D4.3: DATA MANAGEMENT PLAN

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DATE: (27 – 06 –2018)

PROJECT	Support for Policy Relevant Modelling of Agriculture (SUPREMA)
PROJECT NUMBER	773499
TYPE OF FUNDING	Coordination and Support Action
DELIVERABLE	D.4.3 Data Management Plan
WP NAME/WP NUMBER	Project coordination and management / WP4
TASK	Task 4.4 (Data management)
VERSION	Final
DISSEMINATION LEVEL	Public
DATE	28/06/2018 (Date of this version) – 30/06/2018 (Due date)
LEAD BENEFICIARY	WR
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INTERNAL REVIEWER	Approval by WP leader

DOCUMENT HISTORY

Version	Initials/NAME	DATE	COMMENTS-DESCRIPTION OF ACTIONS
1	Version 0.1	12/6/2018	First draft shared with consortium, to specify variables from the different models
2	Version 0.2	22/6/2018	Updated version with contribution on DataM and the specific model contributions
3	Version 1.0	27/6/2018	Update of MITERRA-Europe model/Update of DataM presentation/Clean-up version of Figure 2 is included. Information GLOBIOM is updated, and conclusions are added.

Table of Contents

Executive summary

This deliverable presents the Data Management Plan (DMP) on open access data handling by SUPREMA. Here, Open access (OA) refers to the practice of providing on-line access to scientific information that is free of charge to the end-user and reusable. 'Scientific' refers to all academic disciplines. In the context of research & innovation, 'scientific information' can mean: (i) peer-reviewed scientific research articles (published in scholarly journal) or (ii) research data (data underlying publications, curated and raw data) (see also: European Commission, 2017).

For SUPREMA, the DMP is defined as 'the development, execution and supervision of plans, policies, programmes and practices that control, protect, deliver and enhance the value of data and information assets' obtained.

This report describes the management of the research data collected and generated during the project, and after it is completed. This also includes data to be generated, methodologies and standards, data privacy/openness, and preservation measures.

Changes with respect to the DoA

No changes with respect to the DoA

Dissemination and uptake

The deliverable is publicly available. SUPREMA does not necessarily opening up all research data. In a sense, the document explains which of the research data generated and/or collected will be made open.

Short Summary of results

DataM is the European Commission's data portal of agro-economic modelling. It contains the outcomes of research activities, and is operated by the Joint Research Centre (JRC) of the European Commission. DataM, including the web portal but also the Information System, will be used to release model runs that are considered for open access release. A baseline comparison and harmonization action will be addressed for all models represented in SUPREMA. A medium-term (until 2030) assessment of European agricultural policy alternatives will cover CAPRI, IFM-CAP and AGMEMOD-MITERRA Europe. Finally, SUPREMA will also use different modelling tools for the long-term (until 2050) assessment of climate change goals, using GLOBIOM and MAGNET as leading models.

Evidence of accomplishment

The deliverable itself can act as the evidence of accomplishment.

Glossary / Acronyms

AGMEMOD	AGRICULTURE MEMBERSTATES MODELLING
AGMIP	AGRICULTURAL MODEL INTERCOMPARISON AND IMPROVEMENT PROJECT
BI	BUSINESS INTELLIGENCE
CA	CONSORTIUM AGREEMENT
CAPRI	COMMON AGRICULTURAL POLICY REGIONALISED IMPACT MODELLING SYSTEM
CSV	COMMA SEPARATED VALUES
DBA	DATABASE ADMINISTRATOR
DG	DIRECTORATE GENERAL
DG AGRI	DIRECTORATE GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT
DG COMM	DIRECTORATE GENERAL FOR COMMUNICATION
DMP	DATA MANAGEMENT PLAN
EUROCARE	EUROPEAN CENTRE FOR AGRICULTURAL, ENVIRONMENTAL AND REGIONAL RESEARCH
GA	GRANT AGREEMENT
GDP	GROSS DOMESTIC PRODUCT
GLOBIOM	GLOBAL BIOSPHERE MANAGEMENT MODEL
IFM-CAP	INDIVIDUAL FARM MODEL FOR COMMON AGRICULTURAL POLICY
IIASA	INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS
IPR	INTELLECTUAL PROPERTY RIGHTS
JRC	JOINT RESEARCH CENTRE
LCA	LIFE CYCLE ANALYSIS
LULUCF	LAND USE, LAND-USE CHANGE, AND FORESTRY
MAGNET	MODULAR APPLIED GENERAL EQUILIBRIUM TOOL
NUTS	NOMENCLATURE OF TERRITORIAL UNITS FOR STATISTICS
OA	OPEN ACCESS
SUPREMA	SUPPORT FOR POLICY RELEVANT MODELLING OF AGRICULTURE
UAA	UTILIZED AGRICULTURAL AREA
WR	WAGENINGEN RESEARCH

1 Introduction

1.1 Structure of the document

Section 1.2 will outline the need for a Data Management Plan in SUPREMA, and proposes the use of DataM for the release of public datasets that is traceable through the publication of related meta-data in the JRC Data catalogue and in major European open data portals. Section 2 will present the DataM Information System, including the data management tool, and the software used. Moreover, the DataM portal is presented, its governance and architecture, as well as data privacy considerations. Section 3 will summarise the steps for open release of scenarios from CAPRI, GLOBIOM, MAGNET, AGMEMOD, MITERRA-EUROPE and IFM-CAP, including IPR. Main conclusions are presented in Section 4 of the report.

