Contributing: 14.c.1 Frameworks for conservation and sustainable use of oceans' resources
15 – Life on land	Custodian: 15.1.1 Forest area; 15.2.1 Sustainable forest management; 15.4.2 Mountain Green Cover. Contributing: 15.3.1 Land degradation, 15.6.1 Frameworks for fair and equitable sharing of genetic resources' benefits

Agricultural Market Information System (AMIS). The Agricultural Market Information System (AMIS) is an inter-agency platform to enhance food market transparency and policy response for food security. It was launched in 2011 by the G20 Ministers of Agriculture following the global food price hikes in 2007/08 and 2010. Bringing together the principal trading countries of agricultural commodities, AMIS assesses global food supplies (focusing on wheat, maize, rice and soybeans) and provides a platform to coordinate policy action in times of market uncertainty. AMIS is composed of G20 members plus Spain and seven additional major exporting and importing countries of agricultural commodities. Together, AMIS participants represent a large share of global production, consumption and trade volumes of the targeted crops. AMIS contains summary information for European Union, individual Member States are not distinguished.

Web link: <http://www.amis-outlook.org/>

Food and Agriculture Microdata Catalogue (FAM). The Food and Agriculture Microdata Catalogue provides an inventory of datasets collected through farm and household surveys which contain information related to agriculture, food security, and nutrition. The FAM catalogue is populated by datasets which are collected directly by FAO and datasets whose collection are supported in some way by FAO. The aim is to be a one-stop-shop containing metadata on all agricultural censuses and surveys which are publically available as well as provide direct access and/or links to the microdata. Microdata contain information on individuals, households, business, geographic areas, etc. and are rich input into policy analysis, research, and highly disaggregated (e.g. by gender, migration status, indigenous, age group, etc.) statistics. FAM provides mostly data for individual countries. FAM has five featured collections:

- *Agricultural Census Metadata*: collection of metadata on the Agricultural Census activities in different countries, with no microdata access.
- *Agricultural Surveys and Censuses*: studies which collect data on crops, livestock, forestry, or fisheries.
- *Food security*: studies which contain modules aimed at measuring food security.
- *Forest Inventory Data*: microdata, metadata, and related information on forest inventories across different countries
- *Nutrition*: studies which collect data on individual food consumption.

Web link: <https://www.fao.org/food-agriculture-microdata/en/>

United Nations Statistics Division (UNSD) - Ľuboš Halada

The United Nations Statistics Division is committed to the advancement of the global statistical system. It compiles and disseminates global statistical information, develops



standards and norms for statistical activities, and supports countries' efforts to strengthen their national statistical systems. UNSD provides a global centre for data on international trade, national accounts, energy, industry, environment and demographic and social statistics gathered from national and international sources. Facilitates the follow-up and review process of the 2030 Agenda for Sustainable Development, acting as Secretariat of the Inter-agency and Expert Group on SDG indicators and maintaining the global SDG indicators database.

UNSD provides multiple data solutions, ranging from databases, dissemination services, and tools for Data Science and Big Data integration. Some of these include: a global database on international trade statistics and a new project on trade data tools for countries, data science methods on the UN Global Platform, the UN Global Platform Network on Big Data, cloud-based dissemination services built for data sharing, dissemination and data visualization purposes, as well as the Global Group Register for large multi-national enterprises. Web links: <https://unstats.un.org/home/>; <http://data.un.org/Explorer.aspx>

The main portals of the United Nations Statistics Division data are UNdata, SDG Indicators Database, UN Comtrade Database, and Monthly Bulletin of Statistics Online.

UNdata is a web-based data service for the global user community. It brings international statistical databases within easy reach of users through a single-entry point. Users can search and download a variety of statistical resources compiled by the United Nations (UN) statistical system and other international agencies. The numerous databases or tables collectively known as "datamarts" contain over 60 million data points and cover a wide range of statistical themes including agriculture, crime, communication, development assistance, education, energy, environment, finance, gender, health, labour market, manufacturing, national accounts, population and migration, science and technology,

tourism, transport and trade. The UNdata provides through “datamarts” access to 32 different databases (Figure A2.3), to most relevant ones for eLTER belong:

- Demographic Statistics Database
- Environment Statistics Database
- Greenhouse Gas Inventory Data
- National Accounts Estimates of Main Aggregates
- National Accounts Official Country Data
- UIS Data Centre
- World Development Indicators
- World Health Organisation Data
- World Meteorological Organization Standard Normals
- World Population Prospects: 2019 Revision
- World Tourism Data



+ Commodity Trade Statistics Database	United Nations Statistics Division (UNSD)	i
+ Demographic Statistics Database	United Nations Statistics Division (UNSD)	i
+ Energy Statistics Database	United Nations Statistics Division (UNSD)	i
+ Environment Statistics Database	United Nations Statistics Division (UNSD)	i
+ FAOSTAT	Food and Agriculture Organization (FAO)	i
+ Gender Info	United Nations Statistics Division (UNSD)	i
+ Greenhouse Gas Inventory Data	United Nations Framework Convention on Climate Change (UNFCCC)	i
+ Homicide Statistics	United Nations Office on Drugs and Crime (UNODC)	i
+ Human Development Indices: A statistical update 2019	United Nations Development Programme (UNDP)	i
+ Indicators on Women and Men	United Nations Statistics Division (UNSD)	i
+ INDSTAT	United Nations Industrial Development Organization (UNIDO)	i
+ Industrial Commodity Statistics Database	United Nations Statistics Division (UNSD)	i
+ International Financial Statistics	International Monetary Fund (IMF)	i
+ Key Indicators of the Labour Market, 7th Edition	International Labour Organization (ILO)	i
+ LABORSTA	International Labour Organization (ILO)	i
+ National Accounts Estimates of Main Aggregates	United Nations Statistics Division (UNSD)	i
+ National Accounts Official Country Data	United Nations Statistics Division (UNSD)	i
+ OECD Data	Organisation for Economic Co-operation and Development (OECD)	i
+ The State of the World's Children	United Nations Children's Fund (UNICEF)	i
+ UIS Data Centre	UNESCO Institute for Statistics (UNESCO UIS)	i < >
+ UNAIDS Data	Joint United Nations Programme on HIV/AIDS (UNAIDS)	i
+ UNHCR Statistical Database	United Nations High Commissioner for Refugees (UNHCR)	i
+ WHO Data	World Health Organization (WHO)	i
+ World Contraceptive Use	United Nations Population Division (UNPD)	i
+ World Development Indicators	The World Bank (WB)	i
+ World Fertility Data	United Nations Population Division (UNPD)	i
+ World Marriage Data	United Nations Population Division (UNPD)	i
+ World Meteorological Organization Standard Normals	World Meteorological Organization (WMO)	i
+ World Population Prospects: The 2019 Revision	United Nations Population Division (UNPD)	i
+ World Telecommunication/ICT Indicators Database	International Telecommunications Union (ITU)	i
+ World Telecommunication/ICT Indicators Table	International Telecommunications Union (ITU)	i
+ World Tourism Data	World Tourism Organization (UNWTO)	i

Figure A2.3: Databases accessible through UNdata datamarts

SDG Indicators Database. The Global SDG Indicators Database contains the data on the global indicators and includes both country-level data and regional and global aggregates. It includes data for



166 of the 232 indicators and more than 1.2 million data records. The data is compiled through the UN System in preparation for the Secretary General's annual report on "Progress towards the Sustainable Development Goals". An

accompanying metadata repository provides the metadata for the indicators that have internationally established methodology and standards.

Web link: <https://unstats.un.org/sdgs/unsdg>

UN Comtrade Database provides free access to detailed global trade data. UN Comtrade is a repository of official international trade statistics and relevant analytical tables. All data is accessible through API. Web link:

<https://comtrade.un.org/>



Monthly Bulletin of Statistics Online. The Monthly Bulletin of Statistics Online presents current economic and social statistics for more than 200 countries and territories of the world. It contains 55 tables, comprising over 100 indicators, of monthly, quarterly and annual data on a variety of subjects illustrating important economic trends and developments, including population, industrial production indices, price indices, employment and earnings, energy, manufacturing, transport, construction, international merchandise trade, finance and national accounts. For more than 80 years, the Monthly Bulletin of Statistics has been published by the United Nations Statistics Division and previously by the League of Nations.



The statistics appearing in the Bulletin are obtained by the Statistics Division of the United Nations and the international statistical services from official sources in the countries. International sources for the Bulletin include the Food and Agriculture Organization of the United Nations, International Civil Aviation Organization, International Civil Service Commission, International Labour Office and the International Monetary Fund. Web link: <https://unstats.un.org/unsd/mbs/introduction.aspx>.

References

- EFTAS, 2021: Earth Observation for statistics - methodology and training. O-4-STATISTICS. DLV 1.2 Report on process and findings. - EFTAS Fernerkundung Technologietransfer GmbH, Münster, Germany, 155 pp.
- Sutcliffe, L.M.E., Schraml, A., Eiselt, B., Oppermann, R., 2019: The LUCAS Grassland Module Pilot – qualitative monitoring of grassland in Europe. - *Palaeoctic Grasslands* 40: 27-31.

Annex 3: Catalogue of datasets

Content

6	Soil inventory.....	57
8	Soil organic C content (per horizon)	57
9	Soil total N content (per horizon)	58
10	Soil total P content (per horizon)	58
12	Soil pH (in H ₂ O/KCl/CaCl ₂)	59
16	Population current activity status	59
17	Population industry	60
19	Area under tillage	61
20	Land-based income	61
22	Agricultural products.....	62
23	Harvest (cropland, grassland, forest)	69
26	Basic services provision: health & education.....	72
28	Land cover (CORINE)	73
29	Land use change (CORINE)	78
30	Land use (Statistics).....	79
34	NUTS3 and Local Administrative Units (LAU) spatial databases.....	80
35	Per capita income / GDP per capita	81
36	Population age profile	82
37	Population status of employment	84
38	Population education attainment	86
39	Population residential profile/density	88
40	Resource use (biomass, construction, iron/steel, fossil fuels), trade of resources	90
41	Subsidies programs / schemes.....	90
42	Population consumption statistics	91
44	Farm gate economic return	92
45	Livestock (livestock units)	93
46	Irrigation management, timing, intensity	94
47	Fertilizer input (N, P, K fertilisation, liming, pesticides).....	95
50	Wellbeing information of population	97

53	Number of tourists/visitors to protected areas.....	97
54	Population occupation	98
55	Population place of birth.....	99
56	Living conditions in dwellings.....	100
59	Resource use (energy carriers, electricity, biomass, construction, iron/steel, fossil fuels).....	102
60	Mobility information: accessibility indicators, means of transport.....	104
62	Physical infrastructure networks	104
63	Buildings and other structures.....	105
64	Roads, Railways, Settlement areas	105
68	Birds, bats, frogs, some insects (e.g., grasshoppers) using acoustic recording	107
81	Macrophyte community (quantitative)	108
89	Aboveground biomass.....	109
136	Bulk NH ₄ -N, NO ₃ -N, N _{tot} , P, K deposition in precipitation	109
137	Bulk pH, anion, cation deposition in precipitation	110

Note. Information in this catalogue is related to time of its preparation, i.e. 31.1.2022. This is valid especially for the temporal coverage of datasets. Data are continuously updated, thus both temporal coverage and content are gradually changed.

6 Soil inventory

Variable	6 Soil inventory
Sub-variable	
Task 4.5 code	n/a
Dataset name	European Soil Database v2.0 (vector and attribute data)
Description	The database contains a list of Soil Typological Units (STU). Besides the soil names they represent, these units are described by variables (attributes; 73) specifying the nature and properties of the soils: for example the texture, the water regime, the stoniness, etc. The geographical representation was chosen at a scale corresponding to the 1:1,000,000.
Data provider	JRC-ESDAC (European Soil Data Centre)
URL	https://esdac.jrc.ec.europa.eu/content/european-soil-database-v20-vector-and-attribute-data#tabs-0-description=0
API link	
File name original	SGDBE4_0
Unit	
Spatial resolution	1 : 1 000 000
Spatial coverage	
Temporal resolution	2001
Temporal coverage	2001
T4_2 file name	
Export options	<p>The following files are found in the soilDB_shapefiles_and_attributes directory:</p> <ul style="list-style-type: none"> • SGDBE4_0.shp : Defines the geometry of the 1 : 1000 000 dataset • SGDBE4_0.dbf: Attributes directly linked to SGDBE4_0.shp; for each polygon a SMU number and a "dominant STU" number is given • STU_sgdb.dbf: Attribute table which defines for each STU a number of SGDBE attribute values • STU_ptrdb.dbf: Attribute table which defines for each STU a number of PTRDB attribute values • STUorg.dbf: Correspondence table which defines for each SMU a set of STU's which are present for that SMU; for each STU it is indicated how much percent of the total SMU area is taken by the STU • SMU_sgdb.dbf: Attribute table which defines for each SMU a number of SGDBE attribute values; these values are "dominant values" for the attribute for that SMU • SMU_ptrdb.dbf: Attribute table which defines for each SMU a number of PTRDB attribute values; these values are "dominant values" for the attribute for that SMU
Note	Data available upon request

8 Soil organic C content (per horizon)

Variable	8 Soil organic C content (per horizon)
Sub-variable	
Task 4.5 code	n/a
Dataset name	LUCAS Topsoil
Description	Data from the LUCAS campaign soil component containing soil properties data (clay, silt and sand content, coarse fragments, pH (CaCl ₂ and H ₂ O), organic carbon content, CaCO ₃ , nitrogen, phosphorous, potassium, EC (Electrical conductivity) and multispectral reflectance data for 21,859 samples. These primary data are supplemented by reference ancillary data describing a range of environmental conditions for the LUCAS Soil locations
Data provider	JRC-ESDAC (European Soil Data Centre)

URL	https://esdac.jrc.ec.europa.eu/content/lucas2015-topsoil-data
API link	
Dataset name	LUCAS_Topsoil_2015, LUCAS_Topsoil_2009
File name original	
Unit	point data
Spatial resolution	European Union (EU-27) plus UK
Spatial coverage	EU27 + some other European countries
Temporal resolution	2009, 2015
Temporal coverage	2009, 2015
T4_2 file name	
Export options	Study area: European Union (EU-27) plus UK. Format: CSV files; To facilitate use of the data, .XLS and ESRI shapefile formats are also available; Point data: 21,859 data points. 4,246 are at new locations when compared with the 2009/2012 campaign;
Note	Data available upon request

9 Soil total N content (per horizon)

Variable	9 Soil total N content
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Scenar 2030 Dashboards by Model
Description	Data-Modelling platform of resource economics. Interactive infographics and dashboards predict impact of CAP on the agricultural sector of stylised scenarios, reflecting the main drivers of policy debate. Modelled parameter: N-Surplus.
Data provider	JRC
URL	https://datam.jrc.ec.europa.eu/datam/mashup/SCENAR2030_DASHBOARDS/
API link	
File name original	
Unit	Changes in %
Spatial resolution	NUTS 0, NUTS2
Spatial coverage	EU28
Temporal resolution	2016, 2030
Temporal coverage	2016 - 2030
T4_2 file name	n/a
Export options	3 models: CAPRI Model, IFM - CAP Model, MAGNET Model
Note	Dashboards available.

10 Soil total P content (per horizon)

Variable	10 Soil total P content
Sub-variable	
Task 4.5 code	n/a
Dataset name	LUCAS_Topsoil
Description	Data from the LUCAS campaign soil component containing soil properties data (clay, silt and sand content, coarse fragments, pH (CaCl2 and H2O), organic carbon content, CaCO3, nitrogen, phosphorous, potassium, EC (Electrical conductivity) and multispectral reflectance data for 21,859 samples. These primary data are supplemented by reference ancillary data describing a range of environmental conditions for the LUCAS Soil locations
Data provider	JRC-ESDAC (European Soil Data Centre)

URL	https://esdac.jrc.ec.europa.eu/content/lucas2015-topsoil-data
API link	
File name original	
Unit	point data
Spatial resolution	
Spatial coverage	EU27 + UK
Temporal resolution	2009, 2015
Temporal coverage	2009, 2015
T4_2 file name	
Export options	Study area: European Union (EU-27) plus UK. Format: CSV files; To facilitate use of the data, .XLS and ESRI shapefile formats are also available; Point data: 21,859 data points. 4,246 are at new locations when compared with the 2009/2012 campaign;
Note	Data available upon request

12 Soil pH (in H2O/KCl/CaCl2)

Variable	12 Soil pH
Sub-variable	
Task 4.5 code	n/a
Dataset name	LUCAS_Topsoil
Description	Data from the LUCAS campaign soil component containing soil properties data (clay, silt and sand content, coarse fragments, pH (CaCl2 and H2O), organic carbon content, CaCO3, nitrogen, phosphorous, potassium, EC (Electrical conductivity) and multispectral reflectance data for 21,859 samples. These primary data are supplemented by reference ancillary data describing a range of environmental conditions for the LUCAS Soil locations
Data provider	JRC-ESDAC (European Soil Data Centre)
URL	https://esdac.jrc.ec.europa.eu/content/lucas2015-topsoil-data
API link	
File name original	
Unit	point data
Spatial resolution	
Spatial coverage	EU27 + UK
Temporal resolution	2009, 2015
Temporal coverage	2009, 2015
T4_2 file name	
Export options	Study area: European Union (EU-27) plus UK. Format: CSV files; To facilitate use of the data, .XLS and ESRI shapefile formats are also available; Point data: 21,859 data points. 4,246 are at new locations when compared with the 2009/2012 campaign;
Note	Data available upon request

16 Population current activity status

Variable	16 Population current activity status
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Population by current activity status, educational attainment level and NUTS 2 region

Description	The dataset contains data on activity status of population, education level, age class and sex
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/cens_11aed_r2/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	CENS_11AED_R2
Unit	number
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	
Export options	GEO: 488 regions; Activity and employment status – 6 options: Population, Persons in the labour force (former name: active persons), Employed persons, Unemployed persons, Persons outside the labour force (former name: inactive persons), Unknown; Age class – 28 options; Education (ISCED) – 10 classes; Sex: 3 options;
Note	

17 Population industry

Variable	17 Population industry
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Population by current activity status, NACE Rev. 2 activity and NUTS 2 region
Description	The dataset contains data on economic activity (NACE2), activity and employment status, age class, and sex.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/CENS_11AN_R2_custom_1957135/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	CENS_11AN_R2
Unit	Number
Spatial resolution	NUTS2
Spatial coverage	EU28 + some other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	
Export options	GEO: 477 regions; Statistical classification of economic activities in the European Community (NACE Rev. 2) – 13 units: Total - all NACE activities, [A] Agriculture, forestry and fishing, [B-E] Industry (except construction), [F] Construction, [G-I] Wholesale and retail trade, transport, accommodation and food service activities, [J] Information and communication, [K] Financial and insurance activities, [L] Real estate activities, [M_N] Professional, scientific and technical activities; administrative and support service activities, [O-Q] Public administration, defence, education, human health and social work activities, [R-U] Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies, [UNK] Unknown NACE activity, [NAP] Not applicable. Activity and employment status – 6 units; age class – 28 classes; sex – 3 classes.
Note	

19 Area under tillage

Variable	19 Area under tillage
Sub-variable	n/a
Task 4.5 code	1
Dataset name	Land use: number of farms and areas of different crops by agricultural size of farm (UAA) and NUTS 2 regions
Description	The dataset contains data on number of farms and area of different crops (including area of arable land in hectares) for NUTS2 regions and selected years
Data provider	EUROSTAT
URL	https://ec.europa.eu/eurostat/databrowser/product/page/EF_OLUAAREG_custom_928184
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	EF_OLUAAREG__custom_928184
Unit	ha
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	2005, 2007, 2010, 2013
Temporal coverage	2005-2013
T4_2 file name	19_Area under tillage_Eurostat_NUTS2.xlsx
Export options	Eurofarm indicators: 150 options; indicator B_1_HA is for arable land. Agricultural area: 10 options (total and 9 size categories). Geopolitical entity: 313 units (NUTS0-NUTS2). Time: 4 options (2005, 2007, 2010, 2013)
Note	For output so set: Eurofarm indicator B_1_HA (arable land); Agricultural area: Total

20 Land-based income

Variable	20 Land-based income
Sub-variable	20a Agricultural income
Task 4.5 code	2
Dataset name	Economic accounts for agriculture by NUTS 2 regions
Description	The dataset contains data for economic accounts in agriculture for NUTS2 regions - it offers different selection of agricultural indicators as specified below
Data provider	EUROSTAT
URL	https://appsso.eurostat.ec.europa.eu/nui/show.do
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	agr_r_accts
Unit	Mil EUR
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	yearly
Temporal coverage	1973-2019
T4_2 file name	02_Agricultural income_Eurostat_NUTS2.xls
Export options	Agricultural indicators: Production value at basic price; Subsidies on products; Taxes on products; Production value at producer price. Products (list of products - EEA): plant products (37 variables); animal products (12 variables), agricultural outputs (3 variables), other economic variables (39 variables). Unit of measure: Million euro; Million units of national currency
Note	

Variable	20 Land-based income
Sub-variable	
Task 4.5 code	2
Dataset name	Scenar 2030 Dashboards by Model
Description	Data-Modelling platform of resource economics. Interactive infographics and dashboards predict impact of CAP on the agricultural sector of stylised scenarios, reflecting the main drivers of policy debate. Modelled variable: Income.
Data provider	JRC
URL	https://datam.jrc.ec.europa.eu/datam/mashup/SCENAR2030_DASHBOARDS/
API link	
File name original	
Unit	Changes in %
Spatial resolution	NUTS 0, NUTS2
Spatial coverage	EU28
Temporal resolution	2016, 2030
Temporal coverage	2016 - 2030
T4_2 file name	n/a
Export options	3 models: CAPRI Model, IFM - CAP Model, MAGNET Model
Note	Dashboards available.

