



## AGENT-BASED SUPPORT TOOL FOR THE DEVELOPMENT OF AGRICULTURE POLICIES

### D1.6 Characterisation of datasets from previous research projects



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## Executive Summary

This deliverable presents the methodology defined within the AGRICORE project to characterise datasets resulting from previous research that could be useful for performing agricultural research analysis in the future. This methodology has been developed as part of the first of the work packages defined in the AGRICORE project. AGRICORE is a research project proposing an innovative way to apply agent-based modelling to improve the capacities of policymakers to evaluate the impact of agricultural-related measurements under and outside the framework of the Common Agricultural Policy. This project was funded by the European Commission as a result of the RUR-04-2018 call, part of the H2020 programme.

In the introduction, the basis on which the methodology has been developed is presented, i.e., the ARDIT tool and the AGRICORE DCAT-AP 2.0 ontology. Then, the proposed methodology is detailed including also the definition of all the fields to be filled while characterising a dataset in ARDIT. As part of this methodology, also all the main challenges encountered during the characterisation of the datasets have been explained, illustrating the proposed solutions. After that, also the methodology proposed to guarantee that the tool ARDIT remains efficiently working is described, relying on a continuous upgrade and maintenance of the data. Finally, some conclusions regarding the characterisation process and the need for a governance strategy to ensure the survival of the ARDIT after the project are provided.

It is important to remark that although this deliverable has been developed in the framework of the AGRICORE project, the participating partners have aimed for broader usage of the proposed methodology. As the final goal of this work package, the proposed EU Index Tool (now renamed as Agricultural Research Data Index Tool (ARDIT)) aims to serve as a central entry point for locating useful datasets useful for agricultural research.

## Abbreviations

Abbreviation	Full name
AP	Application Profile
API	Application Programming Interface
ARDIT	Agricultural Research Data Index Tool
CAPRI	Common Agricultural Policy Regionalised Impact
CSV	comma-separated values
DCAT	Data Catalogue
DCAT-AP	Data Catalogue Application Profile
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FLINT	Farm Level Indicators for New Topics (in policy evaluation)
GAMS	General Algebraic Modelling System
GUI	Graphic User Interface
ICT	Information Technology
IFM-CAP	Individual Farm Model for Common Agricultural Policy Analysis
ISPRA	Istituto Superiore per la Protezione e la Ricerca Ambientale
JRC	Joint Research Centre
MCYFS	Crop Yield Forecasting System
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
UoA	Unit of Analysis
UC	User case
URL	Uniform Resource Locator
VOCAB-DQV	Data Quality Vocabulary
WP	Work Package

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# 1 Introduction

The objective of ARDIT is to support agricultural researchers in identifying the most suitable datasets based on model requirements and research questions without having to enter the resources of these databases. This will represent a great help if considering that generally just preliminary access to the dataset can result in a waste of time for the researcher in case data occurred to be inadequate (e.g. due to lack of one or more key variables). In addition, the amount of data necessary to use large-scale models, or combinations of multiple models, is likely to be enormous. Therefore, a limiting factor for (some) researchers could be to properly organise the relevant datasets by selecting or manipulating parts of them to be ready for use. Specifically, this activity has relied on having access to good and complete descriptions (i.e., metadata) of the contents of the datasets, especially on the characteristics of the variables contained in them. The methodology presented in the following sections has been developed to collect all the relevant information about datasets, such that this knowledge could be stored, manipulated and displayed employing the AGRICORE ontology. Lastly, this information will be gathered and hosted in the ARDIT, to allow researchers to identify useful data sources for them.

The proposed methodology to characterise agricultural datasets is composed of three main elements:

1. The proposed ontology: The AGRICORE DCAT-AP 2.0 Extension
2. The ARDIT tool
3. The data governance process

The data governance process has been applied within the project to characterise an extensive set of data sources covering EU-wide and local datasets (especially those relevant to the three use cases covered in the AGRICORE project). Moreover, this methodology also describes the process that should be followed after the project to provide more content in the proposed ARDIT.

As already said, one of the goals of the AGRICORE project is to provide the ARDIT as a tool for agricultural researchers to facilitate the task of identifying relevant and useful data for performing agricultural policy analysis. To do so, the AGRICORE partners devised a characterisation methodology (detailed in the next sections) for describing the available data sources and their content to enable proper mapping and searching capabilities over the gathered information. To design such a methodology, one of the key elements is the definition and adoption of an ontology (or a set of ontologies), which would allow:

- To share a **common understanding** of the structure of information among people or software agents.
- To enable the **reuse** of domain knowledge.
- To make domain **assumptions explicit**.
- To **separate domain** knowledge from the **operational** knowledge
- To **analyse** domain knowledge
- To secure the interoperability of datasets

All these motivations are present in the AGRICORE project. Indeed, to ensure the long-term usefulness of the ARDIT platform well beyond the scope of the AGRICORE project, it has been critical to develop it in a way that it is easy to upgrade and maintain as well as user-friendly for the research community as a whole. Accordingly, during the first months of the project, consortium partners performed an analysis of existing ontologies that could be used for developing the ARDIT.

In order to build the ontology used for characterising the datasets on the ARDIT, Protégé 5 <sup>1</sup>, was selected due to the large community deeming it a reliable and flexible cooperative tool available as an open-source product both in a desktop and web version. As reported by previous studies [1], it has a suite of tools to construct domain models and knowledge-based applications with ontologies. It implements a rich set of knowledge-modelling structures and actions that support the creation, visualisation and manipulation of ontologies in various representation formats. It can be customised to provide domain-friendly support in creating knowledge models and entering data. Also, it can be extended by a plug-in architecture and Java-based API for building knowledge-base tools and applications. Protégé allows the definition of classes, class hierarchy variables, variable-value restrictions, and the relationships between classes and the properties of these relationships.

Within the next phases of the AGRICORE project, the ontology will allow the application of semantic queries in ARDIT for searching datasets information and characterisations. Likewise, it will allow a continuous enrichment of the number and quality of datasets characterisations through the ARDIT Graphic User Interface (GUI) tailored to fit the data model structure described by the ontology.

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<sup>1</sup> <http://protegeproject.github.io/protege/getting-started/>



## 2 Datasets from previous research results

Several European projects developed datasets with the objective of collecting data for policymaking, however, most of these datasets are not publicly available.

The choice to characterise tables from already developed projects was made in order to have the possibility to use the results as a starting point for the AGRICORE project.

The research focused on agro-economic projects in which public data tables were created, or it was specified from which EU data providers (e.g. EUROSTAT) the data were taken. An online search was carried out on specialised sites and the page dedicated to EU-funded projects was consulted. Some projects were suggested by project partners and by interviews with researchers out of the AGRICORE project.

The IFM-CAP project (Individual Farm Model for Common Agricultural Policy Analysis), a project carried out by the Joint Research Centre, was considered. This project aims at developing an individual farm-level simulation model. This model is a supply model and it is built on the EU-FADN data (data such as utilised agricultural area (arable & grassland), obligatory set-aside rate, sugar quota right (when available), set of crop and livestock activities, yields, prices & subsidies, observed activity levels, farm-level feed costs, farm weighting factor and land rental prices (prior)) complemented by other relevant EU-wide data sources such as the Eurostat, Farm Structure Survey (FSS) (from which data on yields for fodder crops at MS level and carcass weights were taken) and CAPRI databases (with data such as prices for fodder crops at MS level, feed prices at MS level, feed nutrient content, prices and yields trend, animal feed requirement functions (prior) and elasticities for feed demand at NUTS 2 level (prior)). The whole FADN farm constant sample between 2007 and 2009 was individually modelled, however, the data source they compiled, remains of no direct access, in the context of this project.