1.2 Why is a Data Management Plan needed?

SUPREMA participates in the Open Access and the Open Research Data Pilot of the European Research Council (ERC). From 2017 all H2020 projects will participate in a pilot project to make the underlying data related to project outputs openly available for use by other researchers, innovative industries and citizens (https://www.openaire.eu/what-is-the-open-research-data-pilot). According to the Open Research Data Pilot, 'Open data is data that is free to access, reuse, repurpose, and redistribute. The Open Research Data Pilot aims to make the research data generated by Horizon 2020 projects accessible with as few restrictions as possible, while at the same time protecting sensitive data from inappropriate access.' (https://www.openaire.eu/what-is-the-open-research-data-pilot). Data will be released in open formats, with proper documentation to support their use in other research. After the project completion, and if there is no objection by any of the project partners and use anonymization is preserved, the data are foreseen to be published in an Open Data portal (for example in http://open-data.europa.eu) for future research.

The DMP specifies the implementation of the pilot for: data generated and collected, standards in use, workflow to make data accessible for use, reuse and verification by the community, and definition of a strategy of curation and preservation of the data. Therefore, we refer to the SUPREMA Grant Agreement (GA), Article 29.3 on "Open Access to research data":

Regarding the digital research data generated in the action ('**data**'), the beneficiaries must:

  a. deposit in a research data repository and take measures to make it possible for third parties to access, mine, exploit, reproduce and disseminate — free of charge for any user — the following:
     – the data, including associated metadata, needed to validate the results presented in scientific publications as soon as possible;
     – other data, including associated metadata, as specified and within the deadlines laid down in the 'data management plan'.
  b. provide information — via the repository — about tools and instruments at the disposal of the beneficiaries and necessary for validating the results (and — where possible — provide the tools and instruments themselves).

This does not change the obligation to protect results in Article 27, the confidentiality obligations in Article 36, the security obligations in Article 37 or the obligations to protect personal data in Article 39, all of which still apply.

As an exception, the beneficiaries do not have to ensure open access to specific parts of their research data if the achievement of the action's main objective, as described in Annex 1, would be jeopardised

by making those specific parts of the research data openly accessible. In this case, the data management plan must contain the reasons for not giving access.

The data management policy described in this document reflects the current state of consortium agreement on data management. Data will be stored in a database developed by JRC (DataM). Project participants will have secured web access to the databases, which will have been automatically checked for consistency, homogeneity and completeness. After project completion, and in case of no objection by project partners, DataM dataset can be open to the public for future research always consistent with exploitation and Intellectual Property Rights (IPR) requirements. DataM public datasets will be made traceable through the publication of related meta-data in the JRC Data catalogue (http://data.jrc.ec.europa.eu) and in major European open data portals (EU open data portal, http://data.europa.eu and European Data Portal, https://www.europeandataportal.eu).
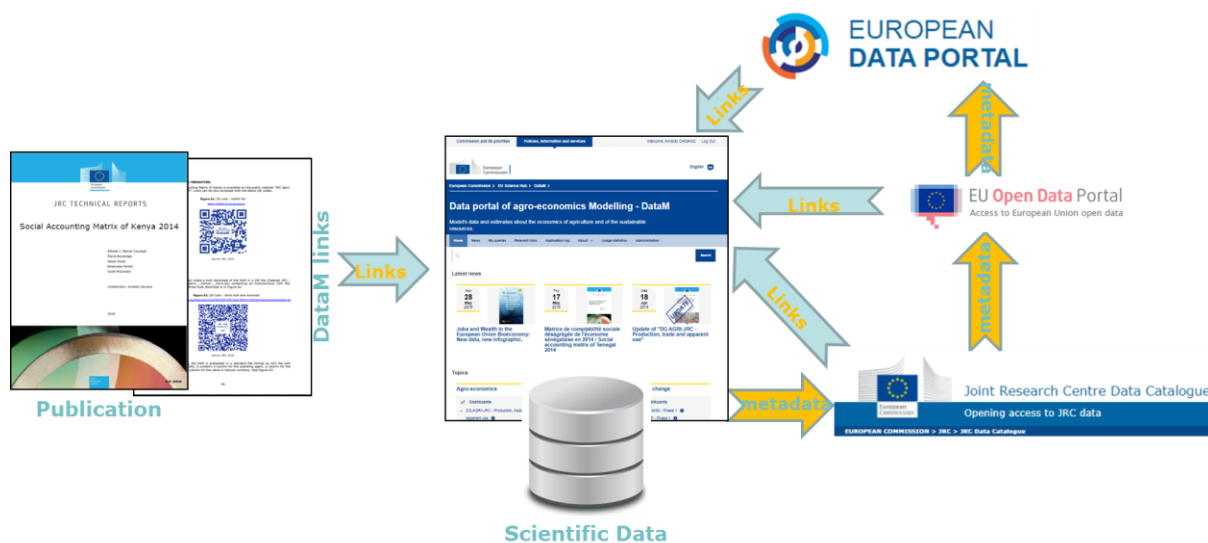
Figure 1 - DataM and open data