22 Agricultural products

Here we distinguish plant products (sub-variable 22a) and animal products (22b). In addition, we included to this category also fishery products (22c): despite they are not agricultural products, there is no other variable where fishery products can be included.

Variable	22 Agricultural products
Sub-variable	
Task 4.5 code	4
Dataset name	DG AGRI-JRC Production, trade and apparent use
Description	The dataset contains data on estimate production of meat, crops, dairy products, olive oil and wine, at member states level.
Data provider	JRC
URL	http://data.europa.eu/89h/33243e5e-44a1-4b43-9444-31d64dc7921f
API link	https://agridata.ec.europa.eu/extensions/DataPortal/API_Documentation.html
File name original	Dataset_DG_AGRJ-JRC_-_Production__trade_and_apparent_use__EU-27__
Unit	Tons/hecolitres/ha
Spatial resolution	NUTS 0
Spatial coverage	
Temporal resolution	Annual
Temporal coverage	2002 - 2021
T4_2 file name	22_AgriculturalProducts_Dataset_JRC
Export options	7 Commodities: Crops, Milk, Dairy, Meat, Live animals, Olive oil, Wine. Categories: Production/Trade/Apparent use of different agricultural commodities (total of 16 categories). Geopolitical entity: EU 28/EU 27 - on the level of individual countries. Time: yearly from 2002.
Note	The dataset is updated 3 times per year, at every new release of the DG AGRI Short-term outlook. Dashboard and data in csv format available.

Variable	22 Agricultural products
Sub-variable	22a_Plant production
Task 4.5 code	04
Dataset name	Crop production in EU standard humidity by NUTS 2 regions
Description	The dataset contains data on plant production – area for individual types of crops.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/APRO_CPSHR_custom_1872022/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	APRO_CPSHR
Unit	1000 ha
Spatial resolution	NUTS2
Spatial coverage	EU28 + some other European countries
Temporal resolution	Annual
Temporal coverage	2000-2021
T4_2 file name	22a_Crop production_Eurostat_NUTS2.xlsx
Export options	GEO: 634 regions. Crops: 79 types. Time: 22 years. Structure of production: 5 types – area, harvested production, yield, main area, EU standard humidity.
Note	n/a

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production of meat: sheep and goats
Description	This indicator covers the carcass weight of sheep, including lambs, and goats slaughtered in slaughterhouses or elsewhere whose meat is declared fit for human consumption.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tag00045/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TAG00045
Unit	Thousand tonnes
Spatial resolution	NUTS1
Spatial coverage	EU19 (from 2015), EU 27 (from 2007-2013), EU 28 (from 2020)
Temporal resolution	Annual
Temporal coverage	2010-2021
T4_2 file name	
Export options	Meat product: 1 options. Geopolitical entity: 43 (NUTS0-NUTS1). Time: 2010-2021 (12 years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Meat production and foreign trade - head - monthly data
Description	This indicator cover the meat production and foreign trade - head - monthly data (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/APRO_MT_PHEADM/default/table?lang=en&category=agr.apro.apro_anip.apro_mt.apro_mt_p
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/

File name original	APRO_MT_PHEADM
Unit	Thousand tonnes [THS_T] Thousand heads (animals) [THS_HD]
Spatial resolution	NUTS1
Spatial coverage	EU27 + other countries
Temporal resolution	Monthly
Temporal coverage	1950-2021
T4_2 file name	
Export options	Meat product: 27 options, Item of meat: 1 option. Geopolitical entity: 42 (NUTS0-NUTS1). Time: 1950-2021 (864 months)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production of meat: cattle
Description	This indicator covers the carcass weight of bovine animals (calves, bullocks, bulls, heifers and cows) slaughtered in slaughterhouses and on the farm, whose meat is declared fit for human consumption
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tag00044/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TAG00044
Unit	Thousand tonnes
Spatial resolution	NUTS1
Spatial coverage	EU19 (from 2015), EU 27 (from 2007-2013), EU 28 (from 2020)
Temporal resolution	Annual
Temporal coverage	2010-2021 (12 years)
T4_2 file name	
Export options	Meat product: 1 option. Geopolitical entity: 43 (NUTS0-NUTS1). Time: 2010-2021 (12 years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production of meat: pigs
Description	This indicator expresses the total carcass weight of pigs slaughtered in slaughterhouses and on the farm, whose meat is declared fit for human consumption.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tag00042/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TAG00042
Unit	Thousand tonnes
Spatial resolution	NUTS1
Spatial coverage	EU19 (from 2015), EU 27 (from 2007-2013), EU 28 (from 2020)
Temporal resolution	Annual
Temporal coverage	2010-2021
T4_2 file name	
Export options	Meat product: 1 option. Geopolitical entity: 43 (NUTS0-NUTS1). Time: 2010-2021 (12 years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production of meat: poultry
Description	Total carcass weight of poultry slaughtered whose meat is declared fit for human consumption. The following poultry is included: hens, chicken, ducks, turkey, guinea fowls, geese. This indicator covers mainly the production of gallinaceae including broilers.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tag00043/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TAG00043
Unit	Thousand tonnes
Spatial resolution	NUTS1
Spatial coverage	EU19 (from 2015), EU 27 (from 2007-2013), EU 28 (from 2020)
Temporal resolution	Annual
Temporal coverage	2010-2021
T4_2 file name	
Export options	Meat product: 1 option. Geopolitical entity: 43 (NUTS0-NUTS1). Time: 2010-2021 (12 years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production of eggs for consumption and number of laying hens
Description	This indicator covers the production of eggs for consumption and number of laying hens.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/APRO_EC_EGGHEN/default/table?lang=en&category=agr.apro.apro_anip.apro_ec
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	APRO_EC_EGGHEN
Unit	Thousand [THS]
Spatial resolution	NUTS 1
Spatial coverage	EU – 25
Temporal resolution	Annual
Temporal coverage	2013-2020
T4_2 file name	
Export options	Agricultural products: 1 option. Geopolitical entity: 26 (NUTS1). Time: 2013-2020 (8years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production of cow's milk on farms by NUTS 2 regions
Description	Statistics on the production of cow's milk are derived from annual surveys of farms in each Member State. Milk production here includes milk subsequently fed to calves on the same farm, but not milk suckled directly (NUTS2).

Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tgs00046/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TGS00046
Unit	1000 tonne
Spatial resolution	NUTS2-NUTS3
Spatial coverage	EU - 27
Temporal resolution	Annual
Temporal coverage	2009-2020
T4_2 file name	
Export options	Milk product: Item of milk-1 option, Dairy and other animal products (except meat)-1 option. Geopolitical entity: 394 (NUTS 2). Time: 2009-2020 (12 years)

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Milk collection (all milks) and dairy products obtained - annual data
Description	This indicator cover the milk collection (all milks) and dairy products obtained - annual data (NUTS1)
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/apro_mk_pobta/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	APRO_MK_POBTA
Unit	1000 tonne (milk)
Spatial resolution	NUTS1
Spatial coverage	EU 27 countries (from 2020) , EU 28 countries (2013-2020)
Temporal resolution	Annual
Temporal coverage	1960-2020
T4_2 file name	
Export options	Milk product: Dairy and other animal products (except meat) – 86 options, Item of milk - 5 option. Geopolitical entity: 38 (NUTS0-NUTS1). Time: 1960-2020 (61 years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Cows' milk collection and products obtained - annual data
Description	This indicator cover the cows 'milk collection and products obtained - annual data (NUTS1)
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/apro_mk cola/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	APRO_MK_COLA
Unit	1000 tonne
Spatial resolution	NUTS1
Spatial coverage	EU 27 countries (from 2020), EU 28 countries (2013-2020) , EU 27 countries (2007-2013) , EU 25 countries (2004-2006) , EU 15 countries (1995-2004)
Temporal resolution	Annual
Temporal coverage	1968-2021
T4_2 file name	

Export options	Milk product: Dairy and other animal products (except meat), 10 options. Geopolitical entity: 44 (NUTS0-NUTS1). Time: 1968-2021 (54 years)
Note	

Variable	22 Agricultural products
Sub-variable	22b_animal production
Task 4.5 code	4
Dataset name	Production and utilization of milk on the farm - annual data
Description	This indicator cover the production and utilization of milk on the farm - annual data (NUTS 1)
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/APRO_MK_FARM/default/table?lang=en&category=agr.apro.apro_anip.apro_mk
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	APRO_MK_FARM
Unit	1000 tonne
Spatial resolution	NUTS1
Spatial coverage	EU 27 countries (from 2020) , EU 28 countries (2013-2020) , EU 25 countries (2004-2006) + other countries
Temporal resolution	Annual
Temporal coverage	1960-2020
T4_2 file name	
Export options	Dairy and other animal products (except meat): 29 options, Item of milk: 3 options. Geopolitical entity: 44 (NUTS0-NUTS1). Time: 1960-2020 (61 years)
Note	

Variable	22 Agricultural products
Sub-variable	22c_fishery products
Task 4.5 code	4
Dataset name	Catches in all fishing regions
Description	This indicator cover the catches in all fishing regions (NUTS1)
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tag00076/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TAG00076
Unit	Tonnes live weight [TLW]
Spatial resolution	NUTS 1
Spatial coverage	EU 27 (from 2020) [EU27_2020], EU 28 countries (2013-2020) , EU 19 countries (from 2015)
Temporal resolution	Annual
Temporal coverage	2009-2020
T4_2 file name	
Export options	Species: 1 option, Fishing regions: 1 option. Geopolitical entity: 40 (NUTS0-NUTS1). Time: 2009-2020 (12 years)
Note	

Variable	22 Agricultural products
Sub-variable	22c_fishery products
Task 4.5 code	4
Dataset name	Catches - major fishing areas (from 2000 onwards)
Description	This indicator cover the catches - major fishing areas (from 2000 onwards) /NUTS1/

Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FISH_CA_MAIN/default/table?lang=en&category=fish.fish_ca
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FISH_CA_MAIN
Unit	Tonnes live weight [TLW]
Spatial resolution	NUTS 1
Spatial coverage	EU 27 countries (from 2020) , EU 28 countries (2013-2020)
Temporal resolution	Annual
Temporal coverage	2000-2020
T4_2 file name	
Export options	Species: 1500 options, Fishing regions: 8 option. Geopolitical entity: 29 (NUTS0-NUTS1) Time: 2000-2020 (21 years).
Note	

Variable	22 Agricultural products
Sub-variable	22c_fishery products
Task 4.5 code	4
Dataset name	Catches - major fishing areas
Description	This indicator cover the catches - major fishing areas (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FISH_CA_MAIN_H/default/table?lang=en&category=fish.fish_ca.fish_ca_h
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FISH_CA_MAIN_H
Unit	Tonnes live weight [TLW]
Spatial resolution	NUTS 1
Spatial coverage	EU 27 countries (2007-2013) , EU 25 countries (2004-2006) , EU 15 countries (1995-2004)
Temporal resolution	Annual
Temporal coverage	1950-1999
T4_2 file name	
Export options	Species: 954 options, Fishing regions: 23 options. Geopolitical entity: 45 (NUTS0-NUTS1). Time: 1950-1999 (50 years)
Note	

Variable	22 Agricultural products
Sub-variable	22c_fishery products
Task 4.5 code	4
Dataset name	Aquaculture production in quantities (1984-2007) - tonnes live weight
Description	This indicator cover the aquaculture production in quantities (1984-2007) - tonnes live weight (NUTS1)
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FISH_AQ_Q/default/table?lang=en&category=fish.fish_aq.fish_aq08
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FISH_AQ_Q
Unit	Tonnes live weight [TLW]
Spatial resolution	NUTS 1
Spatial coverage	EU 27 countries (2007-2013) , EU 25 countries (2004-2006) , EU 15 countries (1995-2004)
Temporal resolution	Annual

Temporal coverage	1984-2007
T4_2 file name	
Export options	Species: 226 options, Fishing regions: 9 options, Aquatic environment : 1 option Geopolitical entity: 48 (NUTS0-NUTS1). Time: 1984-2007 (24 years)
Note	

Variable	22 Agricultural products
Sub-variable	22c_fishery products
Task 4.5 code	4
Dataset name	Landings of fishery products - main data
Description	This indicator cover the Landings of fishery products - main data (NUTS 1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FISH_LD_MAIN/default/table?lang=en&category=fish.fish_ld
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FISH_LD_MAIN
Unit	Eur
Spatial resolution	NUTS 0, NUTS1
Spatial coverage	EU6-1958, EU9-1973, EU10-1981, EU12-1986, EU15-1995, EU25-2004, EU27-2007, EU28-2013, EU27-2020) , EU 27 countries (from 2020), EU 28 countries (2013-2020)
Temporal resolution	Annual
Temporal coverage	2000-2020
T4_2 file name	
Export options	Species: 1427 options, Presentation form:1 option, Nationality of registration of vessel:1 option, Fish destination and use: 3 options. Geopolitical entity: 29 (NUTS0-NUTS1). Time: 2000-2020 (21 years)

23 Harvest (cropland, grassland, forest)

Variable	23 Harvest (cropland, grassland, forest)
Sub-variable	n/a
Task 4.5 code	5
File name original	JRC Biomass_estimates
Description	Database quantifies the production and residues of agricultural biomass. The scope of the database is all agricultural commodities for each of the 28 EU Member states
Data provider	JRC
URL	https://data.jrc.ec.europa.eu/dataset/jrc-datam-biomass-estimates
API link	
Dataset name	DataM, biomass estimates
File name original	Dataset_JRC_-_Biomass_estimates
Unit	Tonnes/Ha/Hectolitres/Heads
Spatial resolution	NUTS 0
Spatial coverage	EU28
Temporal resolution	Annual
Temporal coverage	1961 - 2014
T4_2 file name	23_Harvest_Dataset_JRC_BiomasEstimates
Export options	Country (EU Countries, EU 13, EU-15, EU-27, EU-28). Attribute - 9 options: (Domestic extraction used, domestic extraction total, harvested area, production, residues non-used, residues used, residues total, yield, yield domestic extraction used. Unit - 10 options. Comodity - all agricultural commodities (159 options). Version - 3 options. Year (1961 - 2014).
Note	Dashboard and data in csv format available.

Variable	23 Harvest (cropland, grassland, forest)
Sub-variable	23a_Harvest – agriculture
Task 4.5 code	04
Dataset name	Crop production in EU standard humidity by NUTS 2 regions
Description	The dataset contains data on harvested plant production – both crops and grasslands by NUTS2 regions.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/APRO_CPSHR_custom_1872022/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	APRO_CPSHR
Unit	1000 t
Spatial resolution	NUTS2
Spatial coverage	EU28 + some other European countries
Temporal resolution	Annual
Temporal coverage	2000-2021
T4_2 file name	23a_Plant harvest_Eurostat_NUTS2.xlsx
Export options	GEO: 634 regions. Crops: 79 types. Time: 22 years. Structure of production: 5 types – area, harvested production, yield, main area, EU standard humidity.
Note	n/a

Variable	23 Harvest (cropland, grassland, forest) (t/ha)
Sub-variable	23b_Harvest - forestry
Task 4.5 code	5
Dataset name	Roundwood, fuelwood and other basic products
Description	This indicator cover the roundwood, fuelwood and other basic products (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/for_basic/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FOR_BASIC
Unit	Thousand cubic metres [THS_M3]
Spatial resolution	NUTS 1
Spatial coverage	EU 27 countries (from 2020), EU 28 countries (2013-2020)
Temporal resolution	Annual
Temporal coverage	1988-2020
T4_2 file name	
Export options	Wood products: 11 options, Tree species: 4 options, Stock or flow: 5 options, Species: 1 Geopolitical entity: 34 (NUTS0-NUTS1). Time: 1988-2020 (33 years)
Note	

Variable	23 Harvest (cropland, grassland, forest) (t/ha)
Sub-variable	23b_Harvest - forestry
Task 4.5 code	5
Dataset name	Roundwood removals by type of wood and assortment
Description	Removals of roundwood comprise all quantities of wood felled and removed from the forest and other wooded land or other felling sites. This indicator cover the eoundwood removals by type of wood and assortment (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FOR_REMOV/default/table?lang=en&category=for.for_rpt.for_rptr

API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FOR_REMOV
Unit	Thousand cubic metres [THS_M3]
Spatial resolution	NUTS 1
Spatial coverage	EU 27 countries (from 2020), EU 28 countries (2013-2020)
Temporal resolution	Annual
Temporal coverage	1988-2020
T4_2 file name	
Export options	Tree species: 3 options, Wood products: 6 options, Under bark / over bark: 2 options, Geopolitical entity: 34 (NUTS0-NUTS1). Time: 1988-2020 (33 years)
Note	

Variable	23 Harvest (cropland, grassland, forest) (t/ha)
Sub-variable	23b_Harvest - forestry
Task 4.5 code	5
Dataset name	Roundwood removals under bark by type of ownership
Description	Removals of roundwood comprise all quantities of wood felled and removed from the forest and other wooded land or other felling sites. This indicator cover the roundwood removals under bark by type of ownership (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FOR_OWNER/default/table?lang=en&category=for.for_rpt.for_rptr
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FOR_OWNER
Unit	Thousand cubic metres [THS_M3]
Spatial resolution	NUTS 1
Spatial coverage	EU – 27 + other countries
Temporal resolution	Annual
Temporal coverage	1992-2020
T4_2 file name	
Export options	Tree species: 3 options, Type of ownership: 3 options. Geopolitical entity: 31 (NUTS1) Time: 1992-2020 (29 years)
Note	