The CAPRI (Common Agricultural Policy Regionalised Impact) model is a tool to forecast the economic and environmental impact assessment of agricultural and international trade policies with a focus on the European Union. It is a successful economic model developed by European Commission research funds and it supports decision making related to the Common Agricultural Policy based on sound scientific quantitative analysis<sup>2</sup>. CAPRI is maintained by a network of different European research institutions and managed by teams from different countries. Its main client is the EU Commission (Directorate-Generals for Agriculture and Rural Development and for the Environment).

The main limitation of both datasets is the lack of information from the FADN with respect to crop-specific production costs for each farm covered by the field of observation in the FADN. In both datasets, the culture-specific costs are estimated as econometric methodologies. However, it has to be considered that the datasets used by IFM-CAP and CAPRI, are "model specific" as they are developed on the specific characteristics of the models and would hardly fit other models, even of the same type.

Data contained in the CAPRI Modelling System focus on EU27, Norway, Turkey and Western Balkans, covering about 280 regions or up to ten farm types for each region. In the database are reported about 50 activities based on Economic Accounts of Agriculture, farm/market balances and unit value prices at the national level (about 60 products and 35 inputs) and policy variables at regional/national and EU levels (such as premiums, set-aside, quotas, tariffs, administrative prices, etc.).

The objective of this data is to assess the ex-ante impacts of the Common Agricultural Policy and trade policies on production, income, markets, trade and environment, from global to regional scale. The economic model and database generation are realised in GAMS (General Algebraic

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<sup>2</sup> <https://www.capri-model.org/dokuwiki/help/doku.php?id=start>



Modelling System) and are sourced mainly by Eurostat and FAOSTAT, making a major effort to build a complete, closed and consistent agricultural database across scales. Moreover, in this case, the CAPRI database could not be used because data are secreted and not available for the public.

## 2.1 Selected datasets

The FLINT project developed a data infrastructure needed by the agri-food sector and policymakers to provide up to date information on farm-level indicators on sustainability and other relevant new issues. Better decision making is facilitated by taking into account the sustainability performance of farms on a wide range of relevant topics, such as market stabilisation; income support; environmental sustainability; climate change adaptation and mitigation; innovation; and resource efficiency. The approach explicitly considered the heterogeneity of the farming sector in the EU and its member states. Together with the farming and agri-food sector, the feasibility of these indicators was determined. FLINT takes into account the increasing needs for sustainability information by the national and international retail and agri-food sector. FLINT established a pilot network of more than 1000 farms (representative of farm diversity at the EU level, including the different administrative environments in the different MS) that is well suited for the gathering of these data<sup>3</sup>.

Given the little availability of data in tabular format, it was opted to select some tables present in projects reports. Among the tables in the reports, it was decided to characterise those considered to be more unusual, with data that are difficult to find elsewhere.

Another project that provides freely accessible data is the AGRI4CAST project<sup>4</sup>. This project has been carried out by the JRC to support the European Commission collecting information on crop production during the current growing season in order to implement the EU's Common Agricultural Policy (CAP). The MARS project was launched in 1988 to collect these data. The AGRI4CAST infrastructure for climate change and agriculture research was built on the back of the MARS weather database. "In-house" development of new modelling capabilities and tools has been the primary source of new capabilities and tools. The component-oriented programming paradigm is used to construct software tools, resulting in distinct software parts that can be reused by third parties.

The Food Security Unit of the European Commission's JRC in ISPRA (Italy) now houses the crop monitoring and yield forecasting work within the AGRI4CAST/MARS4CAST project. Crop Yield Forecasting System MCYFS is the operational ICT infrastructure working in an operational setting and is regularly updated and upgraded.

Among the regions covered by MCYFS are Europe, Russia/Kazakhstan, China, India, South America and Africa, as well as a worldwide area of application. Observed weather, weather forecasts and remote sensing data are all used in this system. Soil maps, crop calendars, and administrative yield figures all fall under the category of static input data. These inputs can be used to replicate agricultural conditions. The yield numbers are updated on a regular basis. Crop-specific end-of-season yield predictions are made using a combination of weather data, crop simulation findings, and remote sensing data. The data can be accessed, analysed, and displayed using software tools. The MARS4CAST project team is in charge of agricultural analysis and publication of the JRC MARS Bulletins, quality control of the system, and future research and development, while external contractors at the European Commission handle the MCYFS' operational needs.

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<sup>3</sup> <https://www.flint-fp7.eu/index.html>

<sup>4</sup> <https://agri4cast.jrc.ec.europa.eu/DataPortal/Index.aspx>

The following reasons behind our choice of characterising the selected datasets of AGRI4CAST can be listed:

- Data from AGRI4CAST can be accessed by anyone for free.
- The data sets' information technology infrastructure is operational, continually updated and improved.
- The purpose of the AGRI4CAST data source is well aligned with the AGRICORE project's goals.
- Weather observations, forecasts, and remote sensing are all incorporated into the system.
- Input data consists of soil maps, crop calendars, and administrative yield estimates
- The input data can be used to replicate crop conditions. The yield figures are updated frequently.
- Software tools make it possible to gain access to, analyse, and show data.
- The data of AGRI4CAST enables the prediction of crop-specific end-of-season yields.
- AGRI4CAST provides geo-referenced datasets which is an important feature combined into data characterisation in ARDIT within the AGRICORE project.

The table below contains all the datasets that have been identified and characterised in the context of Task 1.6, depicting the provider and the location of the dataset in the institutional repository, in terms of the folder and sub-folder.

**Table 1: List of datasets characterised within AGRICORE Task T1.6**

Related project	Producer	Folder/Dataset Name
FLINT		FLINT-Risk management
FLINT		Farm economy sustainability in the EU
FLINT		FLINT - Water footprint
FLINT		FLINT- Soil organic matter management
FLINT		FLINT - Tradeoffs between economic, environmental and social sustainability
AGRI4CAST	JRC	Gridded Remote Sensing Data in Europe
AGRI4CAST	JRC	Yearly modelled crop area in EU at grid level
AGRI4CAST	JRC	Gridded winter soft wheat phenological database for Europe
AGRI4CAST	JRC	Gridded Remote Sensing Long Term Average in Europe
AGRI4CAST	JRC	Daily weather data for crop modelling over Europe derived from climate change scenarios
AGRI4CAST	JRC	Crop Calendar
AGRI4CAST	JRC	Crop yield simulations on RCP

## 2.2 Characterisation within the project duration

During Task 1.1, project partners performed an initial characterisation of a number of datasets (listed in the table in Selection of Datasets Characterised so Far of D1.1) to identify the information that had to be captured by the ARDIT ontology and defined the necessary information required for further characterisation in ARDIT.