2 DataM

DataM is publicly known as a web site (https://datam.jrc.ec.europa.eu): it is the European Commission's data portal of agro-economic modelling. DataM contains model's data and estimates about the economics of agriculture and of the sustainable resources. By definition, DataM does not deal with official statistical data. DataM contents are the outcomes of research activities. Indeed, DataM is operated by JRC, the Joint Research Centre of the European Commission. Data is presented both in terms of raw CSV datasets, ready to download, and in the form of advanced interactive dashboards or interactive infographics that allow the self-analysis of data.

2.1 The DataM Information System

Internally in JRC, and in the context of SUPREMA, the term DataM does not refer only to the web portal but to the Information System in broader terms. The DataM Information System includes also a "data management tool" and a "Business Intelligence tool".

Figure 2 - DataM Information System

2.1.1 Life-cycle of scientific data and DataM

We can consider the life cycle of scientific data as composed by three main phases: construction, analysis and dissemination. The DataM Information System deals principally with the last two.
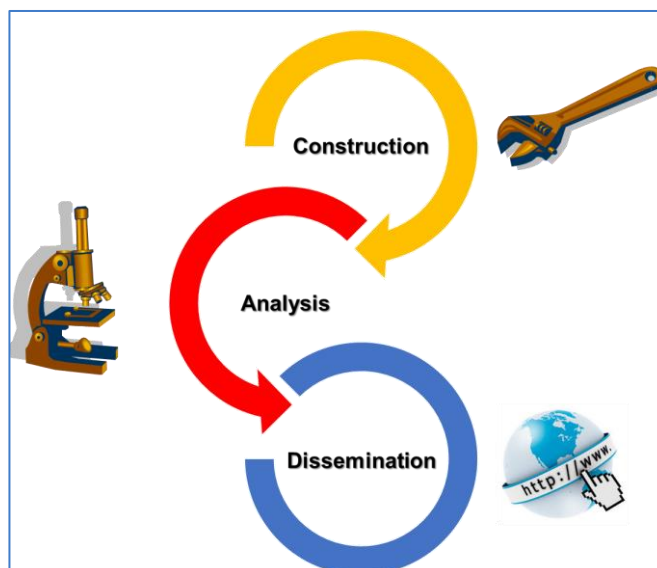

Figure 3 - Life-cycle of data

Actually the processes of strict construction of the data is arbitrary and depends on the individual scientific activities. Typical DataM outcomes are the result of modelling activities (i.e. GAMS software processing). However DataM contains also results of data processing, following a scientific

methodology, over data coming from other sources. The following table (Table 1) lists the origin of DataM contents at time of writing.

#	DataM Content	Raw datasets	Interactive Dashboard	Interactive infographics	Origin
1	AGMIP - Agricultural model intercomparison and improvement project - Phase 1	Yes	Yes	No	Modelling (CAPRI, IMAGE, GLOBIOM, MAGNET, MAgPIE)
2	AGMIP – Food insecurity and global climate change mitigation policy	Yes (coming soon)	No	No	Modelling (AIM, CAPRI, EPPA, ENVISAGE, FARM, GLOBIOM, GCAM, GTEM, IMPACT, MAGPIE, MAGNET)
3	ASGTS_KENYA	No	No	Yes (coming soon)	Modelling (CGE)
4	DG AGRI-JRC - Production, trade and apparent use	Yes	Yes	No	Application of DG AGRI experts' coefficients and DG AGRI/JRC methodolgoy to combine COMEXT data with DG AGRI data (Short Term Outlook)
5	FOODSECURE	No	No	Yes	Modelling (IMAGE, GLOBIOM, MAGNET)
6	FTA	No	No	Yes	Modelling (AGLINK-COSIMO, MAGNET)
7	JRC - AgCLIM50 - Phase 1	Yes	Yes	No	Modelling (CAPRI, IMAGE, GLOBIOM, MAGNET, MAgPIE)
8	JRC - Bioeconomics	Yes	No	Yes	Application of calculations over publicly available data (mainly EUROSTAT COMEXT) as from JRC methodology based on coefficients provided by NOVA institute
9	JRC - Biomass estimates	Yes	No	No	Application of calculations over publicly available data (mainly FAO Prodstat) as from JRC/NOVA methodology
10	JRC - Biomass uses and flows	Yes (coming soon)	Yes	No	Complex integration of multi-source data following a JRC methodology
11	JRC - BioSAMs for the EU Member States - 2010	Yes	Yes	No	Elaboration of the SAM by CGE team at JRC-Economics of agriculture department
12	JRC - Matrice de comptabilité sociale - Kenya - 2014	Yes	Yes	No	Elaboration of the SAM by CGE team at JRC-Economics of agriculture department
13	JRC - Matrice de comptabilité sociale - Sénégal - 2014	Yes	Yes	No	Elaboration of the SAM by CGE team at JRC-Economics of agriculture department
14	JRC - Social accounting matrix - Kenya - 2014	Yes	Yes	No	Elaboration of the SAM by CGE team at JRC-Economics of agriculture department
15	JRC - Social accounting matrix - Senegal - 2014	Yes	Yes	No	Elaboration of the SAM by CGE team at JRC-Economics of agriculture department
16	SCENAR2030	Yes	Yes	Yes	Modelling (CAPRI, IFM-CAP, MAGNET)
17	DEVELOPING COUNTRIES' FICHES	No	No	Yes (coming soon)	Integration of data of various sources