Variable	23 Harvest (cropland, grassland, forest) (t/ha)
Sub-variable	23b_Harvest - forestry
Task 4.5 code	5
Dataset name	Industrial roundwood by assortment
Description	This indicator covers the industrial roundwood by assortment (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FOR_IRASS/default/table?lang=en&category=for.for_rpt.for_rptt
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FOR_IRASS
Unit	Thousand euro [THS_EUR], Thousand units of national currency [THS_NAC] Thousand cubic metres [THS_M3]
Spatial resolution	NUTS 1
Spatial coverage	EU – 27 + other countries
Temporal resolution	Annual
Temporal coverage	1992-2020
T4_2 file name	

Export options	Tree species: 4 options, Wood products: 2 options, Stock or flow: 2 options, Geopolitical entity: 32 (NUTS1), Time: 1992-2020 (28 years)
Note	

Variable	23 Harvest (cropland, grassland, forest) (t/ha)
Sub-variable	23b_Harvest - forestry
Task 4.5 code	5
Dataset name	Industrial roundwood by species
Description	This indicator cover the industrial roundwood by species (NUTS1).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/FOR_IRSPEC/default/table?lang=en&category=for.for_rpt.for_rptt
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	FOR_IRSPEC
Unit	Thousand euro [THS_EUR], Thousand units of national currency [THS_NAC] Thousand cubic metres [THS_M3]
Spatial resolution	NUTS 1
Spatial coverage	EU – 27 + other countries
Temporal resolution	Annual
Temporal coverage	1992-2020
T4_2 file name	
Export options	Tree species: 11 options, Wood products: 1 option, Stock or flow: 2 options, Geopolitical entity: 32 (NUTS1). Time: 1992-2020 (29 years)
Note	

26 Basic services provision: health & education

Variable	26 Basic services provision: health & education
Sub-variable	26a Health
Task 4.5 code	8
Dataset name	Hospital beds by NUTS 2 regions
Description	The dataset provides information on number of beds in hospitals for 6 different bed types for NUTS2 regions.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/HLTH_RS_BDSRG__custom_1861424/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	HLTH_RS_BDSRG
Unit	Number; inhabitants per bed; per hundred thousand inhabitants
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	yearly
Temporal coverage	1996-2019
T4_2 file name	26a1_Beds in hospitals_Eurostat_NUTS2.xlsx
Export options	GEO: 368 regions; health facility: available hospital beds and 5 types of hospital beds; units of measure: 3 types (see Unit above)
Note	2020 data are not available

Variable	26 Basic services provision: health & education
Sub-variable	26a Health
Task 4.5 code	8
Dataset name	Health personnel by NUTS 2 regions
Description	The dataset provides information on health personnel in NUTS2 region.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/HLTH_RS_PRSRG_custom_1861637/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	HLTH_RS_PRSRG
Unit	Number; inhabitants per...; per hundred thousand inhabitants
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	yearly
Temporal coverage	1996-2019
T4_2 file name	26a2_Medical doctors_Eurostat_NUTS2.xlsx
Export options	GEO: 365 regions; five categories of health personnel (ISCO-08); units of measure: 3 types (see Unit above)
Note	Despite it is possible to select 5 categories of health personnel, data are available only for one category: medical doctors. 2020 data are not available

28 Land cover (CORINE)

Note: The land cover data could be extracted from different sources, therefore better name for this variable is “Land cover”. We extracted also data from LUCAS (Land Use and Cover Area frame Survey) and labelled them as sub-variable “28a Land cover – LUCAS”.

Variable	28 Land cover
Sub-variable	28a Land cover – LUCAS
Task 4.5 code	10
Dataset name	Land cover overview by NUTS 2 regions
Description	The dataset contains data on land cover for NUTS2 regions and 2009, 2012, 2015, 2018 years.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/LAN_LCV_OVW_custom_1787651/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_LCV_OVW
Unit	km ² , percentage, coefficient of variation for absolute value
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	2009, 2012, 2015, 2018
Temporal coverage	2009-2018
T4_2 file name	28a_Land cover – LUCAS_Eurostat_NUTS2.xlsx
Export options	Land cover: 83 options. Geopolitical entity: 445 units (NUTS0-NUTS2). Time: 4 options (2009, 2012, 2015, 2018). Units of measure: km ² , percentage, coefficient of variation for absolute value
Note	

Variable	28 Land cover
Sub-variable	28a Land cover – LUCAS
Task 4.5 code	10
Dataset name	Primary data / LUCAS micro data 2006, 2009, 2012, 2015, 2018
Description	The dataset contains LUCAS Micro-data: land cover and environmental variables associated with the individual points surveyed. Point and landscape photos in the 4 cardinal directions Soil data (not collected in every settlement area for NUTS and 2009, 2012, 2015, 2018 years).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/web/lucas/data/primary-data
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	n/a
Unit	Land cover class
Spatial resolution	NUTS0-NUTS3, points
Spatial coverage	EU28
Temporal resolution	2006, 2009, 2012, 2015, 2018
Temporal coverage	2006-2018
T4_2 file name	28a_Land cover_LUCAS_2018_Microdata_Eurostat_points.xlsx
Export options	Land cover: 83 options. Geopolitical entity: 11 in 2006, 23 in 2009, 27 in 2012, 28 in 2018. Time: 5 options (2006, 2009, 2012, 2015, 2018)
Note	

Variable	28 Land cover
Sub-variable	28a Land cover – LUCAS
Task 4.5 code	10
Dataset name	Land covered by artificial surfaces by NUTS 2 regions
Description	This dataset contains data on artificial substrates per NUTS2 regions. Nine types of artificial substrates are distinguished.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/lan_lcv_art/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_LCV_ART
Unit	km2, percentage, m2 per capita, coefficient of variation for absolute value
Spatial resolution	NUTS2
Spatial coverage	EU28
Temporal resolution	2009, 2012, 2015, 2018
Temporal coverage	2009-2018
T4_2 file name	28a_Land cover – LUCAS_artificial substrates_Eurostat_NUTS2.xlsx
Export options	Geopolitical entity: 445 units (NUTS0-NUTS2). Land cover: 11 categories: total land cover, artificial land and 9 categories of artificial land. Time: 4 options (2009, 2012, 2015, 2018). Units of measure: km ² , percentage, m2 per capita, coefficient of variation for absolute value
Note	

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Settlement area
Description	The dataset contains data on settlement area on country level for EU28
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/lan_settl/default/table?lang=en

API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_SETTL
Unit	Square metres per capita; Square kilometre; Indices
Spatial resolution	countries
Spatial coverage	EU28
Temporal resolution	2009, 2012, 2015, 2018
Temporal coverage	2009-2018
T4_2 file name	_Eurostat_NUTS2.xlsx
Export options	GEO: 32 options; Measure unit – 7 options: Square metres per capita; Square kilometre; Index, 2015=100; Index, 2012=100; Index, 2009=100; Coefficient of variation for absolute value.
Note	

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Forest cover – forest and other wooded land
Description	The dataset contains data about the forests and other woody lands from the 2010 in countries included in the MCPFE Report 2011. These variables are in units: 1000 hectares, percentages and hectares per capita.
Data provider	European Forest Institute
URL	http://dataservices.efi.int/ltfra/data.php?group=504&land%5B%5D=13001&land%5B%5D=13002&land%5B%5D=13003&source=504
API link	
File name original	ltfra.160607
Unit	1000 ha, %, ha per capita
Spatial resolution	Countries
Spatial coverage	
Temporal resolution	2010
Temporal coverage	2010
T4_2 file name	28a_ForestCover_EFI_2010
Export options	Forest & OWL: per Capita, Th.ha, % of land area; Countries included in the MCPFE Report 2011
Note	

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Forest Land cover for FAO Forest categories by NUTS 2 regions
Description	The dataset contains the forest land cover data using FAO classification (4 classes) for NUTS2 regions
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/lan_lcv_fao/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_LCV_FAO
Unit	Square kilometre; Percentage
Spatial resolution	NUTS 2
Spatial coverage	EU27 + some other European countries
Temporal resolution	2009, 2012, 2015, 2018
Temporal coverage	2009-2018
T4_2 file name	

Export options	GEO: 445 regions; Land cover – 4 options: Total land cover, Forest FAO, Other wooded land FAO, Other wooded land no FAO; Time – 4 options: 2009, 2012, 2015, 2018; Unit of measure - 3 options: Square kilometre; Coefficient of variation for absolute value; Percentage
Note	

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Global Surface Water Explorer dataset
Description	This dataset maps the location and temporal distribution of water surfaces at the global scale and provides statistics on the extent and change of those water surfaces
Data provider	JRC
URL	http://data.europa.eu/89h/jrc-gswe-global-surface-water-explorer-v1
API link	
File name original	
Unit	
Spatial resolution	30 m
Spatial coverage	Global
Temporal resolution	
Temporal coverage	1984-2020
T4_2 file name	
Export options	Water occurrence (1984-2020); Water occurrence change intensity (1984-1999 to 2000-2020); Water seasonality (2020). Annual water recurrence (1984-2020). Water transitions (first year to last year). Maximum water extent (1984-2020). Background layers (Earth time-lapse, world map, satellite, white).
Note	Map. Data download available.

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Green infrastructure percentage by NUTS2 and NUTS3 regions
Description	The indicator shows the coverage percentage of Green Infrastructure (GI) within each region at NUTS 2/3 level in Europe
Data provider	ESPON
URL	https://database.espon.eu/maindata/#/?id=1025
API link	
File name original	ind_1025_spgi_ind_data.csv
Unit	Percentage
Spatial resolution	NUTS2, NUTS3
Spatial coverage	EU28 + some other European countries
Temporal resolution	2012
Temporal coverage	2012
T4_2 file name	
Export options	No options to be selected
Note	

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Forest area

Description	Surface of forest area as defined in Corine Land Cover Level 2 category "Forests". Value calculated as the ratio over total NUTS3 surface
Data provider	ESPON
URL	https://database.espon.eu/maindata/#/
API link	
File name original	ind_1612_for_area_data.csv
Unit	Percentage
Spatial resolution	NUTS3
Spatial coverage	EU28 + 4 other European countries
Temporal resolution	6-years period: 2000, 2006, 2012, 2018
Temporal coverage	2000-2018
T4_2 file name	
Export options	No options to be selected
Note	

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Intensity of urban fabric
Description	Share of urban fabric in artificial areas
Data provider	ESPON
URL	https://database.espon.eu/maindata/#/
API link	
File name original	ind_2026_uf_art_data.csv; uf_art
Unit	Percentage; ha (urban fabric) / ha (all artificial)
Spatial resolution	NUTS3
Spatial coverage	EU28 + some other European countries
Temporal resolution	2016
Temporal coverage	2016
T4_2 file name	
Export options	No options to be selected
Note	CORINE LC classes: Urban fabric: 111, 112; artificial areas: urban fabric: 111, 112; industrial: 121; infrastructure: 122, 123, 124; mine and dump sites: 131, 132; construction sites: 133; urban green: 141, 142.

Variable	28 Land cover
Sub-variable	n/a
Task 4.5 code	10
Dataset name	Soil sealing
Description	Land cover indicators derived from CORINE satellite data
Data provider	ESPON
URL	https://database.espon.eu/maindata/#/
API link	
File name original	soi_seal
Unit	ha
Spatial resolution	NUTS3
Spatial coverage	EU28
Temporal resolution	2000, 2006, 2012, 2018
Temporal coverage	2000-2018
T4_2 file name	
Export options	No options to be selected
Note	

29 Land use change (CORINE)

Modified to: 29 Land cover and land use change

Note: CORINE Land Cover provides data for land cover, not for land use. Therefore, CORINE Land Cover data can be used only for land cover change, they cannot be used for land use change. The variable “Land cover change” currently is not among eLTER Standard Variables. Until it is added, we include to variable 29 both land cover change and land use change.

Variable	29 Land cover and land use change
Sub-variable	29a Land cover change
Task 4.5 code	n/a
Dataset name	Land covered by artificial surfaces - index
Description	The dataset contains data on artificial surfaces as index expressing change against previous time horizon for NUTS0. It is possible to select different years as basis for the index.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/LAN_LCV_ARTI__custom_1792117/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_LCV_ARTI
Unit	Index
Spatial resolution	NUTS0
Spatial coverage	EU28
Temporal resolution	Annual
Temporal coverage	2009-2018
T4_2 file name	29a_Land cover_artificial_surface_index_LUCAS_Eurostat_NUTS0.xlsx
Export options	Geopolitical entity: 32 units (EU27, EU28, countries). Time: 4 options (2009, 2012, 2015, 2018). Units of measure: 3 options: Index, 2015=100; Index, 2012=100; Index, 2009=100.
Note	

Variable	29 Land cover and land use change
Sub-variable	29b Land use change
Task 4.5 code	11
Dataset name	Scenar 2030 Dashboards by Model
Description	Data-Modelling platform of resource economics. Interactive infographics and dashboards predict impact of CAP on the agricultural sector of stylised scenarios, reflecting the main drivers of policy debate. Modelled variable: Land use.
Data provider	JRC
URL	https://datam.jrc.ec.europa.eu/datam/mashup/SCENAR2030_DASHBOARDS/
API link	
File name original	
Unit	Changes in %
Spatial resolution	NUTS 0, NUTS2
Spatial coverage	EU28
Temporal resolution	2016, 2030
Temporal coverage	2016 - 2030
T4_2 file name	n/a
Export options	3 models: CAPRI Model, IFM - CAP Model, MAGNET Model
Note	Dashboards available.

30 Land use (Statistics)

Variable	30 Land use
Sub-variable	n/a
Task 4.5 code	12
Dataset name	Land use overview by NUTS 2 regions
Description	The dataset contains data on land use (19 categories) in NUTS2 regions.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/lan_use_ovw/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_USE_OVW
Unit	Km2, percentage
Spatial resolution	NUTS2
Spatial coverage	EU28
Temporal resolution	2009, 2012, 2015, 2018
Temporal coverage	2009-2018
T4_2 file name	30a_Land use – LUCAS_Eurostat_NUTS2_km2.xlsx; 30a_Land use – LUCAS_Eurostat_NUTS2_percent.xlsx
Export options	GEO: 445 regions; Land use – 19 options: Total land use, Agriculture, Forestry, Fishing and aquaculture, Land use with heavy environmental impact, Services and residential area, Unused and abandoned areas, Other primary sector activities, Mining and quarrying, Energy production, Industry and manufacturing, Water and waste treatment, Construction, Transport, telecommunication, energy distribution, storage, protective works; Commercial, financial, professional and information services; Community services; Arts, entertainment and recreation; Residential area; Nature reserves; Time – 4 options: 2009, 2012, 2015, 2018; Unit of measure - 3 options: Square kilometre; Coefficient of variation for absolute value; Percentage
Note	Data for some years only are available.

Variable	30 Land use
Sub-variable	30a Land use - LUCAS
Task 4.5 code	12
Dataset name	Primary data / LUCAS micro data 2006, 2009, 2012, 2015, 2018
Description	The dataset contains LUCAS Micro-data: land use and environmental variables associated with the individual points surveyed. Point and landscape photos in the 4 cardinal directions. Soil data (not collected in every settlement area for NUTS and 2006, 2009, 2012, 2015, 2018 years)
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/web/lucas/data/primary-data
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	
Unit	Land use class
Spatial resolution	NUTS0 - NUTS3, point
Spatial coverage	EU28
Temporal resolution	3 years
Temporal coverage	2006-2018
T4_2 file name	28a_Land cover_LUCAS_2018_Microdata_Eurostat_points.xlsx (file contains data on both land cover and land use)
Export options	Land use: 40 options. Geopolitical entity: 11 in 2006, 23 in 2009, 27 in 2012, 28 in 2018. Time: 5 options (2006, 2009, 2012, 2015, 2018)
Note	n/a

34 NUTS3 and Local Administrative Units (LAU) spatial databases

This variable is not typical for official statistics. The respective GIS layers for NUTS and LAU are available at: <https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units>. **Note:** NUTS and LAU layers are available for individual years and if they are combined with statistical data, the layer for the respective year should be used.

In the same website are available also other spatial data layers - for Urban audit, Census 2011, Coastal lines, Communes and Countries.

The correspondence tables between LAU and NUTS units are available at: <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units>

Variable	34 NUTS and LAU spatial databases
Sub-variable	34a NUTS spatial databases
Task 4.5 code	16
Dataset name	NUTS spatial databases
Description	The NUTS are a hierarchical system divided into 3 levels. NUTS 1: major socio-economic regions, NUTS 2: basic regions for the application of regional policies, NUTS 3: small regions for specific diagnoses. Additionally a NUTS 0 level, usually co-incident with national boundaries are also available. The NUTS legislation is periodically amended; therefore multiple years are available for download.
Data provider	Eurostat, GISCO
URL	https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units
API link	https://gisco-services.ec.europa.eu/distribution/v2/nuts/ https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	Different, for 2021: NUTS_RG_20M_2021_3035.shp.zip
Unit	n/a
Spatial resolution	Scale: 01M, 03M, 10M, 20M, 60M.
Spatial coverage	EU27 + some other European countries
Temporal resolution	n/a
Temporal coverage	2003-2021
T4_2 file name	NUTS_RG_20M_2021_3035.shp.zip
Export options	File format: shp, TopoJSON, GeoJSON, PBF, SVG. Scale: 01M, 03M, 10M, 20M, 60M. Coordinate reference system: EPSG: 3035, EPSG: 4326, EPSG: 3857.
Note	n/a

Variable	34 NUTS and LAU spatial databases
Sub-variable	34b LAU spatial databases
Task 4.5 code	16
Dataset name	Local Administrative Units
Description	Local administrative units (LAUs) are low level administrative divisions of a country below that of a province, region or state. Not all countries classify their locally governed areas in the same way and LAUs may refer to a range of different administrative units, including municipalities, communes, parishes or wards.
Data provider	Eurostat, GISCO
URL	https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units
API link	https://gisco-services.ec.europa.eu/distribution/v2/lau/ https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/

File name original	Different, for 2020: ref-lau-2020-01m.shp.zip
Unit	n/a
Spatial resolution	n/a
Spatial coverage	EU28 + some other European countries
Temporal resolution	Annual
Temporal coverage	2011-2020
T4_2 file name	ref-lau-2020-01m.shp.zip
Export options	File format: shp, TopoJSON, GeoJSON, GDB, SVG.
Note	Until 2016, two levels of Local Administrative Units (LAU) existed: 1) the upper LAU level (LAU level 1, formerly NUTS level 4) were defined for most, but not all of the countries; 2) the lower LAU level (LAU level 2, formerly NUTS level 5) consisted of municipalities or equivalent units in the 28 EU Member States. Since 2017, only one level of LAU has been kept. Since there are frequent changes to the LAUs, Eurostat publishes an updated list towards the end of each year.