Consequently, the ARDIT back end has been organised in 7 sections:

1. One **GENERAL** section where information such as the name of the table, the description, the type of dataset, the producer, issue date and last update, etc., are captured. In this category, users can indicate the catalogue to which the dataset belongs (EUROSTAT, FAO, OECD, etc.). Spatial resolution is a characteristic dedicated to geo-referenced datasets to depict the minimum spatial separation resolvable in a dataset, measured in meters, while temporal resolution is intended to provide a summary indication of the distance of time between two succeeding measurements or images of the same area. More complex descriptions of various aspects of temporal precision, accuracy, resolution and other statistics can be provided using the Data Quality Vocabulary [VOCAB-DQV]<sup>5</sup>. In this section, the activities that generated or provided the business context for the creation of the dataset ("Was generated by") can also be found. An activity is something that occurs over a period of time and acts upon or with entities; it may include consuming, processing, transforming, modifying, relocating, using, or generating entities. The activity associated with generation of a dataset will typically be an initiative, project, mission, survey, ongoing activity ("business as usual"), etc. Ultimately, if the dataset is cited in the literature, or on other datasets or used by some other related resources, such as publications, etc., this information can be depicted in the field "Is referenced by".
2. The second section is dedicated to the **PURPOSE** of the dataset, and define what kind of analysis the dataset was created for. The purpose property has been added in the AGRICORE ontology and it identifies the purpose of the dataset, i.e., for what kind of analysis that dataset has been created: there is an internal vocabulary of terms that will be enriched over time. This section gathers information on the temporal extent of the data collection period, on the object of the dataset (i.e., the type of data that has been analysed and represented), on the purposes of the dataset and the data, and on the theme covered (derived from DCAT-AP).
3. The **GEOGRAPHICAL COVERAGE** section depicts the geographic features of a dataset. It is a spatial property that consists of a list of spatial regions or named places. It can be represented using a controlled vocabulary or with geographic coordinates.
4. The **DISTRIBUTION** of a data set is the format in which the data can be retrieved. A dataset might be available in multiple formats, such as spreadsheet, pdf, CSV, etc. This section, besides information on title, issue date and description, collects all data on access rights, byte size, procedures to access the data, URL and format.
5. The **UNIT OF ANALYSIS** (UoA) is the object to which the variables are referred. Every dataset has at least one UoA, but in one dataset there could be more than one UoA. The UoA is generally something spatially defined, such as the holdings, a region or a country, but it can also be something different such as a commodity. While defining a new Unit of Analysis, the following information will be captured: the temporal extent (that could have a different value from one of the datasets), the aggregation level, unit or scale, whether the dataset is a census, the population coverage if not a census, the statistically representativeness or the number of the sample, if known and the downscaling strategy, if any.

Once the UoA has been created, the variable related to are characterised through: unit of measurement, temporal extent, mathematical representation, data frequency, aggregation level and UoA to which the variable refers. In case of price variables, currency, price type and size unit will be depicted as well.

6. In ARDIT there is also a section to list the **KEYWORDS** describing or representing the dataset. The table below depicts the list of fields to be filled while characterising a dataset in ARDIT.

<sup>5</sup> [https://www.w3.org/TR/vocab-dcat-2/#Property:dataset\\_temporal\\_resolution](https://www.w3.org/TR/vocab-dcat-2/#Property:dataset_temporal_resolution)

**Table 2: Template for the ARDIT Dataset Characterisation (Methodological Grid)**

Characteristic captured and presented in ARDIT	Explanation/Example
<b>GENERAL</b>	This section regards general information and characteristics about the dataset.
<b>Title</b>	Name or identifier of the dataset.
<b>Description</b>	Short description of the dataset, its purpose or the type of data collected.
<b>Issued</b>	Indicates the date of the first formal issuance or publication of the specific dataset.
<b>Last update</b>	Indicates the most recent date on which the dataset was changed, updated or modified.
<b>Dataset type</b>	A dataset can be either geo-referenced or socioeconomic. The dataset type is usually determined by the type of its Units of Analysis or the type of its variables.
<b>Producer</b>	Indicates the institution/organisation which generated, published or maintains the dataset.
<b>Link</b>	Provides an URL to the landing page of the described dataset.
<b>Language</b>	Indicates the original language in which the data and metadata are available
<b>Periodicity of the publication</b>	Indicates the frequency with which the data (variables) is updated (between one issue and the following one).
<b>Catalogues</b>	Indicates the catalogue to which the dataset belongs (if any).
<b>Temporal resolution</b>	Indicates the shortest period of time between two consecutive samples of any of the variables contained within the dataset.
<b>Spatial resolution</b>	(Only for geo-referenced datasets) Indicates the smallest resolvable spatial separation (measured in metres) between neighbouring Units of Analysis, and thus between their corresponding geo-referenced variables.
<b>Resource type</b>	Indicates the nature or genre of the resource (e.g. collection, interactive resource)
<b>Was generated by</b>	Indicates the activities that generated or provided the business context for the creation of the dataset.
<b>Is referenced by</b>	Indicates other datasets or scientific publications that cite or (re)use data contained in the dataset being described.
<b>PURPOSE</b>	This section depicts what kind of analysis the dataset was created for.
<b>Temporal extent</b>	Indicates the time period for which data are available.
<b>Subjects</b>	Indicates the topics covered by the dataset.
<b>Useful for the analysis of (purpose)</b>	Indicates which types of analysis could be performed using the data contained in the dataset's variables.
<b>Theme covered</b>	Indicates the themes covered by the dataset.
<b>GEOGRAPHICAL COVERAGE</b>	This section describes the geographical scope of the dataset. It is therefore a property describing a particular physical or administrative spatial entity. It is possible to describe the geographical coverage using several alternatives (but only one of them at a time): list with 1+ physical continents <i>OR</i> list with 1+ countries <i>OR</i> list with 1+ NUTS1 entities <i>OR</i> list with 1+ NUTS2 entities <i>OR</i> list with 1+ NUTS3 entities <i>OR</i> list with 1+ ADM1 geo-entities <i>OR</i> list with 1+ ADM2 geo-entities. In future releases, it will be also possible to use a coordinates box for this.
<b>DISTRIBUTIONS</b>	The distributions of a dataset are the set of different formats/shapes in which the data can be retrieved. (e.g. pdf, CSV)
<b>License</b>	Indicates the legal framework under which the distribution is made available
<b>Access right</b>	Indicates a declaration on the rights that concerns how the distribution is accessed. (e.g. public, restricted)
<b>Byte size</b>	Indicates the memory size required to store the data contained in the dataset.
<b>Procedures to access the data</b>	Describes the guidelines and procedures required for accessing private datasets.
<b>Access URL</b>	Indicates the URL from where the data contained in the dataset can be accessed.
<b>Download URL</b>	Indicates the URL of the downloadable file in a given format (if exists).
<b>Format</b>	Indicates the file format of the raw data file (e.g. xls, csv, html, pc).
<b>Compress format</b>	Indicate the compression format (if any) of the downloadable file in which the data is contained.