Table 1 - DataM contents (June 2018)

For those contents whose source is not modelling, data construction is based on ad-hoc techniques. In these cases, the typical technologies in use are: (i) the python language (data extraction from file or web sources, and data crunching); and (ii) database tools such as Oracle and SQL-lite (data crunching in SQL or PL/SQL).

DataM Information System is used for the final integration of data into consolidated datasets, and for the post-construction part. DataM can have also an impact in the construction phase since DataM datasets can work as input for further elaborations.

2.1.2 The DataM data management tool

With "data management tool" we mean a software layer above the data base management system that factorizes common needs for the management of (scientific) datasets.
The DataM data management tool allows:
- loading data from external sources.
- storing data in standard format (time-series oriented star-diagram with one unique measure and arbitrary dimensions; time and "indicator" are mandatory dimensions)
- avoiding "data manipulation" operations (Creating, modifying, dropping tables and indexes) / no need of DBA support
- managing dictionaries of common reference data
- allowing harmonization of data by:
    o mapping different nomenclatures
    o converting units of measurement
    o aligning different granularities
    o aligning different taxonomies
- Managing data versioning
- Managing standard meta data for all contents
    o Description

- o Contact point
- o Geographical coverage[1]
- o Time coverage
- o Copyright
- o Update frequency
- o Domain
- o Keyword (tags for search operations in open data portals)
- o Contributors:
  - ▪ Name, Surname
  - ▪ Email
  - ▪ ORCID
- o Distributions:
  - ▪ Link for bulk download of raw data
  - ▪ Link for interactive data download
  - ▪ Link to interactive dashboard or infographic
- o Related publications / methodology documents
  - ▪ Title
  - ▪ Authors
  - ▪ DOI

Data management tool: managing, harmonizing and sharing datasets

(relational) data base management system: general-purpose, structured, data storage

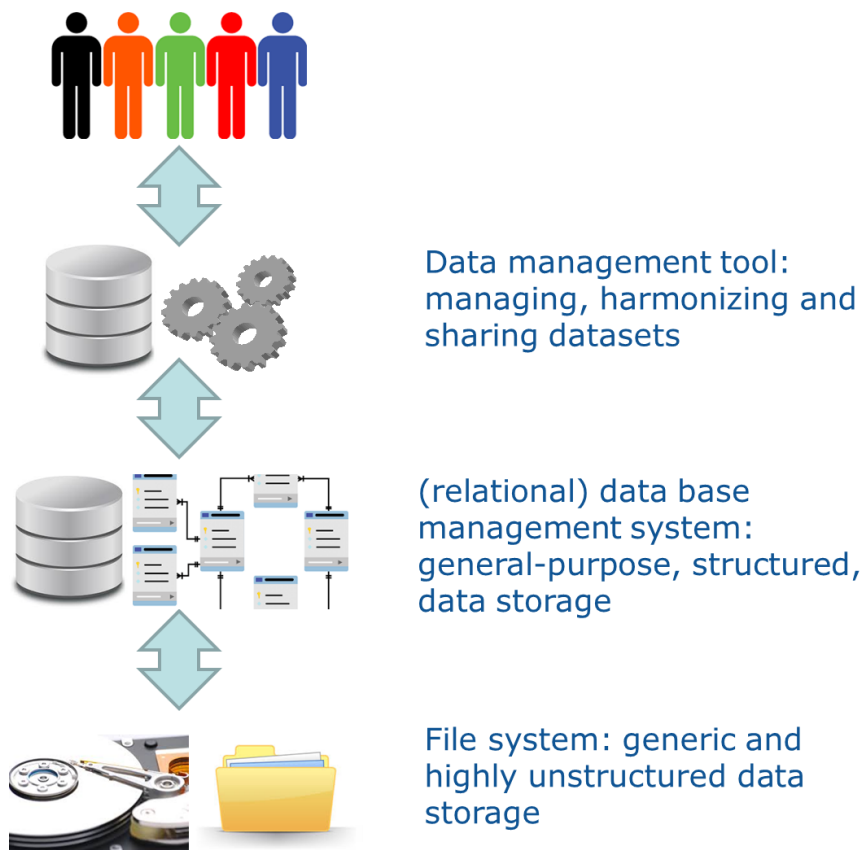File system: generic and highly unstructured data storage