35 Per capita income / GDP per capita

Variable	35 GDP per capita
Sub-variable	n/a
Task 4.5 code	17
Dataset name	Gross domestic product (GDP) at current market prices by NUTS 3 regions
Description	The datasets contains information on Gross domestic product by NUTS3 regions. Expression in absolute value in EUR and national currency, per capita, per capita as percentage of EU27 average, in purchasing power standard.
Data provider	Eurostat
URL	https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_10r_3gdp&lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	nama_10r_3gdp
Unit	Euro per inhabitant
Spatial resolution	NUTS3
Spatial coverage	EU27 + some other European countries
Temporal resolution	year
Temporal coverage	2000-2019
T4_2 file name	35_ GDP per capita_Eurostat_NUTS3.xlsx
Export options	GEO: 1789 regions; Units: Million Euro, Euro per inhabitant, Euro per inhabitant in percentage of the EU27 (from 2020) average, Million units of national currency, Million purchasing power standards, Purchasing power standard (PPS, EU27 from 2020), per inhabitant, Purchasing power standard (PPS, EU27 from 2020), per inhabitant in percentage of the EU27 (from 2020) average
Note	

Variable	35 GDP per capita
Sub-variable	n/a
Task 4.5 code	17
Dataset name	GDP/inhabitant in % of EU average (%)
Description	The dashboard shows data on GDP per inhabitant in % of EU average (%) in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	
Unit	%

Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	2000-2019
T4_2 file name	
Export options	In section "Economy" are 20 options - among them is "GDP/inhabitant in % of EU average (%)" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

Variable	35 GDP per capita
Sub-variable	n/a
Task 4.5 code	17
Dataset name	Primary income of private households by NUTS 2 regions
Description	The dataset contains information about primary income of private households in term of purchasing power standard.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tgs00036/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TGS00036; NAMA_10R_2HHINC
Unit	Purchasing power standard
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	annual
Temporal coverage	2008-2019
T4_2 file name	
Export options	GEO: 246 regions; Direction of flow: balance.
Note	

36 Population age profile

Variable	36 Population age profile
Sub-variable	n/a
Task 4.5 code	18
Dataset name	Population age profile LAU
Description	The dataset provides data on population age profile at municipality level from national censuses. The age profile is provided by broad age groups, five-year groups and single-year groups.
Data provider	Eurostat
URL	https://ec.europa.eu/CensusHub2/query.do?step=selectHyperCube&qhc=false
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	
Unit	Number
Spatial resolution	Municipality (LAU), NUTS3, NUTS2, countries
Spatial coverage	EU27 + some other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	36_Population age profile_Eurostat_LAU.xlsx
Export options	GEO: 123 189 municipalities (LAU), Age: broad age groups (6 groups), five-year groups and single-year groups. Residence or Place of work.
Note	n/a

Variable	36 Population age profile
Sub-variable	n/a
Task 4.5 code	18
Dataset name	Population on 1 January by broad age group, sex and NUTS 3 region
Description	The dataset provides data on population age profile by NUTS3 regions. The age profile is provided by broad age groups. The same datasets contains besides age also information on sex profile.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/demo_r_pjanaggr3/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	DEMO_R_PJANAGGR3
Unit	Number
Spatial resolution	NUTS3
Spatial coverage	EU27 + some other European countries
Temporal resolution	Yearly
Temporal coverage	1990-2020
T4_2 file name	36_Population age profile_Eurostat_NUTS3.xlsx
Export options	GEO: 2 035 regions, Age: total, less than 15 years, from 15 to 64 years, 65 years and over, Unknown.
Note	n/a

Variable	36 Population age profile
Sub-variable	n/a
Task 4.5 code	18
Dataset name	Historical population
Description	This dataset presents annual population data from 1950 to 2020 by sex and five year age groups as well as the share of children, youth, the elderly, old-age and total dependency ratios. The data is available for all 38 OECD member countries as well as for the EU27 and G20 countries, Singapore and the World total.
Data provider	OECD.stat
URL	https://stats.oecd.org/Index.aspx?DataSetCode=HISTPOP#
API link	https://data.oecd.org/api/
File name original	n/a
Unit	number
Spatial resolution	NUTS0
Spatial coverage	OECD countries and other 14 countries
Temporal resolution	Annual
Temporal coverage	1950-2020
T4_2 file name	36_Populaiton_Age_OECDstat_NUTS0.xlsx
Export options	Country: 57 options (countries, EU27, G20, OECD, World). Age: 31 classes (5-year groups, 6 other age groups, elderly, children, youth, old age dependency ratio, total dependency ratio, working age, annual growth rate of total population). Time: 61 years (1950-2020). Sex: women, men, total.
Note	

Variable	36 Population age profile
Sub-variable	n/a
Task 4.5 code	18
Dataset name	Total population by age

Description	Total population by age (0-14, 15-64, over 64). The dashboard shows data on total population by age in 3 categories (0 to 14 years, 15 to 64 years and 65 years and over), in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	
Unit	Number
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	1990-2021
T4_2 file name	
Export options	In section "Population dynamics" are 12 options of demography - among them is "Total population by age" - with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

37 Population status of employment

Variable	37 Population status of employment
Sub-variable	n/a
Task 4.5 code	19
Dataset name	Population by current activity status, educational attainment level and NUTS 2 region
Description	The dataset contains data on status of employment for NUTS2 regions. Further divisions according sex and education are available. Data for year 2011.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/CENS_11AED_R2_custom_1442908/default/table
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	CENS_11AED_R2
Unit	Number
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	37_Population status of employment_Eurostat_NUTS2.xlsx
Export options	GEO: 488 regions. Activity and employment status: 6 classes (Population, Persons in labour force; Employed persons; Unemployed persons, persons outside of labour force, Unknown). Education: 10 classes (total, ISCED 1-6, Mo education, Not applicable, Unknown). Sex: total, males, females. Age: 28 classes (mostly 5-year classes).
Note	Data from 2011 census

Variable	37 Population status of employment
Sub-variable	n/a
Task 4.5 code	19
Dataset name	Total Employment (15-64)
Description	The dashboard shows data on number of employed persons of age 15-64 in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	

Unit	Number of persons
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	1999-2020
T4_2 file name	
Export options	In section "Labour market" are 20 options - among them is "Total Employment (15-64)" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

Variable	37 Population status of employment
Sub-variable	n/a
Task 4.5 code	19
Dataset name	Annual Labour Force Statistics Summary tables
Description	The "ALFS Summary tables" dataset is a subset of the Annual Labour Force Statistics database which presents annual labour force statistics for 38 OECD member countries, plus Brazil and Russian Federation and 4 geographical areas (Major Seven, Euro zone, European Union and OECD-Total). Data are presented in thousands of persons, in percentage or as indices with base year 2015=100.
Data provider	OECD
URL	https://stats.oecd.org/Index.aspx?DataSetCode=ALFS_SUMTAB
API link	https://data.oecd.org/api/
File name original	
Unit	thousands of persons; percentage; indices with base year 2015 (=100).
Spatial resolution	NUTS0
Spatial coverage	OECD countries, Brazil, Russia
Temporal resolution	Annual
Temporal coverage	1953 - 2021 (or earliest and latest available data)
T4_2 file name	
Export options	Country: 46 options. Subject: 37 options. Time and frequency: 69 individual years; time range from earliest to latest available data
Note	3 sub-datasets available: ALFS Summary tables; Annual labour force; Employment

Variable	37 Population status of employment
Sub-variable	37a Unemployment
Task 4.5 code	19
Dataset name	Total Unemployment (15-64)
Description	The dashboard shows data on unemployed persons (age 15-64) in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	
Unit	Number of persons
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	1999-2020
T4_2 file name	
Export options	In section "Labour market" are 20 options - among them is "Total Unemployment (15-64)" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

Variable	37 Population status of employment
Sub-variable	37b Employment by sectors
Task 4.5 code	19
Dataset name	Employment by sex, age, economic activity and NUTS 2 regions (NACE Rev. 2) (1 000)
Description	The dataset contains data on employment by sectors for NUTS2 regions, using NACE2 classification (10 categories). The data could be further structured by age group and sex.
Data provider	Eurostat
URL	https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfst_r_lfe2en2&lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	lfst_r_lfe2en2
Unit	Thousand
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	2008-2020
T4_2 file name	37_ Population employment by sectors_Eurostat_NUTS2.xlsx
Export options	GEO: 500 regions. NACE2: 10 categories (Total; Agriculture, forestry and fishing; Industry (except construction); Construction; Wholesale and retail trade, transport, accommodation and food service activities; Information and communication; Financial and insurance activities; Real estate activities; Professional, scientific and technical activities; administrative and support service activities; Public administration, defence, education, human health and social work activities; Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies; No response). Age: 6 categories (From 15 to 24 years; From 15 to 64 years; From 15 to 74 years; 15 years or over; From 25 to 64 years; From 65 to 74 years). Sex: Total, Males, Females.
Note	n/a

38 Population education attainment

Variable	38 Population education attainment
Sub-variable	n/a
Task 4.5 code	20
Dataset name	Population by educational attainment level, sex and NUTS 2 regions (%)
Description	Dataset provides information on education level (ISCED classification) for NUTS2 regions. Different age, sex, ISCED classes can be selected.
Data provider	EUROSTAT
URL	https://ec.europa.eu/eurostat/databrowser/view/EDAT_LFSE_04_custom_1861060/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	edat_lfse_04_custom_1861060_page_spreadsheet.xlsx
Unit	Percentage
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Yearly
Temporal coverage	2003-2020
T4_2 file name	38 Education attainment_Eurostat_NUTS2.xlsx
Export options	GEO: 499 regions; Time (25 options); ISCED: 6 classes; Age: 4 options (20-24; 25-34; 25-64; 30-34), Sex: 3 options (total, males, females)
Note	

Variable	38 Population education attainment
Sub-variable	n/a
Task 4.5 code	20
Dataset name	Tertiary Educational Attainment (25-64)
Description	The dashboard shows data on tertiary education attainment (age 15-64) in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	
Unit	%
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	2000-2020
T4_2 file name	
Export options	In section "Education" are 8 options - among them is "Tertiary Educational Attainment (age 25-64)" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

Variable	38 Population education attainment
Sub-variable	n/a
Task 4.5 code	20
Dataset name	Secondary Educational Attainment (25-64)
Description	The dashboard shows data on secondary education attainment (age 15-64) in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	
Unit	%
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	2000-2020
T4_2 file name	
Export options	In section "Education" are 8 options - among them is "Secondary Educational Attainment (age 25-64)" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

Variable	38 Population education attainment
Sub-variable	n/a
Task 4.5 code	20
Dataset name	Early Leavers from Education (18-24)
Description	The dashboard shows data on secondary education attainment (age 15-64) in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	

Unit	%
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	Annual
Temporal coverage	2002-2020
T4_2 file name	
Export options	In section "Education" are 8 options - among them is "Early Leavers from Education (age 18-24)" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

Variable	38 Population education attainment
Sub-variable	n/a
Task 4.5 code	20
Dataset name	Educational attainment and labour-force status
Description	This indicator presents internationally comparable data regarding the labour force status and the educational attainment level by the National Educational Attainment Categories (NEAC) as reported by the labour force survey (LFS) and published in OECD Education at a Glance 2021. For trend data, the Education at a Glance Database includes data from 1981 to 2020 (or years with available data).
Data provider	OECD
URL	https://stats.oecd.org/Index.aspx?DataSetCode=EAG_NEAC
API link	https://data.oecd.org/api/
File name original	
Unit	Percentage
Spatial resolution	NUTS0, EU members of OECD, G20
Spatial coverage	OECD countries (38) + 8 other countries;
Temporal resolution	reference year (according to latest available data)
Temporal coverage	1981 - 2020 (or years with available data)
T4_2 file name	
Export options	Country: 51 options. ISCED 2011 A education level: 19 options. Gender: 3 options (women; men; total). Age: 8 options (age groups). Measure: 2 options (Value; SE). Indicator: 11 options
Note	9 sub-dataset available: Educational attainment of 25-64 year-olds; Trends in educational attainment, by educational attainment and age group; Employment, unemployment and inactivity rate of 25-64 year-olds, by educational attainment; Trends in employment, unemployment and inactivity rates, by educational attainment and age group; Educational attainment of 25-64 year-olds, by programme orientation; Employment, unemployment and inactivity rate of 25-64 year-olds, by programme orientation; Employment, unemployment and inactivity rates, by field of study and age group; Fields of study among tertiary-educated adults, by age group; Educational attainment and duration of unemployment

39 Population residential profile/density

Variable	39 Population residential profile/density
Sub-variable	39a Population density
Task 4.5 code	21
Dataset name	Population density LAU
Description	This datasets provides data on population density at municipality level from national censuses. The population density was computed from age database and LAU GIS layer. The population size was used from Age database (total = population) and the municipality area as provided in LAU GIS layer for 2011.

Data provider	Eurostat – Census data
URL	https://ec.europa.eu/CensusHub2/query.do?step=selectHyperCube&qhc=false
API link	n/a
File name original	n/a
Unit	Persons per square kilometre
Spatial resolution	Municipality (LAU), countries
Spatial coverage	EU27 + some other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	39a_Population density Eurostat LAU.xlsx
Export options	GEO: 123 189 municipalities and regions; Residence or Place of work; Persons, Families and households, Dwellings
Note	

Variable	39 Population residential profile/density
Sub-variable	39a Population density
Task 4.5 code	21
Dataset name	Population density by NUTS 3 region
Description	This dataset contains information on population density by NUTS3 regions.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/demo_r_d3dens/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	demo_r_d3dens
Unit	Persons per square kilometre
Spatial resolution	NUTS3, NUTS2, countries
Spatial coverage	EU27 + some other European countries
Temporal resolution	yearly
Temporal coverage	1990-2019 (not all regions have whole temporal coverage)
T4_2 file name	39b_Population density Eurostat NUTS3.xlsx
Export options	GEO: 2 022 regions; time: 30 years
Note	n/a

Variable	39 Population residential profile/density
Sub-variable	39a Population density3
Task 4.5 code	21
Dataset name	Population density by other region typologies
Description	This dataset contains data on population density for urban, rural, coastal, mountain, island, and border regions
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/URT_D3DENS_custom_1956792/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	URT_D3DENS
Unit	Persons/km2
Spatial resolution	countries
Spatial coverage	EU28 + some other European countries
Temporal resolution	annual
Temporal coverage	1990-2016
T4_2 file name	

Export options	GEO: 5 options; Time: 25 options (1990-2016); Territorial typology: 11 options: Predominantly urban regions, Intermediate regions, Predominantly rural regions, Coastal regions, Non-coastal regions, Mountain regions, Non-mountain regions, Island regions, Non-island regions, Border regions, Non-border regions
Note	n/a

40 Resource use (biomass, construction, iron/steel, fossil fuels), trade of resources

Variable	40 Resource use (biomass, construction, iron/steel, fossil fuels), trade of resources
Sub-variable	40a Biomass
Task 4.5 code	22
Dataset name	EU Biomass flows
Description	The dataset stores data on biomass supply, uses and flows in the EU. The flows of biomass is calculated for each sector of the bioeconomy, from supply to uses including trade.
Data provider	JRC
URL	http://data.europa.eu/89h/34178536-7fd1-4d5e-b0d4-116be8e4b124
API link	
File name original	Dataset_JRC_-_Biomass_uses_and_flows
Unit	1000 T of dry matter
Spatial resolution	NUTS 0
Spatial coverage	EU27
Temporal resolution	Annual
Temporal coverage	2008 - 2017
T4_2 file name	40_ResourceUse_Dataset_JRC_BiomassFlows
Export options	Geopolitical entity: EU countries (NUTS 0). Sector: 4 units (Agriculture, fisheries, forestry, all sectors). Lifecycle steps: Exports, imports, inner uses, losses/unknown, production, uses. Target: 33 units. Year: 10 options (2008 - 2017). Unit: 1000 T of dry matter (Gross trade)/ 1000 T of dry matter (Net trade). Source: 33 units. Level Sankey: 4 options (Total biomass, biomass by sector, biomass by type, biomass components). Flow: 39 units
Note	Biennial update. Dashboard and data in csv format available.

41 Subsidies programs / schemes

Variable	41 Subsidies programs / schemes
Sub-variable	41a Agricultural subsidies
Task 4.5 code	23
Dataset name	Economic accounts for agriculture by NUTS 2 regions
Description	Dataset contains information on agricultural subsidies on products. The subsidies could be selected for individual products, groups of products, plant production, animal production, total agricultural production.
Data provider	EUROSTAT
URL	https://appsso.eurostat.ec.europa.eu/nui/show.do
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	agr_r_accts
Unit	Mil EUR
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries

Temporal resolution	yearly
Temporal coverage	1973-2019
T4_2 file name	41a_Agricultural subsidies_Eurostat_NUTS2.xlsx
Export options	Agricultural indicators: Production value at basic price; Subsidies on products; Taxes on products; Production value at producer price; Products (list of products - EEA): plant products (37 variables); animal products (12 parameters), agricultural outputs (3 variables), other economic variables (39 variables). Unit of measure: Million euro; Million units of national currency
Note	Data are provided only for some countries

42 Population consumption statistics

Variable	42 Population consumption statistics
Sub-variable	
Task 4.5 code	24
Dataset name	Production, trade and apparent use
Description	The dataset contains data on estimate apparent consumption of meat, crops, dairy products, olive oil and wine, at member states level.
Data provider	DG AGRI-JRC
URL	http://data.europa.eu/89h/33243e5e-44a1-4b43-9444-31d64dc7921f
API link	https://agridata.ec.europa.eu/extensions/DataPortal/API_Documentation.html
File name original	Dataset_DG_AGRJ-JRC_-_Production__trade_and_apparent_use__EU-27__
Unit	Tons/hecolitres/ha
Spatial resolution	NUTS 0
Spatial coverage	EU27, EU28
Temporal resolution	Annual
Temporal coverage	2002 - 2021
T4_2 file name	42_PopulationConsumption_Dataset_JRC
Export options	7 Commodities: Crops, Milk, Dairy, Meat, Live animals, Olive oil, Wine Categories: Production/Trade/Apparen use of different agricultural commodities (total of 16 categories) Geopolitical entity: EU 28/EU 27 - on the level of indiuidual countries Time: yearly from 2002.
Note	The dataset is updated 3 times per year, at every new release of the DG AGRI Short-term outlook. Dashboard and data in csv format available.