<b>Packaging format</b>	Indicates the packaging format of the distribution when several data files are grouped together.
<b>Data service</b>	Indicates the data service that gives access to the distribution of the dataset.
<b>Publisher</b>	The entity responsible for making the data service available.
<b>Creator</b>	The entity responsible for producing the data service.
<b>UNIT OF ANALYSIS</b>	It's the object to which the variables refer. Every dataset has at least one UoA.
<b>Area size</b>	(Only for geo-referenced datasets) Indicates the spatial magnitude of the unit of analysis.
<b>Area size unit</b>	(Only for geo-referenced datasets) Indicates the physical unit corresponding to the magnitude of area size of the UoA.
<b>Aggregation Level</b>	Number of Units of Analysis for which the data is aggregated / Area size for which the Units of Analysis are aggregated.
<b>Aggregation Level Unit</b>	Political-Administrative or physical unit of the aggregation level (e.g. the Unit of Analysis can be the Agricultural Holdings, whose results are aggregated at a national (country) level).
<b>Census</b>	Boolean property that indicates whether the dataset is a census (100% of Units of Analysis were polled to gather the data).
<b>Population coverage</b>	Indicates (when known) the proportion of Units of Analysis sampled with respect to the size of the total population of Units of Analysis. Could be either a float between 0 and 1 or a percentage between 0 and 100.
<b>Unit of analysis number</b>	Indicates the total number of Units of Analysis that form the sample.
<b>Statistical representativeness</b>	Provides information on how the sample was built. It is a value between 0 and 1 that refers to what percentage of the total real population of units of analysis is represented by the sample used to generate the dataset.
<b>Available stratification criteria &amp; suggested downscaling methodologies</b>	Indicates which additional stratification levels are resolvable within the dataset (i.e. the criteria to filter among Units of Analysis and their possible values). Additionally, for data available at higher (geographical or administrative) scale levels, methodologies can be suggested to generate data at smaller scales.
<b>VARIABLES INCLUDED</b>	It lists all the variables contained within the dataset. Those variables can be geo-referenced or socioeconomic, depending on the dataset and Unit of Analysis types.
<b>Name</b>	Identifier of the variable.
<b>Unit of Measurement</b>	Physical unit in which the variable is displayed.
<b>Temporal extent</b>	Indicates the time period for which data are available. Normally it has the same value as the dataset's temporal extent, but it might be also different (shorter) for some variables.
<b>Mathematical representation</b>	Indicates whether the value of the variable is an instantaneous value, or an extreme value (maximum, minimum), or the average of several values, etc.
<b>Data frequency</b>	To indicate the frequency with which data are collected and processed during the "temporal extent". (e.g.: dataset with two variables for temperature, one is the monthly average, another one is the maximum annual temperature )
<b>Aggregation level</b>	To indicate the spatial units of the data (e. g., NUTS1, NUTS2, NUTS3 or other administrative regions/units, 50000 (e.g., 1:50000 scale map), 0.25 degrees). It refers to the level of detail of the data set/ analysis. It shall be expressed as a set of zero to many resolution distances (typically for gridded data and imagery-derived products) or equivalent scales (typically for maps or map-derived products).
<b>Data origin</b>	Indicates whether the values of the variable have been obtained by actual physical measurements or surveys (measured), <i>OR</i> by qualitative observation (observed), <i>OR</i> by calculations on other raw variables (calculated), <i>OR</i> are predictions obtained using models or other forecasting techniques (forecast).
<b>Reference Values</b>	Sometimes variables are coded (or modified) using value identifiers generated by the dataset producers themselves. This property may include such codes and their meaning (or their modifying value) in natural language.
<b>Unit of analysis</b>	Indicates the UoA the variable is related to.
<b>KEYWORDS</b>	This section is to indicate the keywords regarding the dataset.



In this framework, STAM took care of keeping updated the ontology, while IDENER of communicating the required changes and adaptations both to the ARDIT developers and to the data providers (people performing the characterisations). UNIPR was in charge of the characterisation of the socioeconomic datasets, STAM was in charge of the characterisation of the geo-referenced datasets and IDENER took the role of supervisor and reviewer of the work done.

The list of datasets, characterised in the context of this deliverable, will be continuously updated throughout the project period to address any additional need, identified by the project modelers.

An iterative approach will allow maturing the governance structure aiming for its maintenance after the project finalisation. In the current stage, the AGRICORE partners have established that for each dataset to be included in the platform, a reviewer of the quality of its characterisation is defined.

During the project an extensive list of characterization of the required datasets has been already produced. Nonetheless, as coordinator of the project, IDENER will be in charge of monitoring any additional data characterisation need identifying within the execution of the UCs. Any additional need will be notified by the UC responsible to the coordinator and the actions required to tackle it.

Finally, a special committee formed by representatives of STAM, UNIPR and IDENER will be formed. This Committee will be tasked with the continuous monitoring of the characterisation process, identifying the relevant aspects that may require a modification of the current ontology.

## 2.3 Characterisation challenges

The biggest challenge in the characterisation of the dataset resulting from previous research was to identify suitable projects because most datasets, produced in the context of EC and national projects, are not publicly accessible. Often the only available data, in tabular form, are included in project reports, mainly in pdf format, and missing the majority of information required to have a complete characterisation in ARDIT.

The few tables, available in pdf documents, that have been selected according to their usefulness/relation to the AGRICORE project, contain very general data. In some cases (FLINT), it was not even possible to find a reference year for the data reported on the tables nor the countries the data were referred to.

During the characterisation of some of the geo-referenced datasets from AGRI4CAST, the only challenge was to enter the information about the temporal extent of the data. While the majority of the datasets contain the temporal extent information, some geo-referenced datasets did not give any information about the starting and ending dates of the data set and the only provided information when these datasets are downloaded is the ID number of the grid and countries that they belong. So it is not possible to be sure about the length and date of the dataset. As the information for temporal extent of data is required to be able to create a characterisation on ARDIT, it was not possible to characterise these types of datasets to the system.

## 2.4 Characterisation after the project

Upon completing the activities of the AGRICORE project and having published the ARDIT on the public internet, researchers interested in using and contributing to the tool with the characterisation of new datasets will be able to do so by means of the same functionality employed by project partners in the lifetime of the project. It is obvious that for ensuring the



survival of the developed portal, a continuous upgrade and maintenance of the data included should be promoted. To do so, a clear governance structure should be defined.

Although the final version of such governance will be established later in the project (as this relies on the activities pertaining to other WPs and tasks, such as WP8, Exploitation, clustering and open sourcing, and WP9 with the PEDR and DMP), an initial potential governance structure is already under discussion.

The ARDIT tool will be developed to include a Datasource life cycle management system. This system, among other things, will establish a set of roles within the platform which will be linked to specific responsibilities. The corresponding roles will be defined within the project by both AAT and IDENER and the people assigned with them will be identified; initially within the personnel of such companies. However, project activities already include efforts to increase the adoption and interest in the project tools (including ARDIT) and external requests from potential contributors are expected.

### 3 Conclusion

Agricultural research and agricultural policy impact assessment is normally supported by the analysis of several datasets with different characteristics and their own complexity. Some datasets are statistically oriented (such as Eurostat), following the evolution of statistical macroeconomics phenomena by giving a structural or cognitive overview. They might be used to make a forecast analysis (ex-ante analysis) or a policy evaluation (ex-post). Some other datasets are policy-oriented (such as FADN), providing specific information for policymakers and for specific policy sectors (fisheries, environment, agriculture etc.). Such datasets can be implemented by governments or international organisations oriented towards specific objectives, such as the fight against world hunger, rural development, etc. Therefore, datasets are created for a specific purpose and follow specific generation methodologies. A dataset must allow researchers to obtain information in the most efficient way, timely and functionally. To that end, it should contain those variables that are most common or most widely used, using appropriate units of analysis and standardised units of measurement. But it should also ensure that the information on these and other characteristics (the dataset metadata) is publicly available and easily interpretable by researchers during the phase of identifying and searching for relevant data. The tools to reach this objective are the ontologies, which allow a common way of conceptualising the characteristics of datasets, allowing easy extraction of metadata and grouping of datasets with similar properties. The quality and usefulness of these datasets descriptions depend on the quality and efficiency of the ontologies used by researchers as a basis to characterise them.

In the scope of the AGRICORE project, a new dedicated ontology (AGRICORE DCAT 2.0) was designed to capture the information needed down to the level of the variables. This ontology constitutes the base for the structural design of the Agricultural Research Data Index Tool (ARDIT), a web-based tool that allows the characterisation of agricultural datasets and their subsequent search and query.

In Task 1.6, 12 tables from 2 projects (FLINT and AGRI4CAST) were characterised. These characterisations have been included as an ANNEX to this deliverable. Additionally, the [JSON file](#) containing all the characterisations corresponding to tasks T1.3, T1.4, T1.5 and T1.6 of the AGRICORE Project has been uploaded to ZENODO<sup>6</sup>.