Figure 4 - Data management tool

The data management tool of DataM is inspired to the time-series-oriented, reference data dictionaries and star-diagram data structures managed by the formerly used "PROGNOZ platform"

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[1] In DataM the time coverage and geographical coverage are automatically calculated on the basis of the data every night.

software (principles that are common to most data warehouse technologies), while integrating the advanced management of standard meta-data.

The current data management tool of DataM does not include features for:
- Extracting data from arbitrary sources and transforming it in a structure suitable for the load in the database. Python routines are developed at this purpose.
- Workflow management for the collaborative construction of datasets by distributed working groups.
- Management of big data
- Management of geo-spatial data
- Management of arbitrary data structures that do not fit into a star-diagram
- Management of multilingualism

2.1.3 The DataM BI tool: Qlik-Sense

Qlik-Sense is a modern software for business intelligence (BI). It is considered one of the top leaders on the BI market.[2] In use in many Directorate General, is a standard de-facto in the European Commission. Business intelligence (BI) comprises the strategies and technologies used by enterprises for the data analysis of business information. BI technologies provide historical, current and predictive views of business operations. Common functions of business intelligence technologies include reporting, online analytical processing, analytics, data mining, process mining, complex event processing, business performance management, benchmarking, text mining, predictive analytics and prescriptive analytics.

JRC is adopting the BI for scientific purposes, in particular, in DataM BI is used for:

- Analysing the constructed datasets:

  o Comparison with other sources
  o Outliers detection
  o Check of the respect of "business rules"

- Exchanging results in proper way within the scientific circuit or with other stake-holders (i.e.: policy DG's)
- Disseminating results on the web allowing user to make self-analysis of data:

  o interactive dashboards = dashboards with interrelated charts/tables/maps with scarce or absent narrative
  o Interactive infographics = web pages with much narrative and embedded Qlik contents.

2.1.4 The DataM portal

The DataM portal (https://datam.jrc.ec.europa.eu) is an official part of the European Commission web presence[3]; it has been recently approved by DG COMM and refactored following EC web standards and is inspired to the principles of the knowledge-for-policy platform[4] being developed by JRC. It offers the following functionalities:

- Search contents by specifying keywords

- – Download of raw data:
    - o Bulk download, zip file with CSV with data, citation text, legal notice and all metadata
    - o Interactive data download by filtering the parts of interest of the dataset
    - o Obtaining automatically the citation text, for correctly citing the dataset in scientific publications
    - o Visualizing the meta-data
    - o Visualizing the copyright notice
    - o Accessing the related publications / methodology documents
- – Accessing the Qlik interactive dashboards and infographics
- – API for automatic synchronization of the meta-data with the JRC data catalogue (and subsequent dissemination to EU open data portal and European Data Portal).
- – API for transmitting data on-demand to other computer systems

2.1.5 DataM governance

At time of writing, DataM is developed and managed by a team of four IT professionals / data scientists working under the JRC department for Economics of Agriculture within the directorate for Sustainable Resources. It is powered by JRC IT, in particular by the staff (and on machines) of the JRC Seville site.

2.1.6 Architecture of the data base

The data base of DataM underlying the data management tool is implemented in Oracle. Each dataset is basically implemented in 2 tables, one table where each record identifies a time-series, and a table where each record is a data-point (time-series identifier, time key, value). Reference data is organized in specific tables.

The strength of this model is the plasticity: it suits to host almost all typical datasets of our domain with a simple, common, structure.

2.1.7 2018 plan for DataM

Activities on DataM in 2018 will focus on:
- – Implementation of a Qlik-based system for the data quality check of model outcomes. At time of writing, works are in progress for the check of CAPRI outcomes
- – Implementation of a data connector for the direct integration of GAMS and Qlik (GAMS2QLIK project, in progress)
- – Refactoring of the data management tool (not in progress, the project is under inception and could encompass 2018 and 2019)

2.1.8 Data privacy

DataM is mainly thought for public dissemination of open data, which means that most of functionalities do not require a login. However, by logging in, authorised users can access restricted contents that require specific access rights. Restrictions normally apply to contents still under study, and this can be the case for the SUPREMA project: contents under preparation can be shared within the SUPREMA community by accessing the restricted area of DataM.