Variable	42 Population consumption statistics
Sub-variable	
Task 4.5 code	24
Dataset name	Main GDP aggregates per capita
Description	Dataset contains data on individual consumption, consumption expenditure of households, collective consumption
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/nama_10_pc\$DV_648/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	NAMA_10_PC
Unit	Euro per capita, purchasing power standard, percentages
Spatial resolution	country
Spatial coverage	EU28 + other European countries
Temporal resolution	Annual
Temporal coverage	1975-2021

T4_2 file name	
Export options	GEO: 45 units; Time: 47 units; National accounts indicator – 9 types: Gross domestic product at market prices, Final consumption expenditure, Final consumption expenditure of general government, Individual consumption expenditure of general government, Collective consumption expenditure of general government, Household and NPISH final consumption expenditure, Final consumption expenditure of households, Final consumption expenditure of NPISH, Actual individual consumption; Units of measurement – 12 options: percentages of EU27 or EU28, Current prices, euro per capita, Current prices, units of national currency per capita, Current prices, purchasing power standard per capita, Current prices, purchasing power standard (PPS, EU27 from 2020) per capita, Chain linked volumes, Index 2015=100, per capita, Chain linked volumes, Index 2010=100, per capita, Chain linked volumes (2010), euro per capita, Chain linked volumes, percentage change on previous period,
Note	

Variable	42 Population consumption statistics
Sub-variable	
Task 4.5 code	24
Dataset name	Consumption of forest products
Description	Dataset contains data on consumption per head of wood and products derived from wood in countries included in the MCPFE Report 2011
Data provider	European Forest Institute
URL	http://dataservices.efi.int/ltfra/data.php?group=504&land%5B%5D=13674&source=504
API link	
File name original	ltfra.133702
Unit	m3 RWE/1000 inhabitants
Spatial resolution	Countries
Spatial coverage	
Temporal resolution	2010
Temporal coverage	2010
T4_2 file name	30b_ConsumptionofForestProducts_EFI_2010
Export options	Consumptions of forest products: m3 RWE per 1000 inhabitants:2010; Countries included in the MCPFE Report 2011
Note	

44 Farm gate economic return

Variable	44 Farm gate economic return
Sub-variable	n/a
Task 4.5 code	26
Dataset name	Economic accounts for agriculture by NUTS 2 regions
Description	The dataset contains data for economic accounts in agriculture for NUTS2 regions - it offers different selection of agricultural indicators as specified below
Data provider	EUROSTAT
URL	https://appsso.eurostat.ec.europa.eu/nui/show.do
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	agr_r_accts
Unit	Mil EUR
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	yearly

Temporal coverage	1973-2019
T4_2 file name	02_Agricultural income_Eurostat_NUTS2.xls
Export options	Agricultural indicators: Production value at basic price; Subsidies on products; Taxes on products; Production value at producer price. Products (list of products - EEA): plant products (37 variables); animal products (12 variables), agricultural outputs (3 variables), other economic variables (39 variables). Unit of measure: Million euro; Million units of national currency
Note	

45 Livestock (livestock units)

Variable	45 Livestock (livestock units)
Sub-variable	n/a
Task 4.5 code	27
Dataset name	Animal populations by NUTS 2 regions
Description	The dataset contains data on livestock units for different animal species. Only number thousand heads) is available, it is not re-calculated to cattle equivalent.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/AGR_R_ANIMAL_custom_1442853/default/table
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	AGR_R_ANIMAL
Unit	Thousand heads (animals)
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	1978-2020
T4_2 file name	45_Livestock_Eurostat_NUTS2.xlsx
Export options	GEO: 538 regions. Live animals: 47 categories.
Note	n/a

Variable	45 Livestock (livestock units)
Sub-variable	n/a
Task 4.5 code	27
Dataset name	Share of main livestock types in total livestock units (LSU) by NUTS 2 regions
Description	The share of major livestock types (equidae, cattle, sheep, goats, pigs and poultry) in total livestock population expressed in livestock units (LSU); based on Farm Structure Survey data.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/TAI06_custom_1871927/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	AEI_EF_LS
Unit	Percentage of total livestock units
Spatial resolution	NUTS2
Spatial coverage	EU28 + some other European countries
Temporal resolution	2005, 2007, 2010, 2013, 2016
Temporal coverage	2005-2016
T4_2 file name	45_Livestock_types_share_Eurostat_NUTS2.xlsx

Export options	GEO: 372 regions. Live animals: 6 categories - Live horses, asses, mules and hinnies; Live bovine animals, Live swine, domestic species, Live sheep; Live goats, Live poultry. Time: 2005, 2007, 2010, 2013, 2016.
Note	n/a

Variable	45 Livestock (livestock units)
Sub-variable	45a Livestock density index
Task 4.5 code	27
Description	The dataset contains data on livestock density on country level (NUTS0). The livestock density index provides the number of livestock units (LSU) per hectare of utilised agricultural area. The livestock species aggregated in the LSU total, for the purpose of this indicator, are: equidae, cattle, sheep, goats, pigs, poultry and rabbits.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/TAI09_custom_1869746/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
Dataset name	Livestock density index
File name original	TAI09
Unit	index
Spatial resolution	NUTS0 – countries
Spatial coverage	EU28 + some other European countries
Temporal resolution	2005, 2007, 2010, 2013, 2016
Temporal coverage	2005-2016
T4_2 file name	45a_Livestock_density_index_Eurostat_NUTS0.xlsx
Export options	GEO: 40 units (countries, EU27, EU28, Euro area – 19 countries). Live animals: total. Livestock units (LSU) size classes: total. Time: 5 years (2005, 2007, 2010, 2013, 2016)
Note	n/a

46 Irrigation management, timing, intensity

Variable	46 Irrigation management, timing, intensity
Sub-variable	n/a
Task 4.5 code	28
Dataset name	Irrigation: number of farms, areas and equipment by size of irrigated area and NUTS 2 regions
Description	The datasets contains data on irrigation management: number of holdings, area of irrigable land, land irrigated in last 12 months (also by different crops), in last 3 years, at least once a year, method of irrigation, source of water and volume of water used.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/EF_POIRRIG_custom_1437214/default/table
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	EF_POIRRIG
Unit	ha, number, volume (m ³)
Spatial resolution	NUTS 2
Spatial coverage	EU27 + some other European countries
Temporal resolution	2005, 2007, 2010, 2013
Temporal coverage	2005-2013
T4_2 file name	46_Irrigation management Eurostat_NUTS2.xlsx
Export options	GEO: 313 regions; Irrigated area – 10 classes (total ha, 9 categories based on size of irrigated parcels); Eurofarm indicators – 53 indicators, including number of holdings, utilised agricultural area, total irrigable area, ha under glass, irrigation method

	(surface, sprinkler, drop – number of holdings), source of water (on-farm ground water, on-farm surface water, of-farm surface water, off-farm water from water reservoirs, other sources – number of holdings), volume of water used, area irrigated in previous 12 months by different crops – 14 crop groups, irrigated at least once a year, average area irrigated in last 3 years. Time – 4 classes (2005, 2007, 2010, 2013)
Note	n/a

Variable	46 Irrigation management, timing, intensity
Sub-variable	n/a
Task 4.5 code	28
Dataset name	Water abstraction by river basin district
Description	The datasets contains data on water abstraction from 7 types of water sources for 7 types of water processes (including irrigation) according to river basin districts.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/env_watabs_rb/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENV_WATABS_RB
Unit	Milion cubic metres
Spatial resolution	River basin districts
Spatial coverage	EU27 + some other European countries (IC, NO, CH, SB).
Temporal resolution	Annual
Temporal coverage	2000-2019
T4_2 file name	
Export options	River basin districts: 300. Water process: Total gross abstraction; Water abstraction for public water supply; Water abstraction for agriculture – irrigation; Water abstraction for production of electricity – cooling; Water transferred from other regions (imports); Water transferred to other regions (exports); Losses during transport – total. Water sources: Total, Fresh surface and groundwater; Fresh surface water; Fresh groundwater; Non fresh water sources; Desalinated water; Reused water
Note	n/a

47 Fertilizer input (N, P, K fertilisation, liming, pesticides)

Variable	47 Fertilizer input (N, P, K fertilisation, liming, pesticides)
Sub-variable	47a Input of nitrogen
Task 4.5 code	29
Dataset name	Consumption of inorganic fertilizers
Description	The dataset contains data on inorganic fertilizers (nitrogen and phosphorus) consumption per NUTS2 regions.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/AEI_FM_USEFERT/bookmark/table?lang=en&bookmarkId=4d3d0db8-76c1-4884-86e3-bdb23b1dae21
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	AEI_FM_USEFERT
Unit	Tonne
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	2000-2020
T4_2 file name	47a_Input of nitrogen_Eurostat_NUTS2.xlsx
Export options	GEO: 207 regions. Nutrient: nitrogen, phosphorus
Note	n/a

Variable	47 Fertilizer input (N, P, K fertilisation, liming, pesticides)
Sub-variable	47b Input of phosphorus
Task 4.5 code	29
Dataset name	Consumption of inorganic fertilizers
Description	The dataset contains data on inorganic fertilizers (nitrogen and phosphorus) consumption per NUTS2 regions.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/AEI_FM_USEFERT/bookmark/table?lang=en&bookmarkId=4d3d0db8-76c1-4884-86e3-bdb23b1dae21
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	AEI_FM_USEFERT
Unit	Tonne
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	2000-2020
T4_2 file name	47b_Input of phosphorus_Eurostat_NUTS2.xlsx
Export options	GEO: 207 regions. Nutrient: nitrogen, phosphorus
Note	n/a

Variable	47 Fertilizer input (N, P, K fertilisation, liming, pesticides)
Sub-variable	47e Input of pesticides
Task 4.5 code	29
Dataset name	Pesticide use in agriculture
Description	The dataset contains data on the input of pesticides to agricultural land
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/aei_pestuse/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	AEI_PESTUSE
Unit	Kilogram, ha
Spatial resolution	NUTS0
Spatial coverage	EU28, Norway
Temporal resolution	Annual
Temporal coverage	2010-2020
T4_2 file name	n/a – not downloaded
Export options	GEO: 29 units. Pesticide groups: 154 items from 6 main groups: F-Fungicides and bactericides, H - Herbicides, haulm destructors and moss killers, I - Insecticides and acaricides, M – Molluscicides, PGR - Plant growth regulators, ZR - Plant growth regulators. Crops: 177 types.
Note	Data are available only for some countries.

Variable	47 Fertilizer input (N, P, K fertilisation, liming, pesticides)
Sub-variable	47e Input of pesticides
Task 4.5 code	29
Dataset name	Pesticide sales
Description	The dataset contains data on the annual sales of active substances contained in plant protection products placed on the market from reference year 2011 onwards.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/AEI_FM_SALPEST09/bookmark/table?lang=en&bookmarkId=53792fd3-191d-4201-aab5-c01c67fd927c

API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	AEI_FM_SALPEST09
Unit	Kilogram of active substance
Spatial resolution	NUTS0
Spatial coverage	EU28, Iceland, Norway, Switzerland, United Kingdom and Turkey.
Temporal resolution	Annual
Temporal coverage	2011-2020
T4_2 file name	47e_Pesticide sales_Eurostat_NUTS0.xlsx
Export options	GEO: 32 units. Pesticide groups: 156 items from 6 main groups: F-Fungicides and bactericides, H - Herbicides, haulm destructors and moss killers, I - Insecticides and acaricides, M – Molluscicides, PGR - Plant growth regulators, ZR - Plant growth regulators.
Note	Data for 2020 are not available for all countries.

50 Wellbeing information of population

Variable	50 Wellbeing information of population
Sub-variable	n/a
Task 4.5 code	32
Dataset name	Average rating of satisfaction by domain, sex, age and educational attainment level
Description	The dataset contains data on personal wellbeing. The domain "Personal well-being" covers overall life experience, satisfaction with different areas of life, trust in others and in institutions and social support (having someone to rely on in case of need). Results can be structured by age, sex and education.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/ilc_pw01\$DV_527/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ILC_PW01
Unit	Rating (0-10)
Spatial resolution	NUTS0
Spatial coverage	EU28 + some other European countries
Temporal resolution	2013, 2018
Temporal coverage	2013, 2018
T4_2 file name	50_Wellbeing_satisfaction_Eurostat_NUTS2.xlsx
Export options	GEO: 44 regions. Time: 2013, 2018. Personal well-being indicators: 10 indicators - satisfaction with: financial situation, accommodation, job, commuting time, time use, recreational and green areas, living environment, personal relationships, overall life satisfaction, meaning of life. Education: 5 classes. Sex: total, males, females. Age class: 9 classes.
Note	Data from 2018 only for some variables.

53 Number of tourists/visitors to protected areas

Variable	53 Number of tourists/visitors to protected areas
Sub-variable	53b Number of tourists/visitors in region
Task 4.5 code	35
Dataset name	Arrivals at tourist accommodation establishments by NUTS 2 regions
Description	This dataset provides information on numbers of tourists arriving to tourist accommodation establishments by accommodation type and NUTS2 regions. Tourists from reporting country and foreign tourists are distinguished.
Data provider	Eurostat

URL	https://ec.europa.eu/eurostat/databrowser/view/TOUR_OCC_ARN2_custom_1862099/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TOUR_OCC_ARN2
Unit	Number; Percentage change on previous period
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Yearly
Temporal coverage	1990-2020
T4_2 file name	53b_Tourist number_Eurostat_NUTS2.xlsx
Export options	GEO: 534 regions; Country of residence: 3 classes (reporting country, foreign country, total); types of accommodation: 5 types.
Note	This data do not distinguish visitors of protected areas and visitors of other parts of the region. Data for 2020 are provided by Cyprus only.

Variable	53 Number of tourists/visitors to protected areas
Sub-variable	53c Nights spent by tourists/visitors in region
Task 4.5 code	35
Dataset name	Nights spent at tourist accommodation establishments by degree of urbanisation and by NUTS 2 regions (from 2012 onwards)
Description	This dataset provides information on nights spent by tourists at tourist accommodation establishments by degree of urbanisation and accommodation type by NUTS2 regions. Tourists from reporting country and foreign tourists are distinguished.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/TOUR_OCC_NIN2D_custom_1861967/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TOUR_OCC_NIN2D
Unit	Number
Spatial resolution	NUTS2
Spatial coverage	EU27 + some other European countries
Temporal resolution	Yearly
Temporal coverage	2012-2020
T4_2 file name	53c_Tourist nights_Eurostat_NUTS2.xlsx
Export options	GEO: 534 regions; degree of urbanisation: 4 classes (cities; towns and suburbs; rural areas; total); Country of residence: 3 classes (reporting country, foreign country, total); types of accommodation: 5 types.
Note	This data do not distinguish visitors of protected areas and visitors of other parts of the region. Data for 2020 are provided by Cyprus only.

54 Population occupation

Variable	54 Population occupation
Sub-variable	
Task 4.5 code	36
Dataset name	Population by current activity status, occupation and NUTS 2 region
Description	The dataset contains data on occupation, activity and employment status, age class, and sex.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/cens_11ao_r2/default/table?lang=en

API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	CENS_11AO_R2
Unit	number
Spatial resolution	NUTS2
Spatial coverage	EU28 + other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	
Export options	GEO: 478 regions; International Standard Classification of Occupations: Managers, Professionals, Technicians and associate professionals, Clerical support workers, Service and sales workers, Skilled agricultural, forestry and fishery workers, Craft and related trades workers, Plant and machine operators and assemblers, Elementary occupations, Armed forces occupations, Not applicable, Unknown. Age class: 28 options. Sex: 3 options. Activity and employment status: 6 options.
Note	

Variable	54 Population occupation
Sub-variable	
Task 4.5 code	36
Dataset name	Jobs and wealth in the EU bioeconomy
Description	The dataset contains data on bio-based sectors and their contribution to the economy of the EU and its Member States.
Data provider	JRC and the nova-Institute (nova-Institut für politische und ökologische Innovation GmbH)
URL	https://data.jrc.ec.europa.eu/dataset/7d7d5481-2d02-4b36-8e79-697b04fa4278
API link	
File name original	Dataset_JRC_-_bioeconomics
Unit	Number of people
Spatial resolution	NUTS 0
Spatial coverage	EU28 (2008-2019), EU 27 (2020)
Temporal resolution	Annual
Temporal coverage	2008-2019
T4_2 file name	54_PopulationOccupation_Dataset_JRC_Bioeconomics
Export options	Year (2008 - 2019) Country - EU 27 (2020), or EU28, Sector (NACE Rev.2) Indicator (Value added and Turnover)
Note	Dashboard and data in csv format available.

55 Population place of birth

Variable	55 Population place of birth
Sub-variable	n/a
Task 4.5 code	37
Dataset name	Place of birth
Description	The dataset contains information on NUTS3 level on country of birth, distinguished are reporting and foreign country, continents, EU.
Data provider	Eurostat
URL	https://ec.europa.eu/CensusHub2/query.do?step=selectHyperCube&qhc=false
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	
Unit	Number
Spatial resolution	NUTS3
Spatial coverage	EU27 + some other European countries

Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	55_Population country of birth_Eurostat_NUTS3.xlsx
Export options	GEO: 1884 regions. Place of birth – 15 options (reporting country, foreign country, other EU MS, outside EU, but in Europe, continents).
Note	Census data.

Variable	55 Population place of birth
Sub-variable	n/a
Task 4.5 code	37
Dataset name	Population on 1 January by age group, sex and country of birth
Description	The dataset contains information on country level (NUTS0) on country of birth, distinguished are reporting and foreign country, continents, individual countries, EU. The sex is distinguished as well.
Data provider	Eurostat
URL	https://appsso.eurostat.ec.europa.eu/nui/show.do
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	migr_pop3ctb
Unit	Number
Spatial resolution	Countries – NUTS0
Spatial coverage	EU27 + some other European countries
Temporal resolution	annual
Temporal coverage	1998-2020
T4_2 file name	55_Population country of birth_Eurostat_NUTS0.xlsx
Export options	GEO: 39 countries. Age: 27 classes (mostly 5-year classes). Country of birth – 305 options (total, reporting country, foreign country, continents, individual countries, EU). Sex (total, males, females).
Note	Data not available for some countries

56 Living conditions in dwellings

Variable	56 Living conditions in dwellings
Sub-variable	
Task 4.5 code	38
Dataset name	Conventional dwellings by occupancy status, type of building and NUTS 3 region
Description	The dataset contains data on conventional dwellings according 7 types of building.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/cens_11dwob_r3/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENS_11DWOB_R3
Unit	Number
Spatial resolution	NUTS3
Spatial coverage	EU27 + some other European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	
Export options	GEO: 1,857 regions; Housing: Conventional dwellings, Occupied conventional dwellings; Unoccupied conventional dwellings, Unknown. Type of buildings: Total, Residential buildings, One-dwelling residential buildings; Three or more dwelling residential buildings; Non-residential buildings; Unknown
Note	

Variable	56 Living conditions in dwellings
Sub-variable	
Task 4.5 code	38
Dataset name	Total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor - EU-SILC survey
Description	The datasets provides percentage of population living in low-standard dwellings, could be specified according to type of household, level of income, and sex.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/ilc_mdho01\$DV_424/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ILC_MDHO01
Unit	Percentage
Spatial resolution	NUTS0
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	2003-2020
T4_2 file name	
Export options	GEO: 44 (countries and groups of countries). Type of households: 17 types. Sex: Total, Males, Females. Income situation in relation to the risk of poverty threshold: total, Below 60% of median equivalised income, Above 60% of median equivalised income.
Note	

Variable	56 Living conditions in dwellings
Sub-variable	
Task 4.5 code	38
Dataset name	Housing arrangements
Description	The dataset contains information on housing arrangement (types of dwellings) for NUTS2 regions for persons, families and households, and dwellings.
Data provider	Eurostat
URL	https://ec.europa.eu/CensusHub2/query.do?step=selectHyperCube&qhc=false
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	
Unit	Dwellings, families and households, persons.
Spatial resolution	NUTS2
Spatial coverage	EU28+ further European countries
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	
Export options	GEO: 488 NUTS2 regions. Housing arrangement - occupants living in: conventional dwelling, collective living quarter, another housing unit, homeless
Note	

Variable	56 Living conditions in dwellings
Sub-variable	
Task 4.5 code	38
Dataset name	Average number of rooms per person by NUTS region
Description	The dataset contains data on average number of room per person for NUTS2 regions
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/ilc_lvho04n/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ILC_LVHO04N

Unit	average
Spatial resolution	NUTS2
Spatial coverage	EU28 + other European countries
Temporal resolution	annual
Temporal coverage	2007-2020
T4_2 file name	
Export options	GEO: 248 NUTS2 regions.
Note	

Variable	56 Living conditions in dwellings
Sub-variable	
Task 4.5 code	38
Dataset name	Housing size (average size of dwellings)
Description	Average size of dwellings (sq. meters) Calculation: total housing area (sq. meters) total number of households
Data provider	ESPON
URL	https://database.espon.eu/maindata/#/
API link	
File name original	ind_1265_ho_area_data.csv; HO_AREA
Unit	square meters (sq.m)
Spatial resolution	FUA (Functional Urban Areas)
Spatial coverage	CITIES CD; FUA (Functional Urban Areas)
Temporal resolution	2011
Temporal coverage	2011
T4_2 file name	
Export options	No options available.
Note	