Characterisations of datasets are the result of human-made decision processes based on human-designed ontologies. Therefore, every characterisation is a dynamic outcome subject to modifications, either because someone else suggests a better way of describing some of its properties using the ontology, or because the ontology itself undergoes modifications to improve the way of describing certain characteristic(s). Therefore, there must be an overall process management approach to ensure the quality of the resulting products (the characterisations), i.e. the ability to keep useful and accurate information about the datasets and to access it easily and quickly. The former will be included as part of the ARDIT design to be submitted in M31. Furthermore, a governance structure for the ARDIT itself is important to guarantee the quality of the characterisation procedures during the project phase, but also to ensure proper management, information provisioning and tool maintenance in the future post-project stage.

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<sup>6</sup>[Zenodo](#) is a general purpose open access repository developed under the European OpenAIRE programme and operated by CERN.

## 4 References

- [1] <sup>^</sup> E. Alatrish, “Comparison Some of Ontology Editors,” Management Information Systems, vol. 8, no. 2, pp. 18–24, 2013, [Online].

Available:

[https://pdfs.semanticscholar.org/bdf8/056feec90b60c338d3818a20e17c4b199458.pdf?g\\_a=2.36105125.422640853.1595319726-1671690332.1587569242](https://pdfs.semanticscholar.org/bdf8/056feec90b60c338d3818a20e17c4b199458.pdf?g_a=2.36105125.422640853.1595319726-1671690332.1587569242)

For preparing this report, the following deliverables have been taken into consideration:

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination Level	Due date
D1.1	<a href="#">Standardised Methodology and Set of Ontologies for the Characterisation of Data Sources</a>	UNIPR	Report	Public	M09
D1.3	EU statistics datasets	UNIPR	Report	Public	M29
D1.4	Geo-referenced datasets	STAM	Report	Public	M29
D1.5	National and Regional datasets	UNIPR	Report	Public	M29

## Annex: Characterised data sources from previous projects

<a href="#">Yearly modelled crop area in EU at grid level .....</a>	<a href="#">19</a>
<a href="#">Crop Calendar .....</a>	<a href="#">21</a>
<a href="#">FLINT - Trade-offs between economic, environmental and social sustainability .....</a>	<a href="#">23</a>
<a href="#">FLINT- Soil organic matter management.....</a>	<a href="#">43</a>
<a href="#">Crop yield simulations on RCP.....</a>	<a href="#">46</a>
<a href="#">FLINT - Farm economy sustainability in the EU.....</a>	<a href="#">48</a>
<a href="#">Gridded winter soft wheat phenological database for Europe.....</a>	<a href="#">51</a>
<a href="#">Daily weather data for crop modelling over Europe derived from climate change scenarios.....</a>	<a href="#">54</a>
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# Yearly modelled crop area in EU at grid level

## General information

**Description:** Yearly modelled crop area in EU at grid level

**Producer:** JRC

**Link:** <https://agri4cast.jrc.ec.europa.eu/DataPortal/Index.aspx>

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:** crop production, Agriculture, fisheries, forestry and food, Land cover

**Useful for the analysis of:** Agriculture policy, Environmental policy

**Themes covered:**

**Spatial resolution (in meters):** 25000.0

**Temporal resolution:** yearly

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** GEOREFERENCED

**Characterization last update:** January 14, 2022

**Characterization created at:** January 9, 2022

**Issued:** September 26, 2017

**Last update:** September 26, 2017

**Periodicity:** Annual

**Temporal extent:** January, 1975 - December, 2017

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
CSV	CSV	Public		CSV	False
plain text	Plain text	Public		Plain text	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Area size	Area size unit
25X25 grid	January, 1975 - December, 2017	kilometre	25	kilometre

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
modeled crop area	Georeferenced variable		January, 1975 - December, 2017			
Absolute ratio	Georeferenced variable		January, 1975 - December, 2017			



# Crop Calendar

## General information

**Description:** This resource contains 3 PDF files. They report the crop calendars in the European Union (EU) at national level for: winter wheat, (soft and durum), grainz maize and rice. The calendars are defined according to three macro-phenological phases. 1) from planting to early vegetative stages. 2) from vegetative to reproductive stages. 3) from ripening to harvest stages. The data are coming from expert knowledge evaluation.

**Producer:** JRC (The data are coming from expert knowledge evaluation)

**Link:** <https://agri4cast.jrc.ec.europa.eu/DataPortal/index.aspx?o=d>

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:** Agriculture, fisheries, forestry and food

**Useful for the analysis of:** Crop production

**Themes covered:**

**Spatial resolution (in meters):**

**Temporal resolution:**

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** SOCIOECONOMIC

**Characterization last update:** January 14, 2022

**Characterization created at:** January 14, 2022

**Issued:** June 3, 2015

**Last update:**

**Periodicity:** Annual

**Temporal extent:** January, 2014 - December, 2014

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
PDF	PDF	Public		PDF	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Population coverage	Unit of analysis number
macro-phenological phase from planting to early vegetative stages for winter wheat, (soft and durum), grainz maize and rice	January, 2014 - December, 2014			
Months for macro-phenological phases from vegetative to reproductive stages for winter wheat, (soft and durum), grainz maize and rice	January, 2014 - December, 2014			
Months of macro-phenological phases from ripening to harvest stages for winter wheat, (soft and durum), grainz maize and rice	January, 2014 - December, 2014			

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
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# FLINT - Trade-offs between economic, environmental and social sustainability

## General information

**Description:**

**Producer:** FLINT

**Link:** <https://www.flint-fp7.eu/downloads/reports/D5.2l.pdf>

**Languages:** English

**Catalogue:**

**Subjects:** bioeconomy

**Useful for the analysis of:**

**Themes covered:**

**Spatial resolution (in meters):**

**Temporal resolution:**

**Resource type:** Collection

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** SOCIOECONOMIC

**Characterization last update:** December 16, 2021

**Characterization created at:** December 16, 2021

**Issued:**

**Last update:**

**Periodicity:** Irregular

**Temporal extent:** January, 2015 - December, 2015

**Keywords:** tradeoff

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
PDF	PDF	Public		PDF	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Population coverage	Unit of analysis number
Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops	January, 2014 - December, 2015			
Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture	January, 2014 - December, 2015			
Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops	January, 2014 - December, 2015			
Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock	January, 2014 - December, 2015			
Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores	January, 2014 - December, 2015			
Average indicators of economic, environmental and social sustainability of	January, 2014 - December, 2015			

the clusters of type of farming 6 - Mixed cropping				
Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock	January, 2014 - December, 2015			
Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock	January, 2014 - December, 2015			

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Output per ha	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average

						indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Output per LU	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Output per capital	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social



						sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Output per AWU	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of

						farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Operational costs to output	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Farm NVA per ha	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of

						economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Farm NVA per LU	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental

						sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Farm NVA per capital	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Farm NVA per AWU	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 -

						Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Family farm income per FWU	Socioeconomic variable	Euros	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average

						indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
GHG emissions per ha	Socioeconomic variable	t eq CO2	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
GHG emissions per LU	Socioeconomic variable	t eq CO2	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of



						the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
GHG emissions per 1000 Euros of output	Socioeconomic variable	t eq CO2	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops

						of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
N balance per ha	Socioeconomic variable	kg N	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops

N balance per LU	Socioeconomic variable	kg N	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
N balance per 1000 Euros of output	Socioeconomic variable	kg N	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average

						indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Water consumption per ha	Socioeconomic variable	cubic meters	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops

Water consumption per LU	Socioeconomic variable	cubic meters	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Water consumption per 1000 Euros of output	Socioeconomic variable	cubic meters	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average

						indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Share of EFA	Socioeconomic variable	%	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops

Share of extensive grassland	Socioeconomic variable	%	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Share of UAA with nitrate risk	Socioeconomic variable	%	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average

						indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Share of UAA with erosion mitigation	Socioeconomic variable	%	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops



Quality of life	Socioeconomic variable	(scale 0-10)	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Stress	Socioeconomic variable	(scale 0-10)	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 – Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 – Granivores, Average

						indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops
Social engagement	Socioeconomic variable	(scale 0-10)	January, 2014 - December, 2015		Irregular	Average indicators of economic, environmental and social sustainability of the clusters of type of farming 2 - Horticulture, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 3 - Permanent crops, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 4 - Grazing livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 5 - Granivores, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 6 - Mixed cropping, Average indicators of economic and environmental sustainability of the clusters of type of farming 7 - Mixed livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 8 - Mixed crops-livestock, Average indicators of economic, environmental and social sustainability of the clusters of type of farming 1 - Field crops

# FLINT- Soil organic matter management

## General information

**Description:** This report compares three indicators for farm-level SOM management using FLINT data and FADN data and coefficients from standard data tables.

**Producer:** FLINT

**Link:** <https://www.flint-fp7.eu/downloads/reports/D5.2n.pdf>

**Languages:** English

**Catalogue:**

**Subjects:** soil resources, crop production, Agriculture, fisheries, forestry and food, Soil

**Useful for the analysis of:** Crop production, Agriculture policy

**Themes covered:**

**Spatial resolution (in meters):**

**Temporal resolution:**

**Resource type:** Dataset

**Was generated by:** FLINT, FADN

**Is referenced by:**

**Geographical coverage:** Germany, Spain, Finland, France, Greece, Hungary, Ireland, Netherlands, Poland

**Dataset type:** SOCIOECONOMIC

**Characterization last update:** December 16, 2021

**Characterization created at:** December 16, 2021

**Issued:**

**Last update:**

**Periodicity:** Annual

**Temporal extent:** January, 2014 - December, 2015

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
PDF	PDF	Public	<a href="https://www.flint-fp7.eu/downloads/reports/D5.2n.pdf">https://www.flint-fp7.eu/downloads/reports/D5.2n.pdf</a>	PDF	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Population coverage	Unit of analysis number
Type of farming	January, 2014 - December, 2015	Country		
FLINT partner country	January, 2014 - December, 2015	Country		
Production system	January, 2014 - December, 2015	Country		

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Specialist field crops	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Specialist horticulture	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Specialist permanent crops	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Specialist grazing livestock	Socioeconomic variable	number/average UAA ha/CountPractices/Average	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country

		SOM index/SOM balance kg Humus C/ha				
Specialist granivores	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Mixed cropping	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Mixed livestock	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Mixed crop-livestock	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming
Total sample (for SOM)	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Type of farming, FLINT partner country
Conventional	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Production system, FLINT partner country
Organic	Socioeconomic variable	number/average UAA ha/CountPractices/Average SOM index/SOM balance kg Humus C/ha	January, 2014 - December, 2015	Instant value	Annual	Production system, FLINT partner country

# Crop yield simulations on RCP

## General information

**Description:** Results of crop yield simulations on Representative Concentrations Pathway (RCP) aggregated at NUTS 2 level for EU with Norway and Switzerland (Simulated crops are Wheat, Maize, Barley, Rye, Field Beans, Sugar Beet, Rapeseed, Potato, Sunflower, Rice.)

**Producer:** JRC

**Link:** <https://agri4cast.jrc.ec.europa.eu/DataPortal/index.aspx?o=d>

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:** food security, Agriculture, fisheries, forestry and food

**Useful for the analysis of:**

**Themes covered:**

**Spatial resolution (in meters):** 25000.0

**Temporal resolution:**

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** GEOREFERENCED

**Characterization last update:** January 14, 2022

**Characterization created at:** January 14, 2022

**Issued:** December 12, 2014

**Last update:**

**Periodicity:** Annual

**Temporal extent:** January, 1960 - December, 2060

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
CSV	CSV	Public		CSV	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Area size	Area size unit
GRID	January, 1960 - December, 2060		625	square kilometre

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Potential Yield Storage	Georeferenced variable		January, 1960 - December, 2060			
Water Limited Yield Storage	Georeferenced variable		January, 1960 - December, 2060			
Crop Name	Georeferenced variable		January, 1960 - December, 2060			
Country	Georeferenced variable		January, 1960 - December, 2060			

# FLINT - Farm economy sustainability in the EU

## General information

**Description:**

**Producer:** FLINT

**Link:** <https://www.flint-fp7.eu/downloads/reports/D5.2g.pdf>

**Languages:** English

**Catalogue:**

**Subjects:** bioeconomy

**Useful for the analysis of:** Farm economic size

**Themes covered:**

**Spatial resolution (in meters):**

**Temporal resolution:**

**Resource type:** Collection

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Germany, Spain, Finland, Greece, Hungary, Ireland, Netherlands, Poland

**Dataset type:** SOCIOECONOMIC

**Characterization last update:** December 16, 2021

**Characterization created at:** December 16, 2021

**Issued:**

**Last update:**

**Periodicity:** Irregular

**Temporal extent:** January, 2004 - December, 2014

**Keywords:** economy

## Distributions



Title	Format	Access rights	Access URL	Compress format	Data service
PDF	PDF	Public		PDF	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Population coverage	Unit of analysis number
Member State	January, 2004 - December, 2014	Country		

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Number of farms	Socioeconomic variable	Number	January, 2004 - December, 2014		Irregular	Member State
FFI	Socioeconomic variable	Euros	January, 2004 - December, 2014		Irregular	Member State
COC	Socioeconomic variable	Euros	January, 2004 - December, 2014		Irregular	Member State
Unpaid labour input	Socioeconomic variable	h	January, 2004 - December, 2014		Irregular	Member State
Unpaid labour input	Socioeconomic variable	FWU	January, 2004 - December, 2014		Irregular	Member State
Paid labour input	Socioeconomic variable	h	January, 2004 - December, 2014		Irregular	Member State
Paid labour input	Socioeconomic variable	AWU	January, 2004 - December, 2014		Irregular	Member State
Off-farm employment rate	Socioeconomic variable	%	January, 2004 - December, 2014		Irregular	Member State
Annual paid (farm) wage	Socioeconomic variable	Euros	January, 2004 - December, 2014		Irregular	Member State
Hourly paid (farm) wage	Socioeconomic variable	Euros	January, 2004 - December, 2014		Irregular	Member State

Annual average (industrial) wage	Socioeconomic variable	Euros	January, 2004 - December, 2014		Irregular	Member State
Hourly average (industrial) wage	Socioeconomic variable	Euros	January, 2004 - December, 2014		Irregular	Member State

# Gridded winter soft wheat phenological database for Europe

## General information

**Description:** The gridded phenological database contains spatial distribution at 25x25 km grid level of four phenological parameters for modelling winter soft wheat phenological development: TSUM1 (growing degree days from emergence to full flowering), TSUM2 (growing degree days from flowering to physiological maturity), SOWING (sowing dates) and VERNSAT (required duration of exposure to vernalizing temperatures). The database was constructed through spatial calibration of winter soft wheat phenology across Europe, on the basis of field phenological observations combined with regional cropping calendars. The base temperature to calculate TSUM1 and TSUM2 is 0 °C. The autumn sowing dates are determined as the first day when the 7-day running long-term-average daily temperature drops below 11 °C. Vernalizing temperatures range between -4 °C and 17 °C, which represent minimum and maximum temperatures for effective vernalization, respectively.

**Producer:** Food Security Unit of the Joint Research Center (JRC.D.5)

**Link:** <https://agri4cast.jrc.ec.europa.eu/DataPortal/Index.aspx>

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:** crop production, Agriculture, fisheries, forestry and food

**Useful for the analysis of:** Crop production, Climate change

**Themes covered:**

**Spatial resolution (in meters):** 25000.0

**Temporal resolution:**

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** GEOREFERENCED

**Characterization last update:** January 14, 2022

**Characterization created at:** January 9, 2022

**Issued:** October 9, 2019

**Last update:** October 9, 2019

**Periodicity:** Irregular

**Temporal extent:** January, 2019 - December, 2019

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
CSV	CSV	Public		CSV	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Area size	Area size unit
Grid	January, 2019 - August, 2019		625	square kilometre

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Saturated vernalization requirements (VERNSAT)	Georeferenced variable		January, 2019 - August, 2019			
Temperature sum from emergence to flowering (TSUM1)	Georeferenced variable	degree	January, 2019 - August, 2019	Sum		
Temperature sum from flowering to physiological maturity (TSUM2)	Georeferenced variable	degree	January, 2019 - August, 2019	Sum		

Sowing day (SOWING)	Georeferenced variable	day	January, 2019 - August, 2019			
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# Daily weather data for crop modelling over Europe derived from climate change scenarios

## General information

**Description:** The resource consists of consolidated and coherent future daily weather data for Europe on a 25x25 km grid designed for crop modelling. The dataset is based on three time horizons (2000, 2020 and 2030), each represented by 30 synthetic years created using the weather generator ClimGen and the statistical distribution of meteorological variables around these time horizons. Some of these meteorological variables are taken directly from dynamically downscaled and bias-corrected regional climate simulations (from the FP6 ENSEMBLES project), while others are collected from historical series or re-estimated based on the former ensuring consistency within daily records. For more detailed information please refer to: Duveiller et al. 2015. A dataset of future daily weather data for crop modelling over Europe derived from climate change scenarios. Theoretical and Applied Climatology.

**Producer:** Food Security Unit of the Joint Research Center (JRC.D.5)

**Link:** <https://agri4cast.jrc.ec.europa.eu/DataPortal/index.aspx?o=d>

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:**

**Useful for the analysis of:**

**Themes covered:**

**Spatial resolution (in meters):** 25000.0

**Temporal resolution:** 2000-2020-2030 (Each represented by 30 synthetic years)

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** GEOREFERENCED

**Characterization last update:** January 14, 2022

**Characterization created at:** January 14, 2022

**Issued:** September 1, 2015

**Last update:**

**Periodicity:** Daily

**Temporal extent:** January, 2000 - December, 2030

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
CSV	CSV	Public		CSV	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Area size	Area size unit
Grid	January, 1970 - December, 2030		625	square kilometre

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Sum of precipitation (mm/day),	Georeferenced variable		January, 2000 - December, 2030		Irregular	
Minimum air temperature (°C),	Georeferenced variable		January, 2000 - December, 2030			
Maximum air temperature (°C)	Georeferenced variable		January, 2000 - December, 2030			
Total global radiation (KJ/m2/day),	Georeferenced variable		January, 2000 - December, 2030			
Reference evapotranspiration (mm/day) FAO56	Georeferenced variable		January, 2000 - December, 2030			
Minimum Relative Air Humidity (%)	Georeferenced variable		January, 2000 - December, 2030			

Maximum Relative Air Humidity (%)	Georeferenced variable		January, 2000 - December, 2030			
Vapour Pressure Deficit (kPa)	Georeferenced variable		January, 2000 - December, 2030			
Mean daily wind speed at 10m (m/s)	Georeferenced variable		January, 2000 - December, 2030			



# Gridded Remote Sensing Data in Europe

## General information

**Description:** Remote Sensing data for vegetation monitoring in Europe. The aggregation procedure considers only pixel with a given threshold of land cover according to Genovese et al. methodology [ 2001 - Agronomie 21, 91–111].

**Producer:** Food Security Unit of the Joint Research Center (JRC.D.5)

**Link:** <https://agri4cast.jrc.ec.europa.eu/DataPortal/Index.aspx?o=>

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:** Agriculture, fisheries, forestry and food

**Useful for the analysis of:** Agriculture policy

**Themes covered:**

**Spatial resolution (in meters):** 25000.0

**Temporal resolution:** TEN-DAILY

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** GEOREFERENCED

**Characterization last update:** January 14, 2022

**Characterization created at:** January 9, 2022

**Issued:** August 16, 2016

**Last update:**

**Periodicity:** Daily

**Temporal extent:** March, 2007 - December, 2016

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
CSV	CSV	Public		CSV	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Area size	Area size unit
Country	March, 2007 - December, 2016		625	square kilometre
Fixed threshold value 0%	March, 2007 - December, 2016		625	square kilometre
Grid	March, 2007 - December, 2016		625	square kilometre
Fixed threshold value 50%	March, 2007 - December, 2016		625	square kilometre
Fixed threshold value 100%	March, 2007 - December, 2016		625	square kilometre

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Mean Pixel Value	Georeferenced variable		March, 2007 - December, 2016	Average		Country
Normalized Difference Vegetation Index	Georeferenced variable		March, 2007 - December, 2016			
Fraction of Absorbed PAR-Radiation	Georeferenced variable		March, 2007 - December, 2016			
Normalized Difference Vegetation	Georeferenced variable		March, 2007 - December, 2016			

Index (Smoothed)						
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# FLINT-Risk managment

## General information

**Description:** This case study looks at the adoption of risk management strategies in european agriculture

**Producer:** FLINT

**Link:** <https://www.flint-fp7.eu/downloads/reports/D5.2a.pdf>

**Languages:** English

**Catalogue:**

**Subjects:** insurance, Business, statistics

**Useful for the analysis of:** Insurance policy

**Themes covered:**

**Spatial resolution (in meters):**

**Temporal resolution:**

**Resource type:**

**Was generated by:** FLINT, FADN, OECD

**Is referenced by:**

**Geographical coverage:** Germany, Spain, Finland, Greece, Hungary, Ireland, Netherlands, Poland

**Dataset type:** SOCIOECONOMIC

**Characterization last update:** January 14, 2022

**Characterization created at:** December 16, 2021

**Issued:**

**Last update:**

**Periodicity:** Annual

**Temporal extent:** January, 2014 - December, 2020

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
PDF	PDF	Public	<a href="https://www.flint-fp7.eu/downloads/reports/D5.2a.pdf">https://www.flint-fp7.eu/downloads/reports/D5.2a.pdf</a>	PDF	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Population coverage	Unit of analysis number
Insurance	January, 2014 - December, 2020	Country		
Adoption of contracts	January, 2014 - December, 2020	Country		

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
No price contract	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Adoption of contracts
Market price contract	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Adoption of contracts
Minimum price contract	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Adoption of contracts
Fixed price contract	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Adoption of contracts
Crop insurance	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Insurance
Livestock insurance	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value	Annual	Insurance
Building insurance	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Insurance
Occupational accident insurance	Socioeconomic variable	Percentage	January, 2014 - December, 2020	Instant value		Insurance

# Gridded Remote Sensing Long Term Average in Europe

## General information

**Description:** Remote Sensing long term average for vegetation monitoring in Europe. The aggregation procedure considers only pixel with a given threshold of land cover according to Genovese et al. methodology [ 2001 - Agronomie 21, 91–111].