The username and password are obtained through the European Commission's user authentication service (EU Login).

For other users, an EU Login account can be obtained through a simple registration procedure:

Click on "Log In" on the top-right corner of the screen
Click on "Create an account" and follow the instructions.

3 Open access release of scenarios

3.1 List of variables by model

A list of variables is defined for each of the models that are considered for open access release. A baseline comparison and harmonization action will be addressed for all models represented in SUPREMA (Task 3.1 – Inter-model baseline comparison and harmonization). In addition, a medium-term (until 203) assessment of European agricultural policy alternatives will cover CAPRI, IFM-CAP, and AGMEMOD-MITERRA Europe (Task 3.2 – Using SUPREMA for a medium-term assessment of European agricultural policy alternatives). Finally SUPREMA will also use the different modelling tools for the long-term (until 2050) assessment of climate change goals (Task 3.3), using GLOBIOM and MAGNET as leading models. All scenarios are available in Month 28 of the project, and will be released open access soon afterwards.

3.1.1 CAPRI (Common Agricultural Policy Regionalised Impact Modelling System)

The CAPRI database and scenario output covers a multitude of very diverse variables that may be grouped in various ways. Table 1 indicates three major groups:

1) Key physical technological information covers production related, input related, market balance related variables in shades of brown
2) Economic variables are various prices, price elements and values (price times quantities) in shades of blue
3) Derived indicators for the environment and food security in shades of green.

Some of these will be available from other modelling systems as well and therefore of interest for the wider research community and presentation in Data-M. Other parts of the CAPRI database and model output are only useful for CAPRI experts as they require a thorough understanding of CAPRI accounting rules and definitions. While the CAPRI database and also SUPREMA model outputs will be fully available for download upon request from the CAPRI versioning system, any obligation to provide technical explanations and advice on the detailed information cannot be accepted but interested individuals are invited to attend the CAPRI training sessions where such technical information is provided to the attendants. In the process of filling the database for presentation via Data-M it will be decided which variables are presented there and should be displayed in an transparent manner.

Table 1. Main Elements of the CAPRI database and scenario output

	Activities (only EU)	LULUCF (only EU)	Nutrient balances (only EU)	Farm- and market balances	Area use and yields	GHG component	Prices and tariffs	Value information
Outputs	Output coefficients			Production, seed and feed use, other internal use, losses, stock changes, total and bilateral exports and imports, human consumption, processing, TRQs	Crop areas and yields by product	GHG effects per product	Unit value prices from the EAA with and without subsidies and taxes, tariffs applied and bindings	Value of outputs with or without subsidies and taxes linked to production, consumer expenditure, contributions of products to welfare indicators, PSE components, premiums per product
Inputs and mitigation technologies	Input coefficients and implementation shares		Balance components by NPK	Purchases, internal deliveries			Unit value prices from the EAA with and without subsidies and taxes	Value of inputs with or without subsidies and taxes link to input use
GHG components	GHG effects per activity	GHG effects per area type		Total GHG effects from activities				
Human nutrients				Nutrient consumption per capita				
Income indicators	Revenues, costs, Gross Value Added, premiums							Total revenues, costs, gross value added, subsidies, taxes, premium ceilings and ceiling use, PSE and welfare components
Activity levels and totals	Hectares, slaughtered heads or herd sizes	Hectares			Total agricultural area	Total GHG effects from products		
Secondary products				Marketable production, losses, stock changes, exports and imports, human consumption, processing			Consumer prices, market prices, import prices	consumer expenditure, contributions of products to welfare indicators,

3.1.2 GLOBIOM (Global Biosphere Management Model)

GLOBIOM could provide the standard AgMIP (Agricultural Model Intercomparison and Improvement Project) reporting used also by some other models (e.g. CAPRI, MAGNET), which covers a comprehensive set of economic and environmental indicators. In addition, GLOBIOM can also provide more detailed reporting for specific topics of interest i.e. biomass use & climate change mitigation. An overview of the main elements of the GLOBIOM database and scenario output is presented in Tables below.

Table 3. Main Elements of the GLOBIOM database and scenario output

	Activities	Nutrient balances	Market balances	Area use and yields	GHG sector	Prices and tariffs	Value information
Outputs	Outputs for agriculture and forestry related activities	Fertilizer use	Production, feed use, other uses, human consumption, processing, exports and imports for agriculture and forestry	Land use and land use change, crop areas, pasture, productivities	GHG effects for CH4, N2O, and CO2 emissions from AFOLU	Unit value prices	Value of outputs linked to production, contributions of products to welfare indicators,
Inputs	Input coefficients for different activities	Nitrogen balance components		Land cover information, crop areas and yields	Emission factors	Macro-economic drivers (population, GDP, technological change), carbon prices	
GHG components	GHG effects per activity	Synthetic fertilizer use, manure applied and dropped to soils	GHG emissions associated to agricultural and forestry production	Deforestation and other land use changes, dedicated energy plantations	GHG emissions associated to crop- and livestock, forestry and land use changes		
Human nutrients	Consumption per capita by product		Total human consumption, consumption per capita				
Income indicators	Value of outputs linked to production, contributions of products to welfare indicators						Value of outputs linked to production, contributions of products to welfare indicators

GLOBIOM will propose using the AgMIP reporting template, which has been used for model comparison in the past. So, it is a format in which all models need to deliver output data.