59 Resource use (energy carriers, electricity, biomass, construction, iron/steel, fossil fuels)

Variable	59 Resource use
Sub-variable	
Task 4.5 code	41
Dataset name	Material flow accounts
Description	The datasets contains data on wide range of materials including biomass, metal ores, non-metalic minerals, fossil energy materials and their import, export, extraction and consumption.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/env_ac_mfa/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENV_AC_MFA
Unit	Thousand tones, Tonnes per capita, index (2000 = 100)
Spatial resolution	NUTS0 - countries
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	1990-2020
T4_2 file name	
Export options	GEO: 38 units (countries and groups of countries). Materials: 76 types, including biomass, metal ores, non-metalic minerals, fossil energy materials/carriers, waste. Environment indicators - 6 types: Domestic extraction; Imports; Exports; Domestic material consumption; Direct material inputs.
Note	

Variable	59 Resource use
Sub-variable	
Task 4.5 code	41
Dataset name	Circular material use rate
Description	The datasets contains data on circular material use on country level
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/env_ac_cur/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENV_AC_CUR
Unit	Percentage
Spatial resolution	NUTS0 - countries
Spatial coverage	EU28 + totals for EU27 and EU28
Temporal resolution	Annual
Temporal coverage	2004-2020
T4_2 file name	
Export options	GEO: 30 units (countries and groups of countries).
Note	

Variable	59 Resource use
Sub-variable	59a Energy
Task 4.5 code	41
Dataset name	Energy supply and use by NACE Rev. 2 activity
Description	The dataset contains data on energy supply and use according stock or flow and type of economic activity on level of countries
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/env_ac_pefasu/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENV_AC_PEFASU]
Unit	Terajoule
Spatial resolution	NUTS0 - countries
Spatial coverage	EU27 + some other European countries
Temporal resolution	Annual
Temporal coverage	2008-2019
T4_2 file name	
Export options	GEO: 34 units (countries and groups of countries). Statistical classification of economic activities in the European Community (NACE Rev. 2): 87 types. Stock or flow – 5 types: Supply; Use; Transformation use; End use; Emission-relevant use.
Note	

60 Mobility information: accessibility indicators, means of transport

Variable	60 Mobility information: accessibility indicators, means of transport
Sub-variable	n/a
Task 4.5 code	42
Dataset name	Daily accessibility
Description	The dashboard shows data on daily accessibility in the EU member states.
Data provider	JRC
URL	https://urban.jrc.ec.europa.eu/my-place/en?is=Default&ts=EU&dtype=udpp
API link	
File name original	
Unit	NR
Spatial resolution	NUTS1, NUTS 2, NUTS 3
Spatial coverage	EU-27
Temporal resolution	2015, 2020, 2030, 2040, 2050
Temporal coverage	2015-2050
T4_2 file name	
Export options	In section "Transport & Accessibility" are 8 options - among them is "Daily Accessibility" with 3 options (NUTS1, NUTS2, NUTS3)
Note	Datasets are available to download at: https://urban.jrc.ec.europa.eu/downloads/en

62 Physical infrastructure networks

Variable	62 Physical infrastructure networks
Sub-variable	n/a
Task 4.5 code	44
Dataset name	Road, rail and navigable inland waterways networks by NUTS 2 regions
Description	Regional transport statistics. The transport infrastructure data on the length of motorways and other roads, the length of the railway network (by type of railway lines) and the length of the waterways network (by type of waterways).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tran_r_net/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TRAN_R_NET
Unit	km
Spatial resolution	Annual
Spatial coverage	EU27, EFTA countries + some other European countries
Temporal resolution	NUTS2
Temporal coverage	1990-2019
T4_2 file name	64a_Road_railways_waterways_Eurostat_NUTS2.xlsx
Export options	GEO: 474 regions. Transport infrastructure: 7 types: [CNL] Navigable canals, [RIV] Navigable rivers, [MWAY] Motorways, [RD_OTH] Other roads, [RL] Total railway lines, [RL_ELC] Electrified railway lines, [RL_TGE2] Railway lines with double and more tracks.
Note	

63 Buildings and other structures

Variable	63 Buildings and other structures
Sub-variable	n/a
Task 4.5 code	45
Dataset name	Bio-based industry and biorefineries
Description	Database of EU facilities producing different categories of bio-based products (bio-based chemicals - liquid biofuels - bio-based composites and fibres - pulp and paper - biomethane - starch, sugar and derived products - timber (sawmills).
Data provider	JRC
URL	https://data.jrc.ec.europa.eu/dataset/ee438b10-7723-4435-9f5e-806ab63faf37
API link	
File name original	
Unit	Number of facilities
Spatial resolution	NUTS3
Spatial coverage	EU25
Temporal resolution	2020
Temporal coverage	2020
T4_2 file name	n/a
Export options	Products - 7 options: (Chemicals, composites and fibres, liquid biofuels, pulp&paper, starch&sugar, timber, biomethane). Feedstock origin - 7 options: (Agriculture, forestry, grassess and short-rotation coppice, marine, waste, other, info not available) Country - 25 EU countries
Note	Dashboard available

64 Roads, Railways, Settlement areas

Variable	64 Roads, Railways, Settlement areas
Sub-variable	n/a
Task 4.5 code	46
Dataset name	Road, rail and navigable inland waterways networks by NUTS 2 regions
Description	Regional transport statistics. The transport infrastructure data on the length of motorways and other roads, the length of the railway network (by type of railway lines) and the length of the waterways network (by type of waterways).
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/tran_r_net/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	TRAN_R_NET
Unit	km
Spatial resolution	Annual
Spatial coverage	EU27, EFTA countries + some other European countries
Temporal resolution	NUTS2
Temporal coverage	1990-2019
T4_2 file name	64a_Road_railways_waterways_Eurostat_NUTS2.xlsx
Export options	GEO: 474 regions. Transport infrastructure: 7 types: [CNL] Navigable canals, [RIV] Navigable rivers, [MWAY] Motorways, [RD_OTH] Other roads, [RL] Total railway lines, [RL_ELC] Electrified railway lines, [RL_TGE2] Railway lines with double and more tracks.
Note	

Variable	64 Roads, Railways, Settlement areas
Sub-variable	n/a
Task 4.5 code	46
Dataset name	National annual road freight transport by regions of loading (NUTS 3) and by group of goods from 2008 onwards
Description	
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/road_go_na_rl3g/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ROAD_GO_NA_RL3G
Unit	1 000 t
Spatial resolution	NUTS3
Spatial coverage	EU27 + some other European countries
Temporal resolution	Yearly
Temporal coverage	2011-2020
T4_2 file name	
Export options	GEO - 1,812 options; Time - 13 options; Standard goods classification for transport statistics – 22 options: Total transported goods; [GT01] Products of agriculture, hunting, and forestry; fish and other fishing products; [GT02] Coal and lignite; crude petroleum and natural gas; [GT03] Metal ores and other mining and quarrying products; peat; uranium and thorium; [GT04] Food products, beverages and tobacco; [GT05] Textiles and textile products; leather and leather products; [GT06] Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media; [GT07] Coke and refined petroleum products; [GT08] Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel; [GT09] Other non metallic mineral products; [GT10] Basic metals; fabricated metal products, except machinery and equipment; [GT11] Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks; [GT12] Transport equipment; [GT13] Furniture; other manufactured goods n.e.c.; [GT14] Secondary raw materials; municipal wastes and other wastes; [GT15] Mail, parcels; [GT16] Equipment and material utilized in the transport of goods; [GT17] Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.; [GT18] Grouped goods: a mixture of types of goods which are transported together; [GT19] Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16; [GT20] Other goods n.e.c. [UNK] Unknown.
Note	

Variable	64 Roads, Railways, Settlement areas
Sub-variable	64c Settlement area
Task 4.5 code	46
Dataset name	Settlement area
Description	The dataset contains data on size of the settlement area per country (NUTS0). Several units of measure can be chosen.
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/lan_settl/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	LAN_SETTL
Unit	km ² , m ² per capita, percentage and 4 other options.

Spatial resolution	Countries – NUTS0
Spatial coverage	EU28 + some other European countries
Temporal resolution	Annual
Temporal coverage	2009-2018
T4_2 file name	64c_Settlement_area_Eurostat_NUTS0_km2.xlsx; 64c_Settlement_area_Eurostat_NUTS0_per capita.xlsx
Export options	GEO: 32 units (countries, EU, EU27, EU28). Units of measure – 7 types (Square metres per capita; Square kilometre; Index, 2015=100; Index, 2012=100; Index, 2009=100; Coefficient of variation for absolute value; Percentage). Time: 2009, 2012. 2015, 2018.
Note	n/a

68 Birds, bats, frogs, some insects (e.g., grasshoppers) using acoustic recording

Variable	68 Birds, bats, frogs, some insects (e.g., grasshoppers)
Sub-variable	68a Birds
Task 4.5 code	n/a
Dataset name	Status and trends of bird populations: datasets from Article 12, Birds Directive 2009/147/EC reporting
Description	This dataset includes bird population sizes and trends (short and long term) for breeding and wintering populations, as well as pressures and threats for Special Protection Area trigger species.
Data provider	EEA
URL	https://www.eea.europa.eu/data-and-maps/data/article-12-database-birds-directive-2009-147-ec-1
API link	
File name original	Article12_2020_dataset_20210401_csv
Unit	
Spatial resolution	NUTS1
Spatial coverage	27 countries
Temporal resolution	6 years
Temporal coverage	2008-2012 ??
T4_2 file name	68 Birds, bats, frogs, some insects (e.g., grasshoppers) using acoustic recording NUTS1.xlsx
Export options	Article 12 - 2020 dataset or Article 12 - 2015 dataset, csv format or Microsoft Access format and GIS spatial data for both datasets
Note	

Variable	68 Birds, bats, frogs, some insects (e.g., grasshoppers)
Sub-variable	68a Birds
Task 4.5 code	
Dataset name	Common bird indices by type of estimate
Description	The dataset contains indices for three bird groups: all common species, common farmland species and common forest species using bird index on level of countries
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/env_bio2/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENV_BIO3
Unit	Indices
Spatial resolution	EU, EU27, EU28
Spatial coverage	EU28

Temporal resolution	Annual
Temporal coverage	1990-2019
T4_2 file name	
Export options	GEO: 3 options; Time: 30 options; bird species: all common species, common farmland species and common forest species; statistical information – 4 options: Unsmoothed estimate, Smoothed estimate, Smoothed estimate - upper boundary of the 95% confidence interval, Smoothed estimate - lower boundary of the 95% confidence interval.
Note	

Variable	68 Birds, bats, frogs, some insects (e.g., grasshoppers)
Sub-variable	68a Birds
Task 4.5 code	
Dataset name	Common farmland bird index
Description	The dataset contains common farmland bird index on level of countries
Data provider	Eurostat
URL	https://ec.europa.eu/eurostat/databrowser/view/env_bio2/default/table?lang=en
API link	https://ec.europa.eu/eurostat/online-help/public/en/API_06_DataQuery_en/
File name original	ENV_BIO2
Unit	index
Spatial resolution	Country
Spatial coverage	26 EU countries
Temporal resolution	annual
Temporal coverage	1990-2020
T4_2 file name	
Export options	GEO: 26 options; Time: 31 options
Note	Index compares situation with year 2000 (2000 = 100%)

81 Macrophyte community (quantitative)

Variable	81 Macrophyte community
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Waterbase - Biology
Description	Dataset contains biological data in rivers, lakes, transitional and coastal waters, which is reported as ecological quality ratios (EQRs).
Data provider	European Environmental Agency
URL	https://www.eea.europa.eu/data-and-maps/data/waterbase-biology
API link	
File name original	
Unit	different units
Spatial resolution	
Spatial coverage	26 countries
Temporal resolution	dynamic
Temporal coverage	1990-2018
T4_2 file name	81 Macrophyte community quantitative NUTS1.xlsx
Export options	download in csv format
Note	

89 Aboveground biomass

Variable	89 Aboveground biomass
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Forest Growing Stock
Description	Dataset contains data on Growing Stock (volume) on Forest on million cubic metres in countries included in the MCPFE Report 2011
Data provider	European Forest Institute
URL	http://dataservices.efi.int/ltfra/data.php?group=504&land%5B%5D=13037&source=504
API link	
File name original	ltfra.131814
Unit	mil. m3
Spatial resolution	Countries
Spatial coverage	
Temporal resolution	2010
Temporal coverage	2010
T4_2 file name	30a_ForestryUse-GrowingStock_EFI_2010
Export options	Growing Stock on Forest; Countries included in the MCPFE Report 2011
Note	

136 Bulk NH4-N, NO3-N, Ntot, P, K deposition in precipitation

Variable	136 Bulk NH4-N, NO3-N, Ntot, P, K deposition in precipitation
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Air Quality e-Reporting (AQ e-Reporting)/Air Quality Measurements (data flow D)
Description	Database consists of a multi-annual time series of air quality measurement data and calculated statistics for a number of air pollutants. It also contains meta-information on the monitoring networks involved, their stations and measurements, air quality modelling techniques, as well as air quality zones, assessment regimes, compliance attainments and air quality plans and programmes reported by the EU Member States and European Economic Area countries. Air pollutants: NH4, NH4, NH4 in PM10, NH4 in PM2.5, NO3, NO3-, NO3- in PM10, NO3- in PM2.5, N-DEP, K, K in PM10, K in PM2.5
Data provider	EEA
URL	https://discomap.eea.europa.eu/App/AirQualityMeasurements/index.html#
API link	
File name original	
Unit	ug.m-3
Spatial resolution	
Spatial coverage	all EU Member States, as well as EEA cooperating and other reporting countries, 41 countries
Temporal resolution	dynamic
Temporal coverage	2017 - 2021
T4_2 file name	136 Bulk NH4-N, NO3-N, Ntot, P, K deposition in precipitation NUTS1.xlsx
Export options	download in csv format, filters: Country, Year, Timezone, Air Quality Network, Sampling Point Id, Sampling Point Status, Air Pollutant, Longitude, Altitude, Air Quality Station Area, Air Quality Station Type, Operational Activity Begin, Operational Activity End, Sample Id, Process Id, Process Activity Begin, Process Activity End, Measurement

	Type, Measurement Method, Measurement Equipment, Sampling Method, Analytical Technique, Equivalence Demonstrated
Note	https://www.eea.europa.eu/data-and-maps/data/aqereporting-9

137 Bulk pH, anion, cation deposition in precipitation

Variable	137 Bulk pH, anion, cation deposition in precipitation
Sub-variable	n/a
Task 4.5 code	n/a
Dataset name	Air Quality e-Reporting (AQ e-Reporting)/Air Quality Measurements (data flow D)
Description	Database consists of a multi-annual time series of air quality measurement data and calculated statistics for a number of air pollutants. It also contains meta-information on the monitoring networks involved, their stations and measurements, air quality modelling techniques, as well as air quality zones, assessment regimes, compliance attainments and air quality plans and programmes reported by the EU Member States and European Economic Area countries. Anions and cations:
Data provider	EEA
URL	https://discomap.eea.europa.eu/App/AirQualityMeasurements/index.html#
API link	
File name original	
Unit	diferent units mg.l-1, ug.m-3
Spatial resolution	
Spatial coverage	all EU Member States, as well as EEA cooperating and other reporting countries, 41 countries
Temporal resolution	
Temporal coverage	2017 - 2021
T4_2 file name	137 Bulk pH, anion, cation deposition in precipitation NUTS1.xlsx
Export options	download in csv format, filters: Country, Year, Timezone, Air Quality Network, Sampling Point Id, Sampling Point Status, Air Pollutant, Longitude, Altitude, Air Quality Station Area, Air Quality Station Type, Operational Activity Begin, Operational Activity End, Sample Id, Process Id, Process Activity Begin, Process Activity End, Measurement Type, Measurement Method, Measurement Equipment, Sampling Method, Analytical Technique, Equivalence Demonstrated
Note	https://www.eea.europa.eu/data-and-maps/data/aqereporting-9

Annex 4: Summary of feedback from the eLTER cookie-cutting DataLabs demonstration on 17th and 18th September 2020

Contents

Summary	112
Introduction	112
Attendees	115
Feedback	115
Access to data lab and cookie-cutting tool	115
Geographic units supported	115
Geographic boundary identifiers used to cookie-cut	116
Calculation of boundary cutting	116
Preliminary plot of data	117
Downloading data	117
Training and documentation	118
Automation of cookie-cutting workflows	118
Management issues	118
Feedback forms	119
17 th September 2020	119
18 th September 2020	122

Summary

The prototype eLTER cookie-cutting tool was demonstrated to 19 members of the eLTER community and their feedback collected in a structured manner. This report contains copies of the feedback provided and a summary of the actions to be taken. The tool was well-received and a number of immediate action points were noted. Opinions on the further development of the tool were provided and further consultation will be held to refine the required needed by the eLTER RI.

Introduction

As part of eLTER PLUS WP3, WP4, WP10 and WP11, it was agreed at the virtual kick-off April 2020 to create a datalab to 'cookie-cut' data to the boundary of the LTSER platforms and potentially LTER sites. Official census data was one data type recognised as important for socio-ecological research (WP4.2) but also gridded or raster data sets (WP4.3 and WP4.4). This work also feeds from WP10 and WP11 and aims to contribute to deliverable D4.5: Data service portal concept and piloting of tailored socio-economic and environmental data for selected eLTSER Platforms (Delivery Month 40).

The demonstration commenced with an overview presentation. The initial slide highlighted that to date the testing had been with WP4.2, WP4.5 and the code was created in WP11. WP3 and WP10 contributed potential essential variables to be included in the testing phase and WP8 the platform for testing (Fig 1).

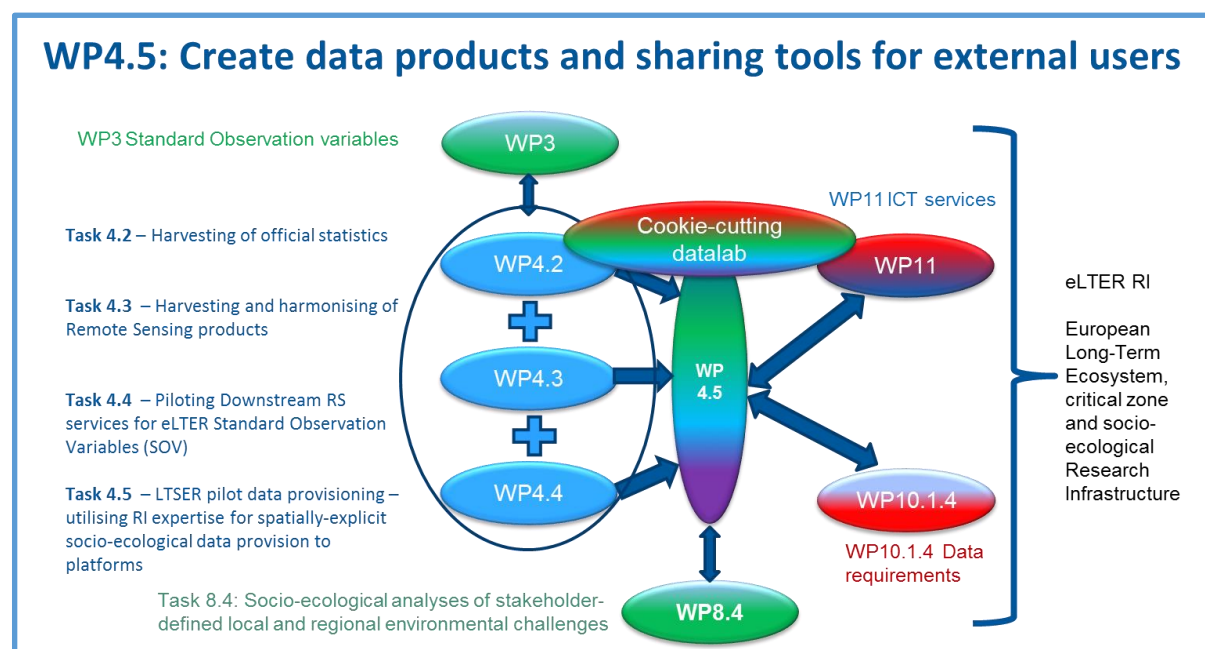


Figure 1 Overview of eLTER PLUS work package structure involved to date.

The problem that the cookie-cutting tool addressed was outlined. Essentially data was often not provided for the correct spatial area of LTSER platforms or LTER sites (Fig 2).

It was recognised that to enable cross-platform comparisons and synthesis across platforms data was available that was already harmonised (e.g., Eurostat). However, as LTSER platform research must also serve national stakeholders the need to deliver data using national data repositories was recognised as also important.

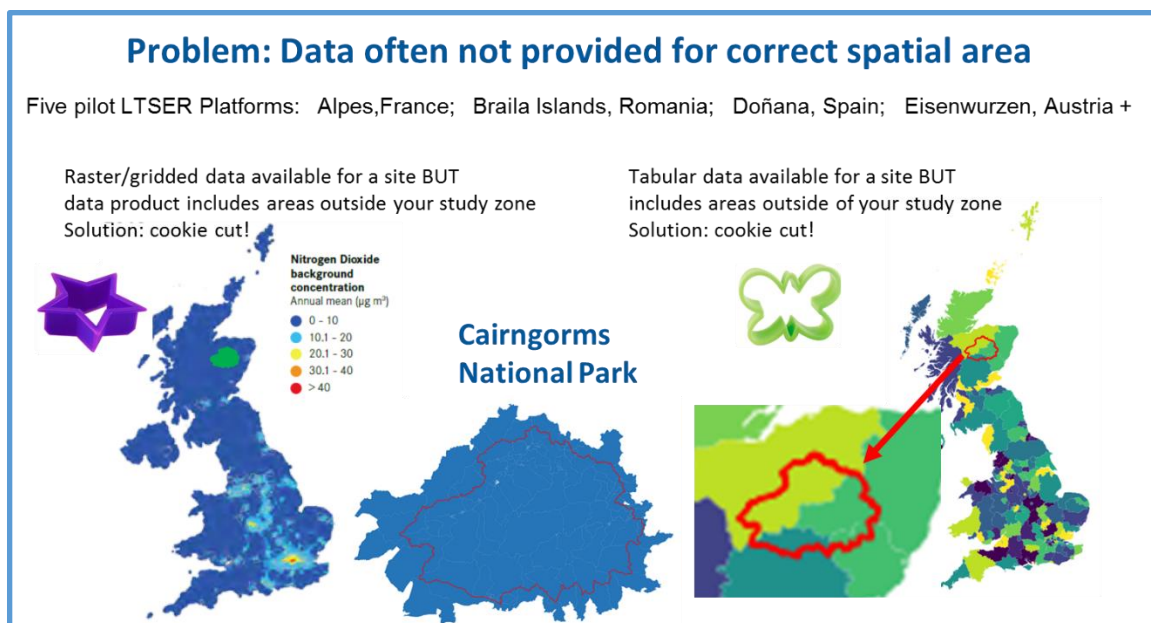


Figure 2. Explanatory diagram highlighting the problem that the cookie-cutting DataLabs was initiated to solve illustrated schematically using the Cairngorms LTSER platform.

Within eLTER PLUS the initial application of the cookie-cutting tool focused on the five pilot LTSER platforms (Table 1).

Table 1. Name, DEIMS database link and eLTER PLUS contact points for five test LTSER Platforms

LTSER Platform name	DEIMS.ID	eLTER PLUS Contact points
LTSER Zone Atelier Alpes – France	https://deims.org/79d6c1df-570f-455f-a929-6cfe5c4ca1e9	Vincent Bretagnolle Vincent.BRETAGNOLLE@cebc.cnrs.fr ; Sabrina Gaba sabrina.gaba@inrae.fr
Braila Islands - Romania	https://deims.org/d4854af8-9d9f-42a2-af96-f1ed9cb25712	Mihai Cristian Adamescu mihaicristian.adamescu@g.unibuc.ro
Cairngorms National Park LTSEr - United Kingdom	https://deims.org/1b94503d-285c-4028-a3db-bc78e31dea07	Jan Dick jand@ceh.ac.uk
Doñana Long-Term Socio-ecological Research Platform – Spain	https://deims.org/bcbc866c-3f4f-47a8-bbbc-0a93df6de7b2	Ricardo Díaz-Delgado rdiaz@ebd.csic.es ; Pablo F. Méndez pfmendez@gmail.com
LTSEr Platform Eisenwurzen (EW) – Austria	https://deims.org/d0a8da18-0881-4ebe-bccf-bc4cb4e25701	Veronika Gaube veronika.gaube@boku.ac.at ; Andrea Stocker-Kiss Andrea.Stocker-Kiss@umweltbundesamt.at

The prototype was created between April and September 2020 and show cased to WP3, WP4, WP8, WP10 and WP11 representatives on 17th and 18th Sept 2020 (Figure 3). Feedback was invited via a google doc (Fig 4), via chat facility in the Zoom and verbally during the discussion. Here we report the feedback. Many important points were raised which will require extensive discussion with representatives from other WPs and many cannot be answered until the cookie-cutting tool is used in earnest in WP8.

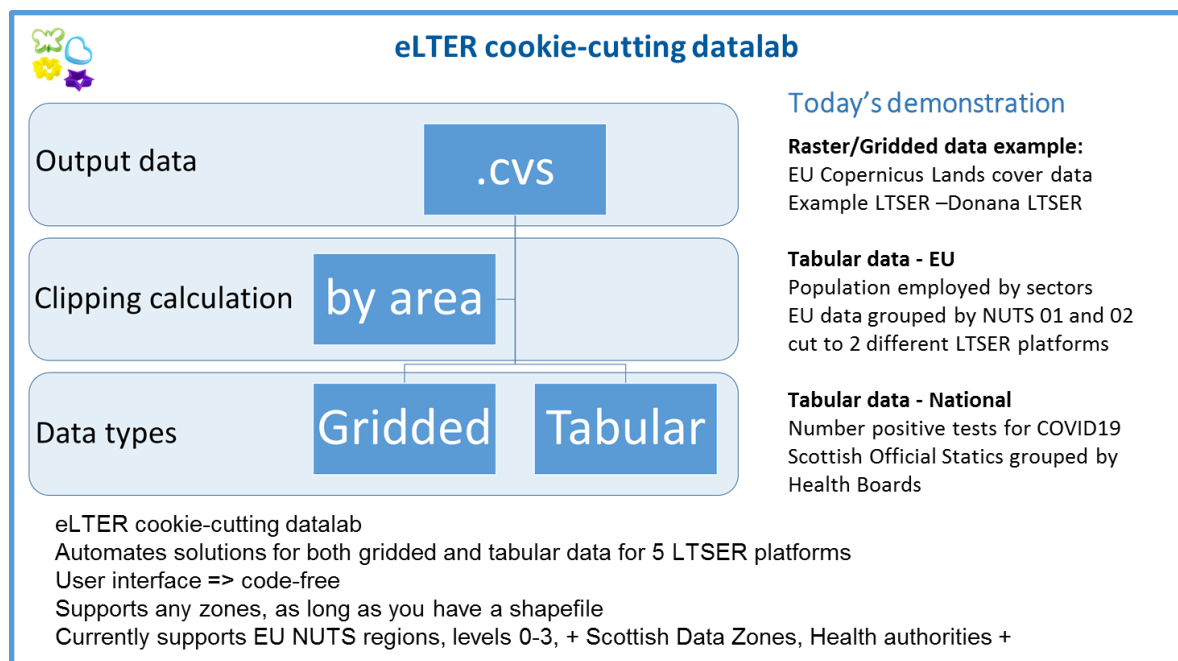


Figure 3. Overview of the cookie-cutting DataLabs and details of the demonstration

Feedback on today's demonstration

Consultation the prototype eLTER cookie-cutting App

This document is designed to collect feedback on the current state and future work related to the eLTER Cookie-cutting app developed by WP11 in conjunction with WP4.2 and WP4.5

Tables for feedback follow the chronological sequence of the demonstration conducted via Zoom on Thursday 17th Sept at 8:00-9:00 UK time and again on Friday 18th Sept at 09:00-10:00.

Aim of meeting

- Show progress to date on the prototype cookie-cutting app developed by WP11 in conjunction with WP4.
- Canvass opinions on features feasible to deliver as an App to all eLTER membership and features that the user must self-program
- Agree strategy to beta-test across eLTER PLUS members (target WP8 and WP9).

Structure

The functionality of the prototype App will be demonstrated and feedback sought via this google document following the structure of the demonstration. Each section has a Table with approximately the correct number of lines – please select a number and use that cell in each of the following tables (this will avoid others overwriting your text ☺)

1. Access to data lab

No.	Comment / Question/ Observation/ Reflection
1	
2	
3	
4	
5	
6	
7	
8	

https://drive.google.com/drive/u/0/folders/1oYNreqTK5xnBCbUXNZ0MI7r6WLyBF_8X






Figure 4. Feedback form completed by participants at the cookie-cutting DataLabs demonstration.

Attendees

In total 19 participants attended across the two days. The number of participants reflects the collaborative nature of this task and the need to consult widely to ensure maximum utility for the maximum number of people. Representatives from the management team, WP4, 8, 9, 10 and 11 were present.

Feedback

The feedback form followed the steps required to access the DataLabs, select datasets and boundaries to cookie-cut and downloading the resultant data and plots. Feedback sheets from both days are provided (Appendix 1) and summary of the issues, response and actions arising are provided below. These have been grouped considering the utility of the current version and future improvements

Access to data lab and cookie-cutting tool

Several people asked about the access protocol to the cookie-cutting DataLabs. Currently, access is restricted to eLTER members. It is currently a two-step process with the user registering for a DataLabs account and then emailing Will Bolton, (WilBol@ceh.ac.uk) who grants access.

The aim is to make this facility a service in the eLTER RI and consequently a governance structure needs to be developed within the overall governance of the eLTER RI. Two extreme options were discussed as well as various midway options:

1. Cookie-cutting DataLabs open - freely available to anyone who registers for access to the DataLabs with ability to upload and download data plus the ability to download and alter the DataLabs code.
2. Restricted to eLTER RI members, continuing to need a registration process as currently with full access to the DataLabs allowing upload and download of data and access to the DataLabs code.

A decision on access will be taken later in the eLTER PLUS project but all eLTER PLUS members are welcome to register to use the current tool.

Geographic units supported

Currently only the shape files for the five pilot LTSE platforms have been uploaded into the tool. The cookie-cutting tool technical support team can upload any number of shape files. It was also suggested that the tool should be able to link through to the DEIMS database and request the shape file dynamically each time requested. Therefore if boundary changes, the user would always be given the most updated boundary - it must be remembered that boundaries can and do change with time and this brings further issues of transparency and differences with legacy data, version control etc. In addition, linking to the DEIMS database was considered useful, as it would encourage all site and platform owners to upload the shape files for their site. These suggestions have operational significance and therefore decisions with other WPs are necessary before action is taken.

A facility to enable a user to upload any shape file (e.g. a smaller area within a LTSE platform), is also possible. Technically this may be a similar approach to the current method to upload the dataset that requires cookie-cutting. However, before this suggestion is implemented it is necessary to think through:

1. Will the boundary be saved and therefore available to other users?
2. Will there need to be quality control of the shape file to ensure that it correctly includes all the area named?

It was also suggested that an automatic buffer zone of a user-defined dimension would be useful e.g. 10 km around the edge of the shapefile boundary. During the eLTER PLUS project the research conducted in WP8 and WP9 will determine the need for this feature and the best implementation strategy.

Geographic boundary identifiers used to cookie-cut

Gridded/Raster data

Currently the tool looks at the spatial location of the shapefile and identifies which of the raster cells in the input data fall within the shapefile or are tangented by its border. If completely covered by the shapefile or if even slightly tangent, these raster cells are exported to the output raster without manipulating it.

Tabular data

Currently it is possible to cookie-cut with data files that include identifiers for administrative units on national and regional scale: NUTS0, NUTS1, NUTS2, and NUTS3 regions. For local scale, there is the possibility to also use the Eurostat system of LAU (Local Administrative Units). National statistics are commonly delivered at other scales. For example, Scottish National Statistics data is held at different spatial scales and therefore need different algorithms to create answers for mapping units that are only partly within the LTSEr platform (see Appendix 2). NUTS, LAU and national geographic units' boundaries are not static in time i.e., there are differences in their boundaries between individual years. Therefore, it is important to link tabular data with the proper GIS layer for the respective year.

In consultation with the managers of the five pilot LTSEr platforms, the range of national geographic units will be determined for France, Romania, Spain and Austria (i.e., similar table to Appendix 2 for each) and then decisions taken in collaboration with other eLTER members as to the most cost-effective method to provide the maximum service to eLTER RI users.

Calculation of boundary cutting

Currently the area of a geographic unit is used as a proportion to calculate the value output in the dataset. For example, if 10% of the area falls within the platform boundary, then the assumption is that 10% of the data (e.g. population) falls within the platform boundaries.

It is possible to consider using other approaches for 'non-spatial even' data. During the eLTER PLUS project the research conducted in WP8 and WP9 will highlight what other units may be sensible to include in the tool.

Uploading data

Initially the input data to the cookie-cutting tool was a file in the format of Comma Separated Values (CSV) file. CSV files are a plain text file that contains a list of data. These files are often used for exchanging data between different applications. The idea is that you can export complex data from one application to a CSV file, and then import the data in that CSV file into another application. However, sometimes the data are quite complex and it is practical to store them in different sheets of an Excel file. Therefore, the tool has been updated to accommodate both file types. No other input file format was suggested.

It was suggested that the user should be provided with a preview of the data as a popup or second window. This will become even more important if a catalogue of stored data becomes available. The options for delivering this request are being considered.

Apart from the first column (which must contain the geographic identifier) there is no restrictions on the type of data held in the following columns.

Preliminary plot of data

Currently a preliminary plot of the data is returned to the user with a limited ability to change the title and no ability to change colours or the underlying map (e.g., overlay on a landcover map). The purpose of the preliminary plots is limited and defined as:

1. To quickly see if the data is reasonable
2. To quickly view, the data held within the input data file e.g. temporal change if separate columns for different years are included in the input data file.
3. To produce a working plot for discussion with colleagues (rather than publishable quality).

It was suggested that adding the ability to customise the plots within the tool would be adventitious and the cookie-cutting tool technical support team are capable of doing this. However, at least for the initial testing phase in eLTER PLUS project it was decided that the preliminary plot was sufficient and that the user should download the data and transfer to a specific graphic or geographic package if more than a preliminary plot is required.

The ability to download the plots as TIF files with implicit projection coordinates was requested – it was agreed to investigate this option.

It was suggested that even the preliminary plots should include a geographic scale to enable easy comparison between the five LTSEr pilot platforms (and later for many other areas defined by uploaded shapefiles). This was considered a simple addition in the current version as it would require to be stored only once with the shapefile and would therefore be implemented. However, the implications of this for user defined shapefiles needs to be considered carefully.

It was suggested that the default image in the plot preview panel should be the eLTER logo rather than the outline of an LTSEr platform. This a helpful suggestion and will be implemented

Downloading data

Currently the output data is provided in only one format - Comma Separated Values (CSV) file. Other suggestions included JPEG2000, COG, ASCII, HDF. These will be considered in future versions of the tool.

A participant asked if it was possible to normalise data outputs to a consistent format/scale for consistent comparisons. This is possible but may involve loss of precision as all would need to be normalised to the lower-resolution. Preliminary tests within eLTER PLUS will determine what exactly and how often this requirement is requested by the community.

It was suggested that calculations with the data could be performed prior to downloading the data e.g. total a range of columns or calculate the change between two columns. At this time, the range of possibilities is large so a decision will be taken later following the testing in WP8 and WP9 and no manipulation of the data will be coded at this time.

If calculations are performed and the data stored the possibility of creating a new dataset, which may be registered for a Digital Object Identifier (DOI), was briefly discussed. This possibility depends on many factors and is consequently just noted here.

One participant highlighted the need at the start of defining the workflow, to consider the spatial resolution and extents of the output if it is stored. Currently this tool simply outputs the spatial resolution that was input. However, if the data is stored and if comparisons are encouraged a common spatial resolution may be agreed and data output and stored at both resolutions (input resolution and 'standard'). The tests conducted in WP8 and WP9 of the eLTER PLUS will be monitored and a decision on this issue taken later.

Training and documentation

Documentation and click-by-click video tutorial for the cookie-cutting tool will be created prior to release and these two workshops were in part designed to ensure the type of questions users might ask were answered. It was suggested that the following information should be included as an 'info icon'. The tool does not currently have this feature and rather than complicate the screen the text will be added above the input section.

Storing data

Currently the tool does not store data created during cookie-cutting process because while desirable implementation requires consideration of many factors and during this piloting phase the data will be downloaded for immediate use while the longer-term strategy is agreed. Factors to consider include,

- provision of metadata of stored output data available to user
- provision of catalogue of datasets and shapefiles available
- provision of a search function
- provision of agreed terminology
- provision of quality control

Automation of cookie-cutting workflows

There was a request to enable automation of cookie-cutting workflows – this is possible and will be considered in due course

Management issues

It is recognised that we are at the start of the road but our vision is to feed into the eLTER RI INFORMATION CLUSTERS. Therefore, how the output is systematically transferred and included in the whole set of "information clusters" (i.e. all eLTER sites) and how this can be done in a structured way needs to be addressed. There is a need to distinguish between what's provided for ALL sites (as a central service itself) and what is provided upon request by central staff and what is simply done by satellite users that are supported by a smart tool itself. This issue is a work in progress and involves many eLTER members.

Feedback forms

17th September 2020

Consultation the prototype eLTER cookie-cutting App

This document is designed to collect feedback on the current state and future work related to the eLTER Cookie-cutting app developed by WP11 in conjunction with WP4.2 and WP4.5

Tables for feedback follow the chronological sequence of the demonstration conducted via Zoom on Thursday 17th Sept at 8:00-9:00 UK time and again on Friday 18th Sept at 09:00-10:00.

Aim of meeting

- Show progress to date on the prototype cookie-cutting app developed by WP11 in conjunction with WP4,
- Canvass opinions on features feasible to deliver as an App to all eLTER membership and features that the user must self-program
- Agree strategy to beta-test across eLTER PLUS members (target WP8 and WP9).

Structure

The functionality of the prototype App will be demonstrated and feedback sought via this google document following the structure of the demonstration. Each section has a Table with approximately the correct number of lines – please select a number and use that cell in each of the following tables (this will avoid others overwriting your text 😊)

1. Access to data lab

No.	Comment / Question/ Observation/ Reflection
1	Is the idea to allow anyone to store data here (independently uploaded) or should data go through CEH data managers? How to assure quality control of data?
2	Is it open access - so anyone can login and take data? Or is it by invitation/request?

2. Access to cookie-cutting data lab

No.	Comment / Question/ Observation/ Reflection
1	how is the workflow intended to sign up for the different projects or notebooks? this should be clear (as part of the WP11)
2	Frankly, I see the app as one of the services eLTER aims for (pppWP5) and that certainly fulfils specific needs of users. In this context access is appropriate, although you may want to think about moving it to an open space without any registration/login need (would also reduce effort on your end) For the general clipping functionality (=cookie-cutting however), I would suggest to connect your efforts with pppWP4 so that they can use your py-scripts in the workflow they develop (that does not have any clipping functionality included as far as I know)
3	Sites is not an obvious place to go - can that be changed?

3. Steps to cookie cut data

3.1. Select Data type (gridded/non-gridded)

No.	Comment / Question/ Observation/ Reflection
-----	---

1	Make sure there is a unified lexicon for all of the technical terms (e.g., tabular versus raster data - they should be referred to in the same way across the platform).
2	use cases for vector data? would that make sense in the context of the cookie cutting

3.2. Select data and active column (upload data file and select column in multi-column datasets)

No.	Comment / Question/ Observation/ Reflection
1	if the actual sources could be seen in a view panel in parallel it would be easier (currently one
2	is there a predefined format that data needs to be provided? e.g. column names in the first line?
3	Insert an info that i) data of any projection can be uploaded, ii) processing time is depending on the size of the input file, iii) the user can observe the upload status below

3.3. Select data geographic unit to cookie-cut (geographic unit of data and geographic boundary to be included).

No.	Comment / Question/ Observation/ Reflection
1	may be this needs a bit more metadata in the picklist (what does the element actually represent, what is the origin....). May be in a pop-up menu or button "show metadata of selected items" (example: people might not know about DEIMS, - and also, if the shape file is read from a copy of DEIMS data or accesses DEIMS-SDR on-line (this relates to the time stamp too))
2	site selection should dynamically linked to the DEIMS API as the site information might be updated / question of versioning of site information (needs to be discussed with Christoph)
3	We should use this app to encourage all platforms/sites to upload their boundary polygon (not sure how complete our data is/how many sites/platforms have uploaded their boundaries).
4	I would not call it "Deims site" but something like "Long-term monitoring sites"
5	need to have a better opening image in the preview

4. Download data and plot

No.	Comment / Question/ Observation/ Reflection
1	We have to have a dialogue between WP 4 and WP 8/9 (tasks 8.4/9.4) regarding what remotely sensed data would be useful for addressing SE questions, and then assess whether they are available and get them working on raster data prep for handoff to WP 8/9
2	CONCERNING OUTPUT in general: in the bigger picture eLTER aims at creating "INFORMATION CLUSTERS: this is even the name of the WP4. So, a key systemic question is how the output is systematically transferred and included in the whole set of "information clusters" (i.e. all eLTER sites) and how this can be done in a structured way, - distinguishing between what's by plan provided for ALL sites (as a central service itself) and what is provided upon request by central staff and what is simply done by satellite users that are supported by a smart tool itself: WE NEED A PLAN HERE AND FROM MY POINT OF VIEW THIS IS AN INTRINSIC TASK OF THE WP4 leadership.
3	@Will, can you please check, my output is not named according to the field "What is this dataset called?" It is shown in the example window but the output is always called cropped-data.tif
4	do you intend to have different output formats (JPEG2000, COG, ASCII,HDF)?
5	JP mentioned the batch processing option, that I would also favour
6	
7	question about the DOIs for created datasets... and their storage

8	is it possible to modify the visual image of the plot, e.g. change colours, rasters, lines etc, or is that something to do in another program?
9	@Will, what projection do you work with? (from the chat)
10	@Will during the clipping (cookie-cut), is there any resampling being done on the raster file that may change the raster value?
11	what is the character limited

5. Discuss features feasible to deliver as an App to all eLTER membership and features that the user must self-program into the data lab

5.1 Calculation of boundary cutting (a) choosing the standardising/normalising unit (e.g. area, population) (b) choosing threshold of unit to be include (c) ... other

No.	Comment / Question/ Observation/ Reflection
1	Eventually we should have a protocol (or at least advisory notes) regarding how to consider tabular data for which the entire geographic unit does not fall within the boundaries of the site/platform. E.G. If 10% of the area falls within the platform boundaries, then the global assumption is that 10% of the data falls within the platform boundaries (or the alternative, every platform makes its own consideration).
2	we had the discussion to include a buffer zone around the boundaries to also analyse the effect from the mostly managed areas and compare it to the unmanaged surroundings. This could be one further option to choose from.

6. Strategy to beta-test across eLTER PLUS members

No.	Comment / Question/ Observation/ Reflection
1	would be good to run a workshop during the eLTER Oct meeting / good way to get feedback from project users (such WS will be "full" when we give the presentation a stage in the plenary)
2	Recall that the plan was to use this data directly in the SE tasks 8.4 and 8.5 (which is why the current platforms correspond to the focal platforms in 8.4 and 8.5). So... the SE team is ready!
3	Please include WP4 here, there remote sensing view is different and may bring in very different facets, thus I strongly encourage you to have pppWP4 as beta testers
4	We can also "Beta Test" using the COVID-19 Resilience project; here, too, we have to look at the resilience variables and assess which are readily accessible.

7. Please use this space to make any other remark to the team

No.	Comment / Question/ Observation/ Reflection
1	Recall the desire to use this tool and the data it provides as an incentive to encourage participation of sites and platforms (they get access to European scale data for research). The need for such incentives was one of the major conclusions of the previous eLTER project (WP10), in order to encourage better RI-scale participation. This, of course, emphasizes the main role of the data and tool - to provide European scale data along a gradient for research purposes.
2	it is a bit off-topic but relates to the long-term storage issue after clipping. What we eventually will run into is a lot of data with different spatial resolutions (some call it granularity but I specifically refer to the cell size for rasters or area of tabular and vector data). Yet, in order to perform any spatial analyses on whatever topic it will be required to have a common spatial scale/basis (like a data cube!). In its current theoretical form, this would not be possible. I see two possible solutions and one of it concerns your app directly. 1. During the cookie-cutting, the resampling step could be used to force any resampled data to have the same

	spatial resolution and extents. 2. An even better solution could be to define an “eLTER Grid”. Let’s say it is a regular grid of 10x10m for each of the eLTER sites. Any data that is clipped is afterwards related to the eLTER Grid by filling the eLTER Grid cells with the data of the clipped data sets. Each data set would then be represented as an individual layer, so that no information is lost. That way we create the common spatial basis, are independent from any data source (even tabular or vector data could be integrated) and prepare the ground for data cubes that could easily be used in the future for any AI business.
--	--

18th September 2020

Consultation the prototype eLTER cookie-cutting App

1. Access to data lab

No.	Comment / Question/ Observation/ Reflection
1	why is the Cairngorms always in the picture - can it be changed to say eLTER logo?

2. Access to cookie-cutting data lab (no feedback but see zoom chat below)

3.1. Select Data type (gridded/non-gridded) (no feedback but see zoom chat below)

3.2. Select data and active column (upload data file and select column in multi-column datasets)

No.	Comment / Question/ Observation/ Reflection
1	Maybe for representation it will be great to have aggregated data for tabular datasets such as in the example a column with total number of infected people per zone or the temporal trend. This can obviously be included by the user uploading the dataset in 2 new columns but as total summatory of all columns or trend may be implemented automatically
2	I did not properly understand whether the column on area ratio is mandatory or not, and if so how we calculated (I have a guess)
3	Tool for temporal aggregation could be useful
4	For data available directly in the repository we will need to provide metadata where users will find explanations of acronyms and codes used in the dataset and other information. The document with metadata should be accessible when the user is selecting dataset
5	Now there is a limited number of datasets available in the tool. This will be increased and we need to think about tool for identification/finding/selection of data. Possibly there will be needed hierarchical approach - e.g. thematically (on first level e.g. ecological/socioeconomic data and so on) - we need to think about and design it. The same will be needed for spatial data.

3.3. Select data geographic unit to cookie-cut (geographic unit of data and geographic boundary to be included).

No.	Comment / Question/ Observation/ Reflection
1	I am not sure if there is possible to use own spatial units (own shapefile) in part “Choose filter type”. If not, it will be useful to include such functionality - similar approach as in part “Upload your data here”.

2	can anyone upload their own shape file for another area? how do we update the datazones Can you only determine the ratio by area what if I wanted to determine the proportion of people in the area? Is the shape taken dynamically or are they static. What happens if the boundary change.
---	---

4. Download data and plot

No.	Comment / Question/ Observation/ Reflection
1	Maybe plots might be downloaded as TIF file with implicit projection coordinates
2	Again, maybe plots might include scale if they are going to be used for publications
3	I realized that cropping from gridded data or raster did not provide a plot with legend. I think even 2 categories such as background and grasslands should appear in the legend
4	is there a format for the date input

5. Discuss features feasible to deliver as an App to all eLTER membership and features that the user must self-program into the data lab

5.1 Calculation of boundary cutting (a) choosing the standardising/normalising unit (e.g. area, population) (b) choosing threshold of unit to be include (c) ... other....(no feedback but see zoom chat below)

6. Strategy to beta-test across eLTER PLUS members

No.	Comment / Question/ Observation/ Reflection
1	Not sure where to make this comment - About proprietary issues with data and geodata the approach might be mixed. Platform owners can create geodata and/or perform data transformations (e.g., from national statistics) than then they can decide to centralize and, through the metadata and services, offer the possibility to get in contact for offering further developments or transformations depending on needs. Normally, people is happy to share their data and shapefiles, provided that there is reciprocity from others
2	Regarding the possibility to upload your own shapefile with a buffer or including other adjacent/near areas to the platform of interest, this could be a mixed approach: (1) users can upload their own shapefiles; (2) users can use shapefiles previously uploaded by other users

7. Please use this space to make any other remark to the team

No.	Comment / Question/ Observation/ Reflection
1	Need to coordinate work with Vladan, tasks 4.1, 4.3 and 4.4 and WP11
2	Propose to Michael inclusion of Vladan's presentation to programme of the eLTER combined meeting in October or accommodate it in time reserved for our presentation.

Annex 5: Example of National scale geographic units – Scotland

The website <https://statistics.gov.scot/home> allows the user to explore, visualise and download over 250 datasets from a range of producers (number of data sets continually changing). The datasets have varying resolution with spatial units determined by their mode of collection. The look-up table to convert between the geographic units can be downloaded from <https://statistics.gov.scot/data/data-zone-lookup>.

- S01 - Data Zone - *DZ2011*
- S02 - Intermediate Zone - *IZ2011*
- S13 - Multi Member Electoral Wards - *MMWard*
- S12 - Local Authority - *LA*
- S16 - Scottish Parliamentary Constituencies - *SPC*
- S14 - UK Parliamentary Constituencies - *UKPC*
- S08 - NHS Health Board - *HB*
- S37 - NHS Integration Authorities - *HIA*
- S32 - Scottish Police Divisions - *SPD*
- S39 - Scottish Fire and Rescue Local Senior Officer Areas - *SFRLSO*
- S40 - Scottish Fire and Rescue Service Delivery Areas - *SFRSDA*
- S43 - Regional Resilience Partnerships – *RRP*

Details of the geographic units provided in the look up table are below, the corresponding units held within the Cairngorms LSTER platform are provided in Table 1.

1. Data zones are the core geography for dissemination of results from Scottish Neighbourhood Statistics (SNS). The data zone geography covers the whole of Scotland and nest within local authority boundaries (as they were in 2011). Data zones are groups of 2011 Census output areas which have populations of around 500 to 1,000 residents. There are 6,976 2011 Data Zones. An Output Area to 2011 Data lookup is available from the [2011 Census Indexes](https://www.scotlandscensus.gov.uk/variables-classification/sns-data-zone-2011) section of the NRS website. <https://www.scotlandscensus.gov.uk/variables-classification/sns-data-zone-2011>
2. MMWARD – Multi Member Electoral Wards - Local government in Scotland comprises 32 unitary local authorities (council areas), which are divided into wards for electoral purposes. There are currently a total of 1,227 councilors elected from 354 wards - with each ward returning 3 or 4 councilors. The Local Government Boundary Commission for Scotland is responsible for recommendations on the definition of ward boundaries, however, the definitive dataset is delineated by Ordnance Survey for inclusion in their BoundaryLine product.
3. SPA - Scottish Parliament constituency. The Scottish parliament has 73 constituencies, each electing one Member of the Scottish Parliament (MSP) by the plurality (first past the post) system of voting, and eight additional member regions, each electing seven additional MSPs.
4. UKPC - Parliamentary Constituency - 59 UK Parliamentary Constituencies (UKPCs) in Scotland - <https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/2011-based-special-area-population-estimates/ukpc-population-estimates>
5. Council or Local Authority - LA Local government comprises 32 local authorities (or councils) which provide public services, including education, social care, waste management, libraries and planning <https://www.nrscotland.gov.uk/statistics-and-data/statistics/stats-at-a-glance/council-area-profiles>

6. HB - NHS Health Board Area - 14 regional NHS Boards which are responsible for the protection and the improvement of their population's health and for the delivery of frontline healthcare services
7. HIA - NHS Integration Authorities. Integration of health and social care is one of Scotland's major programmes of reform. Following the dissolution of Community Health Partnerships, the Public Bodies (Joint Working) (Scotland) Act 2014 gave the impetus for the development of Integration Authorities. Integration Authorities represent partnerships between Local Authorities and Health Boards for delivering health and social care services and integration of budgets. There are 31 Integration Authorities in Scotland, all coterminous with their Local Authority boundary with the exception of Clackmannanshire and Stirling councils, which form a single Integration Authority.
8. TTWA A **Travel to Work Area** or **TTWA** is a statistical tool used by [UK Government](#) agencies and [local authorities](#), especially by the [Department for Work and Pensions](#) and [Jobcentres](#), to indicate an area where the population would generally [commute](#) to a larger town, city or [conurbation](#) for the purposes of [employment](#). Travel to Work Areas are defined by the [Office for National Statistics](#) using [census](#) data for commuting between [wards](#), based on the different locations of individuals' home and work addresses.
- A Travel to Work Area is a collection of wards for which "of the resident economically active population, at least 75% actually work in the area, and also, that of everyone working in the area, at least 75% actually live in the area". According to this measure, there were 243 TTWAs within the United Kingdom in 2007
9. CTRY Country Scotland. The whole country of Scotland including islands

Table A5_1 Geographic units wholly or partially within the Cairngorms LTSE Platform

Zone_name	Area_ratio for Data Zone	DataZone	InterZone	MMWard	SPC	UKPC	Council	HB	HIA	TTWA	CTRY
East Cairngorms - 01	1	S01006789	S02001285	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
East Cairngorms - 02	1	S01006790	S02001285	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
East Cairngorms - 03	0.998453267	S01006791	S02001285	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
East Cairngorms - 04	1	S01006792	S02001285	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
East Cairngorms - 05	1	S01006793	S02001285	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
Aboyne and South Deeside - 03	0.124606822	S01006796	S02001286	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
Aboyne and South Deeside - 04	0.687284315	S01006797	S02001286	S13002863	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
Aboyne and South Deeside - 05	0.002143742	S01006798	S02001286	S13002863	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
Cromar and Kildrummy - 04	0.151594956	S01006878	S02001300	S13002861	S16000078	S14000037	S12000034	S08000020	S37000002	S22000047	S92000003
Cromar and Kildrummy - 05	0.480387749	S01006879	S02001300	S13002862	S16000078	S14000058	S12000034	S08000020	S37000002	S22000047	S92000003
Angus Glens - 01	0.211136189	S01007279	S02001369	S13002867	S16000082	S14000004	S12000041	S08000030	S37000003	S22000056	S92000003
Angus Glens - 02	0.441474675	S01007280	S02001369	S13002867	S16000082	S14000004	S12000041	S08000030	S37000003	S22000056	S92000003
Angus Glens - 04	0.287213295	S01007282	S02001369	S13002868	S16000081	S14000004	S12000041	S08000030	S37000003	S22000056	S92000003
Lochaber East and North - 05	0.059141724	S01010528	S02001981	S13003000	S16000143	S14000055	S12000017	S08000022	S37000016	S22000062	S92000003
Badenoch and Strathspey South - 01	1	S01010531	S02001982	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey South - 02	0.606139634	S01010532	S02001982	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey South - 03	1	S01010533	S02001982	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey South - 04	1	S01010534	S02001982	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey South - 05	0.780628273	S01010535	S02001982	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey Central - 01	1	S01010536	S02001983	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey Central - 02	1	S01010537	S02001983	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey Central - 03	1	S01010538	S02001983	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003

Zone_name	Area_ratio for Data Zone	DataZone	InterZone	MMWard	SPC	UKPC	Council	HB	HIA	TTWA	CTRY
Badenoch and Strathspey Central - 04	1	S01010539	S02001983	S13003009	S16000143	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey Central - 05	1	S01010540	S02001983	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey Central - 06	0.872505506	S01010541	S02001983	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey North - 01	1	S01010542	S02001984	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey North - 02	0.500050487	S01010543	S02001984	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey North - 03	1	S01010544	S02001984	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey North - 04	1	S01010545	S02001984	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey North - 05	1	S01010546	S02001984	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Badenoch and Strathspey North - 06	0.610700296	S01010547	S02001984	S13003009	S16000125	S14000039	S12000017	S08000022	S37000016	S22000050	S92000003
Nairn Rural - 06	3.11E-04	S01010553	S02001985	S13003007	S16000125	S14000039	S12000017	S08000022	S37000016	S22000068	S92000003
Inverness East Rural - 01	0.001387181	S01010566	S02001988	S13003008	S16000125	S14000039	S12000017	S08000022	S37000016	S22000068	S92000003
Loch Ness - 05	4.45E-05	S01010668	S02002006	S13003001	S16000143	S14000039	S12000017	S08000022	S37000016	S22000062	S92000003
South Speyside and the Cabrach - 01	0.886946435	S01011045	S02002073	S13003024	S16000132	S14000046	S12000020	S08000020	S37000019	S22000060	S92000003
South Speyside and the Cabrach - 02	0.131004848	S01011046	S02002073	S13003024	S16000132	S14000046	S12000020	S08000020	S37000019	S22000060	S92000003
South Speyside and the Cabrach - 03	0.003119755	S01011047	S02002073	S13003024	S16000132	S14000046	S12000020	S08000020	S37000019	S22000060	S92000003
Blair Atholl, Strathardle and Glenshee - 03	0.702961118	S01011981	S02002247	S13003065	S16000137	S14000054	S12000048	S08000030	S37000033	S22000076	S92000003
Blair Atholl, Strathardle and Glenshee - 05	0.096727816	S01011983	S02002247	S13003066	S16000137	S14000054	S12000048	S08000030	S37000033	S22000076	S92000003
Rannoch and Aberfeldy - 04	0.331342886	S01012016	S02002253	S13003066	S16000137	S14000054	S12000048	S08000030	S37000033	S22000076	S92000003

Legend: InterZone - Intermediate Zone; MMWard - Multi Member Electoral Wards; SPC - Scottish Parliamentary Constituencies; UKPC - UK Parliamentary Constituencies; HB - NHS Health Board; HIA - NHS Integration Authorities; TTWA - Travel to Work Area; CTRY - The whole country of Scotland including islands