**Producer:** Food Security Unit of the Joint Research Center (JRC.D.5)

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

**Languages:** English

**Catalogue:** Agri4Cast

**Subjects:**

**Useful for the analysis of:**

**Themes covered:**

**Spatial resolution (in meters):** 25000.0

**Temporal resolution:** MEAN DAY

**Resource type:**

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Europe

**Dataset type:** GEOREFERENCED

**Characterization last update:** January 14, 2022

**Characterization created at:** January 9, 2022

**Issued:** August 16, 2016

**Last update:**

**Periodicity:** Daily

**Temporal extent:** January, 2015 - December, 2015

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
CSV	CSV	Public		CSV	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Area size	Area size unit
Grid	January, 2015 - December, 2015		625	square kilometre

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
SAMPLE	Georeferenced variable		January, 2015 - December, 2015			
PERCENTAGE	Georeferenced variable		January, 2015 - December, 2015			
FIRST DECILE	Georeferenced variable		January, 2015 - December, 2015			
SECOND DECILE	Georeferenced variable		January, 2015 - December, 2015			
THIRD DECILE	Georeferenced variable		January, 2015 - December, 2015			
FOURTH DECILE	Georeferenced variable		January, 2015 - December, 2015			
FIFTH DECILE	Georeferenced variable		January, 2015 - December, 2015			
SIXTH DECILE	Georeferenced variable		January, 2015 - December, 2015			
SEVENTH DECILE	Georeferenced variable		January, 2015 - December, 2015			

EIGHTH DECILE	Georeferenced variable		January, 2015 - December, 2015			
NINETH DECILE	Georeferenced variable		January, 2015 - December, 2015			
TENTH DECILE	Georeferenced variable		January, 2015 - December, 2015			
MEAN	Georeferenced variable		January, 2015 - December, 2015		Daily	
MINIMUM	Georeferenced variable		January, 2015 - December, 2015			
MAXIMUM	Georeferenced variable		January, 2015 - December, 2015			
STANDART DEVIATION	Georeferenced variable		January, 2015 - December, 2015			



# FLINT - Water footprint

## General information

**Description:** The water footprint of a business (BWF) is defined as the total volume of freshwater that is used directly or indirectly to run and support a business. The water footprint of a business consists of two components: the operational water use (direct water use) and the water use in the supply chain (indirect water use).

**Producer:** FLINT

**Link:** <https://www.flint-fp7.eu/downloads/reports/D5.2o.pdf>

**Languages:** English

**Catalogue:**

**Subjects:** water, Environment

**Useful for the analysis of:** Use of water

**Themes covered:**

**Spatial resolution (in meters):**

**Temporal resolution:**

**Resource type:** Collection

**Was generated by:**

**Is referenced by:**

**Geographical coverage:** Germany, Spain, Finland, Greece, Hungary, Ireland, Netherlands, Poland

**Dataset type:** SOCIOECONOMIC

**Characterization last update:** December 16, 2021

**Characterization created at:** December 16, 2021

**Issued:**

**Last update:**

**Periodicity:** Irregular

**Temporal extent:** January, 2011 - December, 2011

**Keywords:**

## Distributions

Title	Format	Access rights	Access URL	Compress format	Data service
PDF	PDF	Public		PDF	False

## Units of analysis

Name	Temporal extent	Aggregation level unit	Population coverage	Unit of analysis number
Number of farms in the FLINT sample and measurement with water meter	January, 2011 - December, 2011	Country		
Water measurement in the FLINT sample	January, 2011 - December, 2011			
Usage of water in the FLINT sample	January, 2011 - December, 2011			
Irrigation in the FLINT sample: number of farms, UAA and water consumption	January, 2011 - December, 2011	Country		
Irrigation and water meter in the FLINT sample: number of farms	January, 2011 - December, 2011			
Main irrigation system in the FLINT sample	January, 2011 - December, 2011	Country		
Crops	January, 2011 - December, 2011	Country		
Source of water	January, 2011 - December, 2011	Country		

## Variables included

Name	Type	Unit of measurement	Temporal extent	Mathematical representation	Data frequency	Unit of analysis
Number of farms with	Socioeconomic variable	Number	January, 2011 - December, 2011	Instant value	Irregular	Number of farms in the FLINT sample and measurement with water meter

water consumption declared > 0						
Number of farms with water meter	Socioeconomic variable	Number	January, 2011 - December, 2011	Instant value	Irregular	Number of farms in the FLINT sample and measurement with water meter, Irrigation and water meter in the FLINT sample: number of farms
Number of farms with water consumption metered	Socioeconomic variable	Number	January, 2011 - December, 2011	Instant value	Irregular	Number of farms in the FLINT sample and measurement with water meter
Water meter	Socioeconomic variable	m^3	January, 2011 - December, 2011	Instant value	Irregular	Water measurement in the FLINT sample
Estimation	Socioeconomic variable	m^3	January, 2011 - December, 2011	Instant value	Irregular	Water measurement in the FLINT sample
Livestock	Socioeconomic variable	m^3	January, 2011 - December, 2011	Instant value	Irregular	Usage of water in the FLINT sample
Irrigation	Socioeconomic variable	m^3	January, 2011 - December, 2011	Instant value	Irregular	Usage of water in the FLINT sample
Others	Socioeconomic variable	m^3	January, 2011 - December, 2011	Instant value	Irregular	Usage of water in the FLINT sample
Number of farms with total water measured with water meter	Socioeconomic variable	Number	January, 2011 - December, 2011	Instant value	Irregular	Irrigation and water meter in the FLINT sample: number of farms
Surface irrigation	Socioeconomic variable	Number of farms	January, 2011 - December, 2011	Instant value	Annual	Main irrigation system in the FLINT sample
Sprinkler irrigation	Socioeconomic variable	Number of farms	January, 2011 - December, 2011	Instant value	Annual	Main irrigation system in the FLINT sample
Drip irrigation	Socioeconomic variable	Number of farms	January, 2011 - December, 2011	Instant value	Annual	Main irrigation system in the FLINT sample

Other irrigation	Socioeconomic variable	Number of farms	January, 2011 - December, 2011	Instant value	Annual	Main irrigation system in the FLINT sample
Rainfall storage	Socioeconomic variable	percentage	January, 2011 - December, 2011	Instant value	Annual	Source of water
Natural surface courses	Socioeconomic variable	percentage	January, 2011 - December, 2011	Instant value	Annual	Source of water
Artificial surface water courses	Socioeconomic variable	percentage	January, 2011 - December, 2011	Instant value	Annual	Source of water
Groundwater	Socioeconomic variable	percentage	January, 2011 - December, 2011	Instant value	Annual	Source of water
Tap water	Socioeconomic variable	percentage	January, 2011 - December, 2011	Instant value	Annual	Source of water
Other sources of water	Socioeconomic variable	percentage	January, 2011 - December, 2011	Instant value	Annual	Source of water
Cereals (excluding corn and rice)	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Corn	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Protein crops	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Potatoes	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Sugar beet	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Industrial crops	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Oil seed crops	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Fiber plans	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops

Vegetables	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Temporary grass, green maize	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Citrus fruits	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Berries and nuts	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Pasture, meadows, rough grazing	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
fruits (excluding citrus fruits)	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Olives	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Grapes and wine	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops
Other crops	Socioeconomic variable	ha/percentage	January, 2011 - December, 2011	Instant value	Annual	Crops