Indicator	Variable	Description	Unit
Economic	POPT	Total population	million
	GDPT	Total GDP (MER)	bn USD
	XPRP	Producer price/input price	USD/t
	CONS	Domestic use	1000 t
	FOOD	Food use	1000 t
	FEED	Feed use	1000 t
	OTHU	Other use	1000 t
	NETT	Net trade	1000 t
	IMPO	Imports	1000 t
	EXPO	Exports	1000 t
	CALO	p.c. calorie availability	kcal/cap/d
Production	PROD	Production	1000 t
	AREA	Area harvested	1000 ha
	YEXO	Exogenous crop yield	t/ha
	LYXO	Exogenous livestock yield trend	kg prt/ha

	YILD	Crop yield	t/ha
	LYLD	Livestock yield (endogenous)	kg prt/ha
Environment	LAND	Land cover information (cropland, grassland, forestry, other natural vegetation)	1000 ha
	EMIS	Total GHG emissions from AFOLU	MtCO2e
	ECO2	Total CO2 emissions from land use changes	MtCO2e
	ECH4	Total CH4 emissions from crop- and livestock production	MtCO2e
	EN2O	Total N2O emissions from crop- and livestock production	MtCO2e
	FRTN	Fertiliser N	1000 t
	WATR	Water for irrigation	km3

3.1.3 MAGNET (Modular Applied General Equilibrium Tool)

MAGNET will propose using the AgMIP reporting template, which has been used for model comparison in the past. So, it is a format in which all models need to deliver output data. MAGNET projection periods include: 2011-2020; 2020-2030; 2030-2040; and 2040-2050.

Reporting sectors

Code	Description
RIC	Rice (paddy equivalent)
WHT	Wheat
CGR	Other cereal grains
OSD	Oilseeds (raw equivalent)
SGC	Sugar crops (raw equivalent)
VFN	Vegetables, fruits, nuts (incl. roots and tubers)
PFB	Plant based fibres
ECP	Energy crops
OCR	Other crops
RUM	Ruminant meats
NRM	Non ruminant meats
DRY	Dairy (raw milk equivalent)
OAP	Other animal products (wool, honey)
GRS	Grass
OFD	Other feed products
FSH	Fish
FOR	Forestry products

Sectors subcategories (same variables as parents)

Code	Description
VFN|VEG	Vegetables
VFN|FRU	Fruits
VFN|NUT	Nuts
NRM|PRK	Pork meat
NRM|PTM	Poultry meat
NRM|EGG	Poultry eggs

	NRM|ONR	Other non-ruminant
Sectors aggregates		
	CRP	All crops
	LSP	Livestock products
	AGR	All agricultural products
	TOT	Total (full economy, population, GDP, calories)

LAND variable items		
	CRP	Cropland (including energy crops)
	GRS	Grassland
	ONV	Other natural land
	FOR	Managed and primary forest
	NLD	Non arable land (desert, built-up areas…)
LAND aggregates/subitems		
	AGR	Cropland + grassland
	ECP	Energy crops (included in cropland)
Production factors and intermediates		
	LAB	Labor
	CAP	Capital
	FRT	Fertiliser
	OIL	Fossil fuel
GHG emissions sources		
	ENT	Enteric Fermentation
	MMG	Manure Management
	RCC	Rice Cultivation
	SFR	Synthetic Fertilizers
	MAS	Manure applied to Soils
	MGR	Manure left on Pasture
	CRS	Crop Residues
	ORS	Cultivation of Organic Soils
	BSV	Burning - Savanna
	BCR	Burning - Crop Residues
GHG mitigation technologies		
	LAD	Livestock anaerobic digesters
	LFS	Livestock feed supplements
	LOT	Livestock other
	CFT	Crop improved fertilization
	CMG	Improved cropping management
	RMG	Crop improved rice cultivation
	COT	Crop other

3.1.4 AGMEMOD (Agriculture Memberstates Modelling)

Economic indicators

- – real GDP (index)

- production costs (€/ha; €/kg)
- returns (€/ha)
- prices (€/100 kg)
- yields/crop (ton/ha)
- yields/animal (kg/animal)
- production (1,000 ton)
- food use (1,000 ton)
- feed use (1,000 ton)
- seed use (1,000 ton)
- consumption/capita (kg/head)
- industrial use (1,000 ton)
- exports (1,000 ton)
- imports (1,000 ton)
- area harvested (ha)
- self-sufficiency rate (ratio)
- net trade (1,000 ton)

Social indicators

- population (million inhabitants)

Resources/inputs

- land (ha)
- herd size (animals)

Policy support

- budgetary enveloppes/ceilings (1,000 €)
- coupled payments (1,000 €)
- support reaction price (€/kg)

3.1.5 MITERRA-Europe

MITERRA-Europe, an environmental impact assessment model for agriculture, will provide results on a range of environmental indicators, including:

- Greenhouse gas emissions (CO_2, N_2O and CH_4)
- Changes in soil organic carbon
- NH_3 emissions
- Nutrient balances (N and P)
- Nitrogen leaching and runoff
- NO_3 concentration groundwater
- Critical load exceedance
- Soil erosion
- Soil metal balances (Cadmium, Chrome, Copper, Zinc, Lead and Nickel)
- (maybe a land use based biodiversity indicator)

These results will be made available at country and regional (NUTS2 level) and will be expressed per ha UAA, as well as total for the region or country. In addition, the greenhouse gas emissions, and Nitrogen indicators can also be provided per agricultural product, based on an LCA (life cycle analysis) approach.

In respect to the new EU climate policies, the GHG results will also be presented per sector (Agriculture and LULUCF) at national level following the accounting rules.

Regarding Open Access, all resulting output indicators as used for baseline and scenario tasks, will be provided as Open Access. Almost all of the input data is derived from public data sources and can be considered therefore as Open Access. The model itself is, is not open access, as it is a research model and lacks the proper user interface and manuals to be used by others.

3.1.6 IFM-CAP (Individual Farm Model for Common Agricultural Policy)

The following variables are available for IFM-CAP but only at regional/MS/EU and farm type levels. Individual data cannot be made public:

Agronomic/structural indicators:

- Land allocation/crop area (ha)
- Herd size/animal number (heads)
- Livestock density (LU/ha)
- Share of arable land in Utilized Agricultural Area
- Share of grassland in Utilized Agricultural Area
- Land use change (ha)
- Agricultural production (Tons)
- Intermediate Input use (Tons)

Economic indicators:

- Agricultural output (€)
- CAP first pillar subsidies (€)
- CAP second pillar subsidies (€)
- Intermediate input costs (€)
- Variable costs (€)
- Total costs (€)
- Gross farm income (€)
- Net Farm Income (€)

Environmental indicators:

- Biodiversity index (index)
- Soil erosion (tonnes)

3.2 Intellectual Property Rights (IPR)

Intellectual Property Rights (IPR) will receive special attention from the beginning. All rules regarding management of knowledge and IPR will be governed by the Consortium Agreement (CA). SUPREMA was based on DESCA (Consortium Agreement Model) H2020 model for the Consortium Agreement (CA). SUPREMA will adhere to the rules laid down in Annex II of the Grant Agreement. The CA will address background and foreground knowledge, ownership, protected third party components of the products, and protection, use and dissemination of results and access rights.

The following principles will be applied:

- Pre-existing know how: Each Contractor is and remains the sole owner of its IPR over its pre-existing know-how. The Contractors will identify and list the pre-existing know-how

over which they may grant access rights for the project. The Contractors agree that the access rights to the pre-existing know-how needed for carrying out their own work under the project shall be granted on a royalty-free basis.

- Ownership and protection of knowledge: The ownership of the knowledge developed within the project will be governed by an open source license.
- Open data: Data and results obtained during the project that are based on open public-sector data will be made available free of charge.

The procedures for the dissemination, protection and exploitation of intellectual property rights (IPR) are clearly covered in the Consortium Agreement (in Section 6: Governance Structure, Sub-section 6.2.4: Veto rights). The intention has been to balance the requirements necessary to protect such intellectual property and the foreseen dissemination objectives. IPR will be applied according to the rules of the employer under the applicable European and national laws and regulations.

4 Conclusions

The AGMIP reporting template has been accepted as a base for the economic models and will ensure some minimal comparability of information provided across the economic models. The current deliverable is a "plan", therefore it may be expected that the process initiated with the data comparisons and presentation of selected data by the SUPREMA models will trigger some further harmonisation and standardisation that will go beyond the AGMIP template.

DataM is the European Commission's data portal of agro-economic modelling. It contains the outcomes of research activities, and is operated by the Joint Research Centre (JRC) of the European Commission. DataM, including the web portal but also the Information System, will be used to release model runs that are considered for open access release. A baseline comparison and harmonization action will be addressed for all models represented in SUPREMA. A medium-term (until 2030) assessment of European agricultural policy alternatives will cover CAPRI, IFM-CAP and AGMEMOD-MITERRA Europe. Finally, SUPREMA will also use different modelling tools for the long-term (until 2050) assessment of climate change goals, using GLOBIOM and MAGNET as leading models.

5 References

European Commission (2017). Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in H2020. European Commission, Directorate-General for Research & Innovation.
http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf