CMEF 2014-2020 - Context indicators[1] (update January 2023)

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	Socio-economic indicators
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C.03	Territory
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[1] COMMISSION IMPLEMENTING REGULATION (EU) No 834/2014 of 22 July 2014 laying down rules for the application of the common monitoring and evaluation framework of the common agricultural policy and COMMISSION IMPLEMENTING REGULATION (EU) No 808/2014 of 17 July 2014 laying down rules for the application of Regulation (EU) No 1305/2013 of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).

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C.34	Natura 2000 areas
C.35	Farmland birds index (FBI) (*)
C.36	Conservation status of agricultural habitats (grassland)
C.37	HNV (high nature value) farming (*)
C.38	Protected forest
C.39	Water abstraction in agriculture (*)
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C.41	Soil organic carbon in arable land (*)
C.42	Soil erosion by water (*)
C.43	Production of renewable energy from agriculture and forestry
C.44	Energy use in agriculture, forestry and food industry
C.45	Emissions from agriculture (*)
C.47	Limiting antimicrobials use in farmed animals: Sales/use of antimicrobials in food producing animals
C.48	Sustainable and reduced use of pesticides: Risk, use and impacts of pesticides

Context indicators which incorporate CAP impact indicators are marked with an asterisk (*).

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[2] According to the COMMISSION IMPLEMENTING REGULATION (EU) No 808/2014 this indicator is called "Less-favoured areas"

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Indicator Name	*Title of the indicator used in the commission implementing regulation/guidance documents*
Type of indicator	*Socio-economic / sectorial / environmental indicator*
Definition	*Concise definition of the concept, including if the indicator already exists, e.g. Agri-environmental indicator (AEI), EUROSTAT indicator. If appropriate, include the methodology/formula for establishment of the indicator*
Unit of measurement	*Unit used to record the value (e.g. ha, tonnes, €, %)*
Methodology/formula	*Identification of what is needed to transform data from the operation database into value for the indicator*
Data source	*Identification of existing data sources (e.g. EUROSTAT identifying relevant data set, Farm Accountancy Data Network (FADN), European Environmental Agency, etc.)*
References/location of the data	*Links (other references) to data sources (e.g. in EUROSTAT specifying exact tables, FAO, World bank) AEI definitions, regulations establishing indicators, etc.*
Data collection level	*Identification of the geographical level at which the data is available and at which level the indicator should be established*
Frequency	*Frequency at which the indicator is collected/calculated*
Delay	*How old are the data when they become available*
Comments/caveats	*Comments concerning interpretation of the indicator for monitoring and evaluation purposes and its caveats, if appropriate*

INDICATOR C.01	
Indicator Name	**Population**
Type of indicator	**Socio-economic**
Definition	This indicator refers to the **population on 1st of January of any given year** and consists of 2 sub-indicators: 1. **total population** 2. **population by type of region** (predominantly rural, intermediate and predominantly urban) and **by degree of urbanisation**
Unit of measurement	1: number of persons (in thousands) (where 'persons' comply with the 'usually resident population' concept as defined in EU Regulation 1260/2013 on European demographic statistics) 2: share of total population
Data source	Eurostat – Demography and migration Eurostat – Demography statistics by other typologies
References/ location of the data	National data: tables Population change - Demographic balance and crude rates at national level [demo_gind] National data, by typology: table Demographic balance and crude rates by other typologies [urt_gind3] Regional data: tables Population change - Demographic balance and crude rates at regional level (NUTS 3) [demo_r_gind3]
Data collection level	EU, National (NUTS 0) and demographic data at regional level (NUTS 3) which are used to compute population by regional typology (predominantly rural, intermediate and predominantly urban)
Frequency	Annual
Delay	1 year
Comments/caveats	The distribution of population by type of region has been calculated using the Commission's urban-rural typology, which classifies NUTS 3 regions into predominantly rural, intermediate and predominantly urban. Some Member States have only some types of areas, or data for some areas: - MT – only predominantly urban area, - CY and LU – only intermediate area, - SI – only predominantly rural and intermediate area. The distribution of population by degree of urbanisation is based on 2011 population grid, LAU 2018 delineation.

INDICATOR C.02	
Indicator Name	**Age structure**
Type of indicator	**Socio-economic**
Definition	This indicator refers to the age structure of the EU population **on 1st of January of any given year.** It consists of 2 sub-indicators: 1. **total population by broad age groups** (less than 15 years / from 15 to 64 years / 65 years or over) 2. **population by broad age groups** (less than 15 years / from 15 to 64 years / 65 years or over) **in predominantly rural regions**.
Unit of measurement	1 - 2: Share of total population
Data source	Eurostat - Demography and migration Eurostat - Demography statistics by other typologies
References/ location of the data	National data: table Population on 1 January by broad age group and sex [demo_pjanbroad] National data, by typology: table Population by sex and age groups on 1 January [urt_pjanaggr3] Regional data: table Population on 1 January by broad age group, sex and NUTS 3 region [demo_r_pjanaggr3] Alternatively, there is more detailed data age structure of the population by NUTS 3 regions starting with the year 2014: data by 5-year age group are available in the table [demo_r_pjangrp3].
Data collection level	EU, National (NUTS 0), Regional (NUTS 1, 2 and 3) by type of region (predominantly rural, intermediate and predominantly urban)
Frequency	Annual
Delay	1 year
Comments/caveats	The age structure by type of region has been calculated using the Commission's urban-rural typology, which classifies NUTS 3 regions into predominantly rural, intermediate and predominantly urban.

INDICATOR C.03	
Indicator Name	**Territory**
Type of indicator	**Socio-economic**
Definition	This indicator refers to the total area, with 2 sub-indicators: 1. **total area** (including inland waters) 2. **share of total area by type of region** (predominantly rural, intermediate and predominantly urban) and **by degree of urbanisation.**
Unit of measurement	1: km^2 2: share of total area
Data source	Eurostat - Demography and migration Eurostat - Demography statistics by other typologies
References/ location of the data	National data: total area figures from table Area by NUTS 3 region [reg_area3] National data, by typology: table Area of the regions by other typologies [urt_d3area] Regional data: Area by NUTS 3 region [reg_area3]
Data collection level	EU, National (NUTS 0) and Regional (NUTS 1, 2 and 3)
Frequency	Annual
Delay	1 year
Comments/caveats	In case of missing data, land area has to be used instead of total area. The distribution of population by degree of urbanisation is based on 2011 population grid, LAU 2018 delineation. Data for Cyprus refer to the government-controlled area.

INDICATOR C.04	
Indicator Name	**Population density**
Type of indicator	**Socio-economic**
Definition	This indicator is calculated as the **annual average population** divided by the **land area** and refers to the number of inhabitants per km^2. It consists of 2 sub-indicators: 1. **total population density** 2. **population density in predominantly rural areas**
Unit of measurement	1 – 2: Inhabitants/km^2
Data source	Eurostat – Demography and migration Eurostat – Demography statistics by other typologies
References/ location of the data	National and regional data: table Population density by NUTS 3 region [demo_r_d3dens] National data, by typology: table Population density by other typologies [urt_d3dens]
Data collection level	EU, National (NUTS 0), Regional (NUTS 1, 2 and 3) by type of region (predominantly rural, intermediate and predominantly urban)
Frequency	Annual
Delay	1 year
Comments/caveats	The distribution of population by type of region has been calculated using the Commission's urban-rural typology, which classifies NUTS 3 regions into predominantly rural, intermediate and predominantly urban. Total area (including inland waters) is used when land area is not available. All tables at regional level include data at national level. Starting with the year 2016, the population density included in the table [demo_r_d3dens] is computed using the area data included in the table [reg_area3]. Regional data by type of region calculated as demo_r_gind3 (average population) / demo_r_d3area and classified according to the Commission's urban-rural typology. Most recent urban-rural typology: https://ec.europa.eu/eurostat/web/rural-development/methodology

INDICATOR C.05	
Indicator Name	**Employment rate**
Type of indicator	**Socio-economic**
Definition	**Employed persons aged 15-64 years and 20-64 years[3] as a share of the total population of the same age group in rural areas**: Employed persons are all persons aged 15-64 (or 20-64) years and over who, during the reference week, worked at least one hour for pay or profit or were temporarily absent from such work. Employed persons comprise employees, self-employed and unpaid family workers. Population covers persons aged 15-64 (or 20-64) years and over living in private households. This comprises all persons living in the households surveyed during the reference week. This definition also includes persons absent from the households for short periods (but having retained a link with the private household) owing to studies, holidays, illness, business trips, etc. Persons on compulsory military service are not included. There are 3 sub-indicators: 1. **total employment rate by age groups** 2. **rate by sex and by age groups** 3. **rate by age groups in rural areas** **Methodology**: Based on the Labour Force Survey (LFS), the total employment rate of each country can be disaggregated by degree of urbanisation. This degree of urbanisation classifies the territory (Local Administrative Units (LAU)) into rural areas, towns and suburbs and cities. The rural employment rate of each Member State could then be compared with the employment rates in the other two types of areas or with the employment rate for the whole country. Additionally, employment rates could also be calculated for men and women and even for other age groups.
Unit of measurement	1 – 2 – 3: share of total population of the same age group
Data source	Eurostat – Labour Force Survey
References/location of the data	National data: table Employment rates by sex, age and degree of urbanisation (%) [lfst_r_ergau] Regional data: table Employment rates by sex, age and NUTS 2 regions (%) [lfst_r_lfe2emprt]
Data collection level	LFS data are collected at LAU level (LAU2), with a sample defined to be significant at NUTS 2 level and at national level. By degree of urbanisation (rural areas, towns and suburbs, cities)
Frequency	LFS data are collected on a continuous basis and quarterly/annual results are produced. Data by degree of urbanisation are disseminated by Eurostat annually
Delay	4 months
Comments/caveats	

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[3] In the programming period 2007-2013, the employment rate was calculated for the age group of 15-64 years. In the Europe 2020 strategy, reaching an employment rate of 75% of the population aged 20-64 years is one of the five headline targets to be achieved; however, in rural areas the employment of people below 20 is also an important indicator. Thus it is proposed to keep both age groups, which is also Eurostat's approach.

INDICATOR C.06	
Indicator Name	**Self-employment rate**
Type of indicator	**Socio-economic**
Definition	This indicator refers to the **share of self-employed persons in total employed persons for the age class 15-64 years.** It is calculated by dividing the number of self-employed persons by the number of employed persons of a certain Member State/region.
Unit of measurement	% of self-employed persons aged 15-64 years in total employed persons of the same age class.
Data source	**Eurostat – Labour Force Survey**
References/ location of the data	National data: table Employment by sex, age and professional status [lfsa_egaps] (DG AGRI calculation) Regional data: table Employment by age, professional status and NUTS 2 regions [lfst_r_lfe2estat] (DG AGRI calculation)
Data collection level	LFS data are collected at LAU level (LAU2), with a sample defined to be significant at NUTS 2 level and at national level.
Frequency	Annual
Delay	1 year
Comments/caveats	Regional data are available at NUTS 2 level.

INDICATOR C.07	
Indicator Name	**Unemployment rate**
Type of indicator	**Socio-economic**
Definition	This indicator provides the number of unemployed persons aged 15-24 years **(youth unemployment rate)** and 15-74 years **(total unemployment rate)** as a share of the total economically active population of the same age class. It consists of 4 sub-indicators: 1. **total unemployment rate** 2. **youth unemployment rate** 3. **total unemployment rate in rural areas** 4. **youth unemployment rate in rural areas** Unemployed persons comprise persons who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week, 2. available for work at the time, 3. actively seeking work. Economically active population is employed (see definition in indicator C.06) plus unemployed. **Methodology**: Based on the Labour Force Survey (LFS), the total/youth unemployment rate of each country can be disaggregated by degree of urbanisation. The degree of urbanisation classifies the territory (Local Administrative Units (LAU)) into 'rural areas', 'towns and suburbs' and 'cities'. The rural unemployment rate of each Member State could then be compared with the unemployment rates in the other two types of areas or with the unemployment rate for the whole country. Additionally, unemployment rates could also be calculated for men and women and even for other age groups, if needed for a better analysis.
Unit of measurement	1 - 4: share of total active population of the same age class
Data source	Eurostat – Labour Force Survey
References/ location of the data	National data: Unemployment rate by age: [TEPSR_WC170] Unemployment by degree of urbanisation [lfsa_pgauws] Regional data (NUTS 1 and 2): Unemployment rates by sex, age and NUTS 2 regions [lfst_r_lfu3rt]
Data collection level	EU, National (NUTS 0), Regional (NUTS 1 and 2) by degree of urbanisation (rural areas, towns and suburbs, cities)
Frequency	LFS data are collected on a continuous basis and quarterly/annual results are produced. Data by degree of urbanisation are disseminated by Eurostat annually
Delay	4 months
Comments/caveats	The age classes 15-74 and 15-24 are used both for national and regional tables.

INDICATOR C.08	
Indicator Name	**GDP per capita**
Type of indicator	**Socio-economic**
Definition	**Gross Domestic Product (GDP)** per capita in predominantly rural regions, in **Purchasing Power Standard (PPS)**[4] The index of GDP per capita in Purchasing Power Standards (PPS) is expressed in relation to the European Union average set to equal 100. In particular, the following 2 sub-indicators are calculated: 1. **Index of GDP expressed in PPS per inhabitant at national level** 2. **Index of GDP expressed in PPS per inhabitant in percentage of the EU average** for **predominantly rural regions**.
Unit of measurement	1 - 2: Index of GDP in PPS per inhabitant
Data source	Eurostat – National and Regional Economic Accounts Eurostat — Rural development statistics
References/location of the data	National data: table [nama_10_gdp], [nama_10_pc] Regional data: table [nama_10r_3popgdp], [nama_10r_3gdp] National data, by typology: table Gross domestic product (GDP) at current market prices by other typologies [urt_10r_3gdp] Most recent urban-rural typology: https://ec.europa.eu/eurostat/web/rural-development/methodology
Data collection level	EU, National (NUTS 0), Regional (NUTS 1, 2 and 3) by type of region (predominantly rural, intermediate and predominantly urban)
Frequency	Annual
Delay	1 year (national data) and 3 years (regional data)
Comments/caveats	As an average, this indicator does not measure the distribution of income within a given geographical area. Furthermore, non-monetary exchanges (production for self- consumption; public goods and externalities; barter; unpaid family labour) are not taken into account but can be substantial in some sectors (especially in agriculture) and regions.

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[4] The Purchasing Power Standard, abbreviated as PPS, is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective Purchasing Power Parities.

INDICATOR C.09	
Indicator Name	**Poverty rate**
Type of indicator	**Socio-economic**
Definition	**The indicator is defined as the share of population at risk of poverty or social exclusion in rural areas**, as defined in the classification of the degree of urbanisation (DEGURBA). It is calculated as the percentage of people who are at risk of poverty or severely deprived or living in a household with low work intensity over the total population. (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_(AROPE). The rate of rural poverty (share of population at risk of poverty or social exclusion) can be compared to the overall EU average, to the respective national average and/or to the average for intermediate and/or urban areas in a Member State or in the EU (choice to be made according to the policy objective). It consists of 2 sub-indicators: 1. **total poverty rate** 2. **poverty rate in rural areas**
Unit of measurement	1: share of total population 2: share of total population by degree of urbanisation
Data source	Eurostat – Survey on income and living conditions (SILC) Eurostat – Degree of urbanisation
References/location of the data	National data: table People at risk of poverty or social exclusion by age and sex [ilc_peps01] National data, by degree of urbanisation: table [ilc_peps13] Regional data: table [ilc_peps11] (regional data are not available for some MS)
Data collection level	EU, National (NUTS 0), Regional (NUTS 1 and 2) by degree of urbanisation (rural areas, towns and suburbs, cities)
Frequency	Annual
Delay	2 years
Comments/caveats	

INDICATOR C.10	
Indicator Name	**Structure of the economy**
Type of indicator	**Socio-economic**
Definition	**The Total Gross Value Added (GVA)** (at basic prices), is defined as the value of output less the value of intermediate consumption Output is valued at basic prices, GVA is valued at basic prices and intermediate consumption is valued at purchasers' prices. It consists of 3 sub-indicators: 1. **total GVA** 2. **GVA by sector** (primary, secondary, tertiary) 3. **GVA by type of region** (predominantly rural, intermediate and predominantly urban)
Unit of measurement	1: EUR million 2: share of total GVA 3: share of total GVA
Data source	Eurostat – National and Regional Economic Accounts
References/location of the data	National data: table Gross value added and income by A*10 industry breakdowns [nama_10_a10] National data, by typology: table Gross value added at basic prices by other typologies [urt_10r_3gva] Regional data: table Gross value added at basic prices by NUTS 3 regions [nama_10r_3gva]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1, 2 and 3)
Frequency	Annual
Delay	1 year (national data, GVA in agriculture) and 3 years (regional data, Structural Business Statistics)
Comments/caveats	Sectors in NACE rev.2: Primary sector = branch A (agriculture, forestry and fishing); Secondary sector = branches B-E + F (industry + construction); Tertiary sector = branches G-I + J + K + L + M-N + O-Q + R-U. The distribution of GVA by type of region has been calculated using the Commission's urban-rural typology, which classifies NUTS 3 regions into predominantly rural, intermediate and predominantly urban.

INDICATOR C.11	
Indicator Name	**Structure of employment**
Type of indicator	**Socio-economic**
Definition	This indicator shows **employment figures** for 3 sub-indicators: 1. **total employment** 2. **employment by sector** (primary, secondary, tertiary) 3. **employment by type of region** (predominantly rural, intermediate and predominantly urban)
Unit of measurement	1: number of persons (in thousands) 2: share of total employment 3: share of total employment
Data source	1: Tables on EU policy 2: Eurostat – Labour Force Survey 3: Eurostat – Regional Economic Accounts
References/location of the data	1 : National data, Employment and activity by sex and age - annual data [lfsi_emp_a] 2: Eurostat website, Labour Force Survey: national data, Employment by sex, age and detailed economic activity (from 2008 onwards, NACE Rev. 2 two digit level) - 1 000 [lfsa_egan22d] 3: Regional : table [nama_10r_3empers] Regional data: table [lfst_r_lfe2en2] for totals; employment by economic activity on special request to Eurostat Most recent urban-rural typology: https://ec.europa.eu/eurostat/web/rural-development/methodology
Data collection level	EU, national (NUTS 0) and regional (NUTS 1, 2 and 3)
Frequency	Annual
Delay	1 year (national data) and 3 years (regional data)
Comments/caveats	Sectors in NACE rev.2: Primary sector = branch A (agriculture, forestry and fishing); Secondary sector = branches B-E + F (industry + construction); Tertiary sector = branches G-I + J + K + L + M-N + O-Q + R-U. The distribution of employment by type of region has been calculated using the Commission's urban-rural typology, which classifies NUTS 3 regions into predominantly rural, intermediate and predominantly urban.

INDICATOR C.12	
Indicator Name	**Labour productivity by economic sector**
Type of indicator	**Socio-economic**
Definition	This indicator calculates the **Gross Value Added (GVA) per employed person, total and by sector (primary, secondary, tertiary) and by type of region (predominantly rural, intermediate and predominantly urban).** GVA is calculated at basic prices. Dividing this value by the number of employed persons allows for a comparison of **labour productivity** over the different sectors and regions. It consists of 3 sub-indicators: 1. **total labour productivity** 2. **labour productivity by sector** (primary, secondary, tertiary) 3. **labour productivity by type of region** (predominantly rural, intermediate and predominantly urban)
Unit of measurement	1-3: EUR/person
Data source	Eurostat – National and Regional Economic Accounts
References/location of the data	National and regional data: DG AGRI calculation using national and regional data from C.10 and C.11 Gross value added and income by A*10 industry breakdowns [nama_10_a10] National data, by typology: table Gross value added at basic prices by other typologies [urt_10r_3gva] Regional data: table Gross value added at basic prices by NUTS 3 regions [nama_10r_3gva] Most recent urban-rural typology: ec.europa.eu/eurostat/web/rural-development/methodology
Data collection level	For sectors and type of regions: EU, National (NUTS 0), Regional (NUTS 1, 2 and 3) by type of region (predominantly rural, intermediate and predominantly urban)
Frequency	Annual
Delay	1 year (national data, GVA in agriculture) and 3 years (regional data, Structural Business Statistics)
Comments/caveats	Sectors in NACE rev.2: Primary sector = branch A (agriculture, forestry and fishing); Secondary sector = branches B-E + F (industry + construction); Tertiary sector = branches G-I + J + K + L + M-N + O-Q + R-U. For the distribution of employment by type of region, the Commission's urban-rural typology, which classifies NUTS 3 regions into predominantly rural, intermediate and predominantly urban, will be used.

INDICATOR C.13	
Indicator Name	**Employment by economic activity**
Type of indicator	**Sectorial**
Definition	The indicator gives **total employment in agriculture, forestry, the food industry and in tourism in absolute terms** and also as a **share of total employment**.
	The absolute change and the annual growth of employment at national level are also calculated in general as a three-year average. If the available data allow, the calculation of five-year averages is also possible.
	The Labour Force Survey (LFS) is the main data source for the domain employment. The EU LFS is a large household sample survey providing quarterly results on labour participation of people aged 15 years and over (16 years and over in Spain and Italy, 15-74 years in Estonia, Latvia, Hungary, Finland, Sweden and Denmark).
	In the Eurostat LFS database (according to the NACE rev.2 divisions) agriculture corresponds to "crop and animal production, hunting and related activities" (A01), while forestry means "forestry and logging" (A02), the food industry is equal to "manufacture of food products" (C10) and "manufacture of beverages" (C11) and "manufacture of tobacco products" (C12), tourism corresponds to "accommodation" (I55) and "food and beverage service activities" (I56).
	This indicator shows **employment figures for 2 sub-indicators:**
	1. **total employment**
	2. **employment by economic activity** (agriculture, forestry, the food industry, tourism), **total and as a share of total**
Unit of measurement	1: 1000 persons
	2: 1000 persons and % of total employment
Data source	Eurostat – Labour Force Survey
References/location of the data	Eurostat website, Labour Force Survey: lfsa_egan2 and lfsa_egan22d
	Regional data: lfst_r_lfe2en2 for totals; employment by economic activity on special request to Eurostat
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	Regional data at NUTS 2 level are published as annual averages of quarterly data.
	The calculation of the indicator is made on a yearly basis.
Delay	1 year
Comments/caveats	

INDICATOR C.14	
Indicator Name	**Labour productivity in agriculture**
Type of indicator	**Sectorial**
Definition	Labour productivity in agriculture is expressed as **total Gross Value Added (GVA) in agriculture at basic prices per Annual Work Unit (AWU).** GVA is defined as the value of output less the value of intermediate consumption. Output is valued at basic prices, GVA is valued at basic prices and intermediate consumption is valued at purchasers' prices. The basic price is defined as the price received by the producer, after deduction of all taxes on products but including all subsidies on products. GVA per AWU provides comparable data on labour productivity and allows for comparison between sub-sectors and countries. **A three-years average mitigates short-term fluctuations. Labour productivity in agriculture is then calculated as the ratio of the averages**: (three-years average GVA) / (three- years average labour force).
Unit of measurement	EUR/AWU
Data source	Eurostat - Economic Accounts for Agriculture (EEA) Eurostat - Agricultural Labour Input Statistics
References/location of the data	EEA for GVA values at current prices: aact_eaa01 EEA for GVA values at constant prices: aact_eaa03 Agricultural Labour Input Statistics for AWU values: aact_ali01
Data collection level	EU and national (NUTS 0)
Frequency	Annual
Delay	1 year
Comments/caveats	Due to the lack of available regional data, this indicator can only be calculated at national level.

INDICATOR C.15	
Indicator Name	**Labour productivity in forestry**
Type of indicator	**Sectorial**
Definition	Labour productivity in forestry is expressed **as total Gross Value Added in forestry at basic prices per Annual Work Unit (AWU).** The forestry sector corresponds to division 02 in NACE rev. 1.1 (Forestry and logging). GVA is defined as the value of output less the value of intermediate consumption. Output is valued at basic prices, GVA is valued at basic prices and intermediate consumption is valued at purchasers' prices. The basic price is defined as the price received by the producer, after deduction of all taxes on products but including all subsidies on products. GVA per AWU provides comparable data on labour productivity and allows for comparison between sub-sectors and countries. A **three-years average mitigates short-term fluctuations. Labour productivity in forestry is then calculated as the ratio of the averages**: (three-years average GVA)/(three-years average employment).
Unit of measurement	EUR/AWU
Data source	Eurostat
References/location of the data	Eurostat - Economic accounts for forestry and logging [for_eco_cp] Eurostat - Annual work units in forestry and logging [for_awu]
Data collection level	EU and national (NUTS 0)
Frequency	Annual
Delay	2-3 years
Comments/caveats	Due to the lack of available regional data this indicator can only be calculated at national level and not for all Member States.

INDICATOR C.16	
Indicator Name	**Labour productivity in the food industry**
Type of indicator	**Sectorial**
Definition	Labour productivity in the food industry is expressed as total **Gross Value Added (GVA) in the food industry per person employed.** GVA is defined as the value of output less the value of intermediate consumption. Output is valued at basic prices, GVA is valued at basic prices and intermediate consumption is valued at purchasers' prices. The food industry sector corresponds to NACE rev.2 = Manufacture of food products; beverages and tobacco products (C10+C12). **A three-years average mitigates short-term fluctuations. Labour productivity in the food industry is then calculated as the ratio of the averages**: (three-years average GVA)/(three-years average number of persons employed).
Unit of measurement	EUR/person
Data source	Eurostat - National Accounts Eurostat - Labour Force Survey
References/location of the data	National Accounts: table nama_10_a64 Labour Force Survey: table lfsa_egan22d
Data collection level	EU and national (NUTS 0)
Frequency	Annual
Delay	2 years
Comments/caveats	Due to the lack of regional data, this indicator can only be calculated at national level.

INDICATOR C.17	
Indicator Name	**Agricultural holdings (farms)**
Type of indicator	**Sectorial**
Definition	This indicator consists of 4 sub-indicators: 1. **Number of agricultural holdings** 2. **Average size of the holdings - physical size** 3. **Average size of the holdings - economic size** 4. **Average size of the holdings - labour size - in persons and in annual work units (AWU)** The first four sub-indicators provide basic information on the **total number of farms, ha of UAA, EUR of SO and the total number of persons employed or AWU** for each EU Member State. Quantities are presented in absolute figures and serve as a basis for the calculation of the fifth sub-indicator. The physical farm size measured in ha of UAA per farm contains the following size classes: • Zero ha • Less than 2 ha • From 2 to 4.9 ha • From 10 to 19.9 ha • From 20 to 29.9 ha • From 30 to 49.9 ha • From 50 to 99.9 ha • 100 ha and over The economic farm size is measured according to the following classes: • Zero EUR • Less than 2 000 EUR • From 2 000 to 3 999 EUR • From 4000 to 7 999 EUR • From 8000 to 14 999 EUR • From 15 000 to 24 999 EUR • From 25 000 to 49 999 EUR • From 50 000 to 99 999 EUR • From 100 000 to 249 999 EUR • From 250 000 to 499 999 EUR • 500 000 EUR and over
Unit of measurement	1: number of holdings 2:ha UAA/holding 3: EUR of SO/holding 4:persons/holding; AWU/holding
Data source	Eurostat – Farm Structure Survey (FSS)
References/location of the data	For number of farms, for the physical size (ha of UAA) and for the economic size of farms (SO): for 2013 and before [ef_kvaareg], for 2016 and after [ef_m_farmleg] For the labour force size: [ef_olfreg]

	For regional data:[ef_kvecsleg],[ef_olfreg][ef_m_farmleg]; [ef_lf_main]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	FSS: full census every 10 years, intermediate surveys 2/3 times in-between.
Delay	2-3 years
Comments/caveats	Persons include regular labour force only.

INDICATOR C.18	
Indicator Name	**Agricultural area**
Type of indicator	**Sectorial**
Definition	The indicator is expressed as **the total utilised agricultural area (UAA) in absolute terms (ha) and as the share of UAA in different categories of land use**. It consists of 2 sub-indicators:: 1. **total utilised agricultural area (UAA)** 2. **total and share of UAA by categories of land cover** According to the definition applied in the Eurostat database, the categories of land use are as follows: • Arable land • Permanent grassland and meadow • Permanent crops
Unit of measurement	1: number of ha 2: ha and share of total UAA
Data source	Eurostat – Crop production
References/location of the data	National and regional data: [apro_cpsh1]; [apro_cpshr]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	annual
Delay	1-2 years
Comments/caveats	Codes for land use: arable land (ARA), permanent grassland (J0000) and permanent crops (PECR).

INDICATOR C.19	
Indicator Name	**Agricultural area under organic farming**
Type of indicator	**Sectorial**
Definition	The indicator shows **the area under organic farming.** The indicator has 3 sub-indicators: 1. **share of area under organic farming in the total utilised agricultural area (UAA)** 2. **area fully converted to organic farming** 3. **area under conversion to organic farming** The area under organic farming is classified as follows: 4. fully converted to organic farming 5. under conversion to organic farming 6. total fully converted and under conversion to organic farming Farming is considered to be organic if it complies with the relevant EU legislation. The area defined refers to the Utilised agricultural area excluding kitchen garden as from the "Organic crop area by agricultural production methods and crops". It might not be strictly comparable with the definition of UAA (only area of main crops) in the Farm Structure Survey (FSS). Data on the area under organic farming at regional level come from the FSS.
Unit of measurement	1: share of total UAA 2-3: ha
Data source	Eurostat – Organic farming Eurostat – Farm Structure Survey (FSS)
References/location of the data	National data: table Area under organic farming [org_cropar] from 2012 onwards Regional data: table Main farmland use by NUTS 2 regions [Ef_lus_main] contains data from 2013 onwards. Data from FSS is available on request to Eurostat.
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	Organic farming statistics: annual For FSS data: full census every 10 years, intermediate surveys 2/3 times in-between.
Delay	FSS: 2-3 years
Comments/caveats	There are differences between national and regional data because the former is collected by Eurostat and the latter is based on the Farm structure survey (FSS). It means that the samples and data collection methods are different. Variables for table [ef_mporganic]: AGRAREA_HA (ha: Utilised agricultural area), A_3_2_1_HA (ha: Organic farming – certified), A_3_2_2_HA (ha: Farming system - Conversion to organic farming), A_3_2_3_HA (ha: Organic farming (incl. in conversion)).

INDICATOR C.20	
Indicator Name	**Irrigated land**
Type of indicator	**Sectorial**
Definition	The indicator shows **the total irrigated land**. It consists of 2 sub-indicators: 1. **total irrigated area** 2. **share of the Utilised Agricultural Area** (UAA). Irrigated area is defined as the area of crops which have actually been irrigated at least once during the 12 months prior to the reference day of the survey. Crops under glass and kitchen gardens, which are almost always irrigated, should not be included. Utilised Agricultural Area consists in the total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens. As a general assumption, crops under glass (greenhouses) as well as kitchen gardens are considered actually irrigated areas but should not be included here. However, national methodologies may differ when including or excluding 'areas under glass' and 'kitchen gardens' in the 'total irrigated areas'; possible inconsistencies are being scrutinized by Eurostat.
Unit of measurement	1: ha 2: share of total UAA
Data source	Eurostat - Farm Structure Survey (FSS), Survey on Agriculture Production Methods (SAPM) 2010.
References/location of the data	National and regional data: table ef_poirrig
Data collection level	National (NUTS 0) and regional (NUTS 1 and 2)
Frequency	The Survey on Agricultural Production Methods (SAPM) is a once-only survey carried out in 2010.
Delay	2-3 years (Eurostat, Survey on Agricultural Production Methods)
Comments/caveats	The availability of this data source in the future is under discussion.

INDICATOR C.21	
Indicator Name	**Livestock units**
Type of indicator	**Sectorial**
Definition	This indicator gives **the total number of livestock of the holdings with livestock**. LSU facilitates the aggregation of livestock from various species and ages. LSU coefficients are used instead of the actual number of animals in order to make comparable aggregations of different animal categories.
Unit of measurement	LSU of the holdings with livestock
Data source	Eurostat – Farm Structure Survey (FSS)
References/location of the data	For national and regional data for 2013 and before: [ef_olslsuft] and [ef_olsaareg]; [ef_olslsureg] For 2016 and 2020: [ef_lsk_bovine], [ef_lsk_poultry], [ef_lsk_main] and [ef_lus_main]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	FSS: full census every 10 years, intermediate surveys 2/3 times in-between.
Delay	2-3 years
Comments/caveats	

INDICATOR C.22	
Indicator Name	**Farm labour force**
Type of indicator	Sectorial
Definition	The indicator shows the **labour force directly employed by the agricultural holding and working regularly.** The farm labour force of the holding includes all persons having completed their compulsory education (having reached school-leaving age) who carried out farm work on the holding during the 12 months ending on the reference day of the survey. All persons of retirement age who continue to work on the holding are included in the farm labour force. Total and by sex for the different categories of farm labour force: • regular labour force: ➢ family labour force (sole holders working in the farm + members of the sole holder's family working in the farm) ➢ non-family labour force • non-regular labour force (only AWU) This indicator consists of 2 sub-indicators: **1. total regular farm labour force, in persons** 2. **total regular farm labour force, in AWU**
Unit of measurement	1. persons 2. AWU
Data source	Eurostat – Farm Structure Survey (FSS)
References/location of the data	FSS 2013 and before: For national data: [ef_olfaa] For regional data and labour force by sex: [ef_olfreg] FSS 2016: For national, regional data and labour force by sex: [ef_lf_size]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	FSS: full census every 10 years, intermediate surveys 2/3 times in-between.
Delay	2-3 years
Comments/caveats	Due to the high share of part-time work in agriculture, labour input can be better assessed in terms of AWU than in terms of persons.

INDICATOR C.23	
Indicator Name	**Age structure of farm managers**
Type of indicator	**Sectorial**

Definition	The indicator shows the **total number of managers in different age categories.**
	
	It consists of 3 sub-indicators:
	   1. **total number of farm managers**
	   2. **number of managers by age groups** and the share of the total
	   3. **ratio between young farm managers and elderly farm managers**.
	
	The age classes represented are:
	a) managers who are younger than 35 years, managers between 35 and 54 years, managers of 55 years and over a
	b) managers who are younger than 40 years, managers
	between 40 and 64 years, managers of 65 years and over
	
	The manager of the holding is the natural person responsible for the normal daily financial and production routines of running the holding concerned. The holder is the natural person, group of natural persons or legal person on whose account and in whose name the holding is operated and who is legally and economically responsible for the holding, i.e. who takes the economic risks of the holding. The manager and the holder can be the same person.

Unit of measurement	1. total number of farm managers
	   2. number and share of total farm managers
	   3. ratio of young managers to elderly

Data source	Eurostat – Farm Structure Survey (FSS)
References/location of the data	FSS 2013 and before: National data: [ef_kvage] Regional data on special request to Eurostat FSS 2016 and 2020: National and regional data: [ef_m_farmang]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	FSS: full census every 10 years, intermediate surveys 2/3 times in-between.
Delay	2-3 years
Comments/caveats	For FSS-2013 and before data at regional level (NUTS 1 or 2) on the age of farm managers are not available in the Eurostat public database and need to be requested from Eurostat.

INDICATOR C.24	
Indicator Name	**Agricultural training of farm managers**
Type of indicator	**Sectorial**
Definition	The indicator provides information on **the farm managers who have attained basic and full education levels in agriculture.** It consists of 2 sub-indicators: 1. **share of total farm managers by level of agricultural training** 2. **share of total farm managers by age and by level of agricultural training**. The different categories of agricultural training are defined as follows: • Only practical agricultural experience: experience acquired through practical work on an agricultural holding. • Basic agricultural training: any training courses completed at a general agricultural college and/or an institution specialising in certain subjects (including horticulture, viticulture, sylviculture, pisciculture, veterinary science, agricultural technology and associated subjects). A completed agricultural apprenticeship is regarded as basic training. • Full agricultural training: any training course continuing for the equivalent of at least two years full time training after the end of compulsory education and completed at an agricultural college, university or other institute of higher education in agriculture, horticulture, viticulture, sylviculture, pisciculture, veterinary science, agricultural technology or an associated subject. **The age classes represented are:** **a) managers who are younger than 35 years, managers between 35 and 54 years, managers of 55 years and over a** **b) managers who are younger than 40 years, managers between 40 and 64 years, managers of 65 years and over**
Unit of measurement	1-2: share of total managers
Data source	Eurostat – Farm Structure Survey
References/location of the data	FSS 2013 and before: National data: [ef_mptrainman] Regional data: on special request to Eurostat FSS 2016: National and regional data: [ef_mp_training]
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	FSS: full census every 10 years, intermediate surveys 2-3 times in-between.
Delay	2-3 years
Comments/caveats	For FSS-2013 and before data at regional level (NUTS 1 or 2) on the training of farm managers are not available in the Eurostat public database and need to be requested from Eurostat.

INDICATOR C.25	
Indicator Name	**Agricultural factor income**
Type of indicator	**Sectorial**

Definition	**Agricultural factor income** measures the remuneration of all factors of production (land, capital, labour) regardless of whether they are owned or borrowed/rented and represents all the value generated by a unit engaged in an agricultural production activity.
	
	 It corresponds to the **net value added at factor cost.**
	 Value of agricultural production
	        - variable input costs (fertilisers, pesticides, feed, etc.)
	        - depreciation
	        - total taxes (on products and production)
	        + total subsidies (on products and production)
	 = agricultural factor income (net value added at factor costs)
	
	 The indicator consists of 2 sub indicators:
	
	 1. **Agricultural factor income per annual work unit (AWU)**. An AWU in agriculture corresponds to the work performed by one person who is occupied on an agricultural holding on a full-time basis. For this indicator, total (paid and unpaid) AWU are used.
	 2. The **index of agricultural factor income per AWU** is already available in Eurostat's Economic Accounts for Agriculture as **Indicator A.** This index is particularly suited for showing developments over time.

Unit of measurement	1. EUR (in real terms)/AWU 2. Index 2005 =100
Data source	1. Eurostat, Economic Accounts for Agriculture and Agricultural Labour Input Statistics 2. Eurostat, Economic Accounts for Agriculture
References/location of the data	**Agricultural factor income:** *Economic accounts for agriculture - values at real prices* (aact_eaa04) • Production value at basic price • Factor income: code 26000 **Agricultural labour input:** *Agricultural Labour Input Statistics: absolute figures (1 000 annual work units) (*aact_ali01) **Index of agricultural factor income/AWU (Indicator A):** *Economic accounts for agriculture - agricultural income (indicators A, B, C) (*aact_eaa06*)*
Data collection level	1. EU, national (NUTS 0) and regional (NUTS 1 and 2) – where data are available 2. EU and national (NUTS 0)
Frequency	Annual
Delay	1 year
Comments/caveats	Agricultural factor income is best suited for evaluating the impact of changes in the level of public support (i.e. direct payments) on the capacity of farmers to reimburse capital, pay for wages and rented land as well as to reward their own production factors. In this context one should note that the proportion of own and external production factors

	varies in some cases significantly between and within Member States and that the remuneration of own and external production factors is often unequal at farm level.
	Regional data are not available for all Member States.

INDICATOR C.26	
Indicator Name	**Agricultural entrepreneurial income**
Type of indicator	**Sectorial**

Definition	**Agricultural entrepreneurial income[5] measures the income derived from agricultural activities that can be used for the remuneration of own production factors**, i.e. non-salaried (= family) labour, land belonging to the agricultural holding and own capital. It is obtained by deducting wages, rent and interest payments from agricultural factor income (see C. 25).
	
	Value of agricultural production
	       - variable input costs (fertilisers, pesticides, feed, etc.)
	       - depreciation
	       - total taxes (on products and production)
	       + total subsidies (on products and production)
	= agricultural factor income (net value added at factor costs)
	       - wages
	       - rents
	       - interest paid
	= agricultural entrepreneurial income
	
	In the case of family farms (sole proprietorships), entrepreneurial income represents, on the one hand, the compensation of the work performed by the agricultural holder (and the work of non-salaried family members) and, on the other hand, the income remaining with the enterprise, without it being possible to separate these two components. It is, therefore, a mixed income.
	
	It consists of 2 sub-indicators:
	
	1. **Agricultural entrepreneurial income per unpaid annual work unit** (AWU) is expressed in absolute terms or as an index.
	
	2. **Income per family worker compared to the wages employees in the whole economy** (based on EUR/hour worked)
	
	The index of agricultural entrepreneurial income per unpaid AWU can be obtained directly from Eurostat's Economic Accounts for Agriculture as Indicator B.
	
	Agricultural entrepreneurial income (in real and current prices)
	
	AWU in agriculture, which corresponds to the work performed by one person who is occupied on an agricultural holding on a full-time basis. A distinction is made between salaried and non-salaried AWU, which together make total AWU. Agricultural entrepreneurial income is divided by non-salaried AWU in order to show the level of agricultural entrepreneurial income for the farm holder and members of his/her family. In order to compare this "family farm income" with the average wages in the economy, AWUs in agriculture need to be converted into

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[5] See also Annex I Chapter V Agricultural Income Indicators of Regulation (EC) No 138/2004 of the European Parliament and of the Council of 5 December 2003 on the economic accounts for agriculture in the Community.

	number of hours worked: a standard conversion factor of 1800 hours per AWU and per year is used.
	Gross wages and salaries in all NACE activities at current prices in cash and in kind. Wages and salaries in cash include the values of any social contributions, income taxes, etc. payable by the employee, even if withheld and actually paid directly by the employer on behalf of the employee.
	The **total number of hours worked per employee in all NACE activities**.
Unit of measurement	1: EUR/ non-salaried AWU or index value
	2: share of total
Data source	Eurostat – Economic Accounts for Agriculture
	Eurostat – Agricultural Labour Input Statistics
	Eurostat – National Accounts
References/location of the data	**Agricultural entrepreneurial income:**
	Economic accounts for agriculture - values at current prices (aact_eaa01)
	Economic accounts for agriculture - values at real prices (aact_eaa04)
	• Production value at basic price
	• Entrepreneurial income: code 31000
	Agricultural labour input:
	Agricultural Labour Input Statistics: absolute figures (1 000 annual work units) (aact_ali01)
	Index of agricultural entrepreneurial income/non-salaried AWU (Indicator B):
	Economic accounts for agriculture – agricultural income (indicators A, B, C) (aact_eaa06)
	Wages and salaries:
	National Accounts by 10 branches - aggregates at current prices: gross wages and salaries (nama_10_a10)
	Employment:
	National Accounts by 10 branches - employment data (nama_10_a10e)
Data collection level	1. EU, national (NUTS 0) and regional (NUTS 1 and 2) – where data are available
	2. EU and national (NUTS 0)
Frequency	Annual
Delay	1 year
Comments/caveats	It has to be borne in mind that these income aggregates are not indicators of total income or of the disposable income of households employed in agriculture, because the latter, in addition to their purely agricultural incomes, may also have income from other sources (non-agricultural activities, remuneration, social benefits, and income from property). In other words, agricultural entrepreneurial income must not be regarded as farmers' income. Moreover, this measure of income relates to the income generated by agricultural activities (as well as inseparable non-agricultural secondary activities) over a given

	accounting period, even though in certain cases the corresponding revenues will not be received until a later date. It does not, therefore, constitute the income effectively received in the course of the accounting period itself.
	The indicator farm household income cannot be calculated as there is no methodology or data in Eurostat for this purpose.
	Regional data are not available for all Member States. The comparison of agricultural entrepreneurial income with average wages in the economy cannot be done at regional level.

INDICATOR C.27	
Indicator Name	**Total factor productivity in agriculture**
Type of indicator	**Sectorial**
Definition	**Total factor productivity (TFP) compares total outputs relative to the total inputs used in production of the output. As both output and inputs are expressed in term of volume indices, the indicator measures TFP growth.** The change in production and input volumes is measured over a defined period (2005=100). To aggregate the different output (and input) volume indices, the production (and input) values are used as weights. This allows capturing the relative importance between outputs, or inputs. **TFP reflects output per unit of some combined set of inputs: an increase in TFP reflects a gain in output quantity which is not originating in from an increase of input use.** As a result, TFP reveals the joint effects of many factors including new technologies, efficiency gains, economies of scale, managerial skill, and changes in the organization of production. TFP index is defined as the ratio between an Output Index (i.e. the change in production volumes over a considered period) and an Input Index (the corresponding change in inputs/factors used to produce them). Output and input indices are calculated as weighted averages of changes in produced quantities and in input quantities respectively, where the weights are represented by the production value of the various products and the expenditure for each of the four considered production factors (intermediate inputs, land, labour, capital). Depending on the type of average applied and the chosen reference period for the weights, the TFP indicator assumes different analytical forms. Laspeyres indices are defined as arithmetic means with weighting factors referring to the time 0 (base year), while Paasche indices are harmonic means with weighting factors referring to the time t (current year). In formula, the TFP Laspeyres index is given by: $$TFP_0^t\_L = \frac{O_0^t\_L}{I_0^t\_L} =$$ $$\frac{\left(\dfrac{q_{1t}}{q_{10}}*w_{10} + \dfrac{q_{2t}}{q_{20}}*w_{20} + ... + \dfrac{q_{nt}}{q_{n0}}*w_{n0}\right)/(w_{10}+w_{20}+...+w_{n0})}{\left(\dfrac{i_{1t}}{i_{10}}*x_{10} + \dfrac{i_{2t}}{i_{20}}*x_{20} + ... + \dfrac{i_{rt}}{i_{r0}}*x_{r0}\right)/(x_{10}+x_{20}+...+x_{r0})},$$ while TFP Paasche index is defined as:

	$$TFP_0^t \_ P = \frac{O_0^t \_ P}{I_0^t \_ P} =$$ $$\frac{\left(\left(\frac{q_{10}}{q_{1t}} * w_{1t} + \frac{q_{20}}{q_{2t}} * w_{2t} + ... + \frac{q_{n0}}{q_{nt}} * w_{nt}\right) / \left(w_{1t} + w_{2t} + ... + w_{nt}\right)\right)^{-1}}{\left(\left(\frac{i_{10}}{i_{1t}} * x_{1t} + \frac{i_{20}}{i_{2t}} * x_{2t} + ... + \frac{i_{r0}}{i_{rt}} * x_{rt}\right) / \left(x_{1t} + x_{2t} + ... + x_{rt}\right)\right)^{-1}},$$ where q_{jt} and i_{kt} are respectively the quantity of product j and factor k at time t, while w_{jt} and x_{kt} are the weights of product j and factor k within the agricultural sector. Finally, the geometrical average of the Laspeyres and the Paasche index gives the Fischer index, which benefits from the most suitable statistical properties. In formula, the TFP Fisher index is computed as follows: $$TFP\_F = \sqrt{TFP\_L * TFP\_P}$$
Unit of measurement	Index (3-year moving average)
Data source	The **Economic Accounts for Agriculture (EAA)** from Eurostat. The volume indices calculated by Eurostat are Laspeyres indices and changes in volume are measured using the weightings for the preceding year to guarantee the weightings are relatively up-to-date (see Reg. N° 138/2004). They correspond to the term q_{lt}/q_{l0} of the equations displayed above. Precise indicators chosen in the EAA: - Change in output volume (q_{lt}/q_{l0}): Volume Indices, n-1 = 100, Production value at producer price (aact_eaa05) - Output weights: Real price in Euro, 2010 = 100, Production value at producer price (aact_eaa04) - Change in input volume (i_{lt}/i_{l0}) for every input except land and labour cost: Volume Indices, n-1 = 100, Production value at basic price (aact_eaa05) - Input weights: Real price in Euro, 2010 = 100, Production value at basic price (aact_eaa04) - Volume index for labour costs: Change in Total labour input measured in 1000 AWU (aact_ali01) - Correction of the weight for labour costs to cover the family labour costs: the compensation of employees is divided by the share of paid labour also directly available from the EAA (aact_ali01) - Volume index of the UAA: Change in Total UAA available in the EAA (apro_cpsh1). Complementary data is required from: - the **Farm Structure Survey (FSS - Eurostat)** to assess the share of rented land (in order to correct the weight of land by including the own land) (ef_mptenure). - the **Agricultural Production Data – Crop Products** (**Eurostat**) for the volume index of the UAA (apro_cpsh1). - the **Farm Accountancy Data Network** to estimate the national average depreciation rate.

References/location of the data	Eurostat: EAA, APRO, ALI, FSS; FADN
Data collection level	National (NUTS 0)
Frequency	Annual
Delay	Year N-2
Comments/caveats	The climatic conditions affecting crop yields have strong impact on the crop output and as a consequence on the indicator. Therefore, a moving average over 3 years is to be calculated to smooth the weather effect.

The level of detailed information required to compile the indices (especially for the Paasche Index) does not allow for calculating long time series and complicates the calculation for the EU aggregates.

The length of the time series varies according to MS.

There are breaks in time series and data is missing for some years, especially in the Agricultural Production Data. The methodology to value the fixed capital consumption seems to vary over time. Concerning the labour input any change in accounting rules has been normally smoothed. Nevertheless this volume index is to be checked very carefully because the TFP indicator is very sensitive to any variation in labour input.

The calculation of regional values is not possible due to the lack of data at such detailed geographical level. |

INDICATOR C.28	
Indicator Name	**Gross fixed capital formation in agriculture**
Type of indicator	**Sectorial**
Definition	The indicator measures **producers' investments, deducting disposals, in fixed assets during a given period plus certain additions to the value of non-produced assets** realized by the productive activity of producer or institutional units (ESA 2010 definition). Therefore, GFCF is a key element for future competitiveness. It has 2 sub-indicators: 1.GFCF in current prices 2. share of the Gross Value Added (GVA) in agriculture.
Unit of measurement	EUR million (in current prices); 2 .% of GVA in agriculture.
Data source	Eurostat – Economic Accounts for Agriculture, National Accounts
References /location of the data	National data: table aact_eaa01 (aact_eaa05 and aact_eaa07 were used to calculate GFCF at constant prices) Regional data: table nama_10r_3gva (GVA in agriculture, forestry and fishing) and nama_10r_2gfcf
Data collection level	National (NUTS 0) Regional (NUTS 1 and 2)
Frequency	Annual
Delay	The expected delay will be two to three years, depending on the database.
Comments /caveats	GFCF variables for table aact_eaa01: Production value at basic price; 34000 Gross fixed capital formation (excluding deductible VAT); variables for table nama_10r_2gfcf: Agriculture, forestry and fishing. GVA variables for table aact_eaa01: Gross value added at basic prices; variable for table nama_10r_3gva: Agriculture, forestry and fishing. There are differences between national and regional data since the former is based on the Economic accounts for agriculture and the latter is related to the National Accounts (ESA 2010).

INDICATOR C.29	
Indicator Name	**Forest and other wooded land (FOWL)**
Type of indicator	**Sectorial**
Definition	The indicator shows **the area of forest and other wooded land (FOWL).** **It consists of 2 sub-indicators:** 1**. area of FOWL** 2. **share of FOWL in the total area** The indicator provides a frame of reference for European forest resources. Forest is defined as "Land spanning more than 0.5 ha with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use". Moreover: Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 meters in situ. Forest includes: - areas with young trees that have not yet reached but which are expected to reach a canopy cover of 10 percent and tree height of 5 meters. It also includes areas that are temporarily unstocked due to clearcutting as part of a forest management practice or natural disasters, and which are expected to be regenerated within 5 years. Local conditions may, in exceptional cases, justify that a longer time frame is used. - forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific environmental, scientific, historical, cultural or spiritual interest. - windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 ha and width of more than 20 meters. - abandoned shifting cultivation land with a regeneration of trees that have, or is expected to reach, a canopy cover of 10 percent and tree height of 5 meters. - areas with mangroves in tidal zones, regardless whether this area is classified as land area or not. - rubber-wood, cork oak, energy wood and Christmas tree plantations. - with bamboo and palms provided that land use, height and canopy cover criteria are met. Forest excludes tree stands in agricultural production systems, such as fruit tree plantations (incl. olive orchards) and agroforestry systems when crops are grown under tree cover. Note: Some agroforestry systems where crops are grown only during the first years of the forest rotation should be classified as forest (*Source*: Forest Resources Assessment, 2010, modified). Other wooded land (OWL) is defined as "Land not classified as "Forest", spanning more than 0.5 ha; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use. Moreover, the definition above has two options: a) The canopy cover of trees is between 5 and 10 percent; trees should be higher than 5 meters or able to reach 5 meters *in situ*, or b) The canopy cover of trees is less than 5 percent, but the combined cover of shrubs, bushes and trees is more than 10 percent. Includes areas of shrubs and bushes where no trees are present. OWL includes:

	• areas with trees that will not reach a height of 5 meters *in situ* and with a canopy cover of 10 percent or more, e.g., some alpine tree vegetation types, arid zone mangroves, etc. • areas with bamboo and palms provided that land use, height and canopy cover criteria are met (*Source*: Forest Resources Assessment, 2010). For terms and definitions see also the following document: www.unece.org/fileadmin/DAM/timber/soef/Definitions_Quantitative_indicators_for_website.pdf
Unit of measurement	1: 1000 ha 2: % of total land
Data source	Primary source: FOREST EUROPE, UNECE and FAO enquiry on pan-European quantitative indicators **State of Europe's Forests Report** (www.unece.org/forests/fr/outputs/soef2011.html) Eurostat, Forestry statistics
References/locati on of the data	Data availability at present: State of Europe's Forests Report (SoEF), 2011, Indicator 1.1, Forest area, Table A1.2: Extent of forest and other wooded land, 2010 (www.unece.org/forests/fr/outputs/soef2011.html). Data are also available in Eurostat database, Forestry statistics: • FOWL: Table: for_area • Total area: table demo_r_d3area
Data collection level	National (NUTS 0).
Frequency	Every 5 years (e.g., 2010, 2015).
Delay	1 year (e.g., data of 2015 available in 2016).
Comments /caveats	For Croatia, Eurostat reports no figure for total area; land area was used to fill the gap. Last available year is 2015.

INDICATOR C.30	
Indicator Name	**Tourism infrastructure**
Type of indicator	**Sectorial**
Definition	Tourism infrastructure in rural areas is measured as **the number of bed places in tourist accommodations.** **It consists of 2 sub-indicators:** 1**. total bed places** 2. **distribution of bed places by degree of urbanisation**
Unit of measurement	1. total number of bed places 2. share of national total
Data source	Eurostat – Tourism statistics According to Regulation (EU) 692/2011 of the European Parliament and of the Council, the data is available from 2012 onwards.
References/location of the data	For national data: table tour_cap_natd For regional data: table tour_cap_nuts2d
Data collection level	EU, national (NUTS 0) and regional (NUTS 1 and 2)
Frequency	Annual and monthly. Annual for regional data.
Delay	1 year
Comments/caveats	Collective tourist accommodation establishments include hotels, holiday and other short-stay accommodation, camping grounds, recreational vehicle parks and trailer parks (NACE r.2 divisions I551-I553). When the number of bed places in one category of establishment is missing, the sum of available data is provided. The number of bed places in an establishment or dwelling is determined by the number of persons who can stay overnight in the beds set up in the establishment (dwelling), ignoring any extra beds that may be set up by customer request. The term bed place applies to a single bed, double bed being counted as two bed places. The unit serves to measure the capacity of any type of accommodation. A bed place is also a place on a pitch or in a boat on a mooring to accommodate one person. One camping pitch should equal four bed places if the actual number of bed places is not known.

| INDICATOR C.31	
Indicator Name	**Land Cover**
Type of indicator	**Environment**
Definition	The indicator measures the **area in the different categories of land cover.** It consists of 6 sub-indicators: 1. **agricultural area** 2. **natural grassland** 3**. forest area** 4**. transitional woodland-shrub** 5. **semi-natural area** 6. **wetlands and water bodies** Land cover is the actual distribution of forests, water, desert, grassland and other physical features of the land, including those created by human activities. Land use, on the other hand, characterises the human use of a land cover type. The data source used is CORINE Land Cover (CLC). CLC databases are obtained through computer-assisted interpretation of satellite images acquired in 1990, 2000, 2006, 2012 and 2018 offering the possibility to describe the geographic distribution of specific land cover changes in a geo-referenced approach. CLC describes land cover (and partly land use) with a three-level nomenclature of 44 classes. For the purpose of this indicator, they have been grouped so as to obtain the four classes of agricultural, forest, natural and artificial land cover. CLC was elaborated based on the visual interpretation of satellite images (IRS, RapidEye, Spot, Landsat TM and MSS). Ancillary data (aerial photographs, topographic or vegetation maps, statistics, local knowledge) is used to refine interpretation and assign classes. The CLC database is based on a standard production methodology characterised by the following elements: Mapping scale is 1:100 000. Mapping accuracy is 100 m. The minimum mapping unit for the inventory is 25 ha for areas, and 100 m for linear elements. It should be noted that other sources may give significantly different results, but CLC has a uniform methodology and nomenclature across Europe. Nevertheless, in order to reduce and explain the discrepancies with other surveys and national inventories, the estimation of agricultural areas and forest includes separately the CLC classes "Natural grassland" and "Transitional woodland –shrubs", which are, in most cases, likely to be critical in the estimation.
Unit of measurement	1-6: share of total area
Data source	CORINE Land Cover (CLC) 2018
References/location of the data	European Environment Agency https://www.eea.europa.eu/data-and-maps/data/copernicus-land-monitoring-service-corine https://land.copernicus.eu/pan-european/corine-land-cover/clc2018 https://land.copernicus.eu/pan-european/corine-land-cover/lcc-2012-2018
Data collection level	National Regional (NUTS 2).

Frequency	CORINE Land Cover: 6 years
Delay	CORINE Land Cover: 3 years
Comments/caveats	CLC classes used are, by sub-indicator: 1: CLC class 1 2: CLC class 2 3: CLC class 3 4: CLC class 4 5: CLC class 5 6: CLC class 6

Indicator Name	**Areas facing natural and other specific constraints - ANCs[6]**
Type of indicator	**Environment**
Definition	The characterisation of agricultural areas designated as areas facing natural or other specific constraints provides useful information on the environment in which the policy is implemented. The indicator measures the **share of agricultural area in 3 different categories of areas facing natural or other specific constraints (ANCs)** (ex-LFAs as they were defined in the period 2007-2013): 1. Mountain areas (incl. areas north of the 62nd parallel) (ex-LFA mountain); 2. Areas, other than mountain areas, facing significant natural constraints (ex-LFA intermediate); 3. Other areas affected by specific constraints (ex-LFA specific). Article 32 of Regulation (EU) No 1305/2013 defines the areas facing natural or other specific constraints, which are eligible for payments to farmers, if such payments are foreseen in the respective Member State or Region (under pillar I or pillar II). The designation of such areas can also be used as criterion for an increase of the support rate for investments in physical assets under pillar II. They are classified according to three categories, each of which describes a specific cluster of natural or other specific constraints affecting agricultural production in the area concerned: 4. Mountain areas (incl. areas north of the 62nd parallel) according to Art. 32 (1a) (ex-LFA mountain); 5. Areas, other than mountain areas, facing significant natural constraints according to Art. 32 (1b) (ex-LFA intermediate); 6. Other areas affected by specific constraints according to Art. 32 (1c) (ex-LFA specific). The area designations and other requirements for ANCs have changed in comparison to the programming period 2007-2013 and to Regulation (EC) No 1698/2005 and Regulation (EC) No 1257/99, which are repealed. While no revision of the designation of mountain areas or areas affected by specific constraints is foreseen in Regulation (EU) No 1305/2013 (but remains nevertheless possible), areas facing natural constraints other than mountain (former LFA intermediate) should be delimited according to eight biophysical criteria, as defined in Annex III of Regulation (EU) No 1305/2013, covering climate, poor soil productivity and steep slopes. Each (sub)criterion has a predefined threshold, e.g. slopes with a gradient of 15% (or more), which identifies the trigger for the area to be considered as severely constrained from the agricultural production point of view. Measurement of constraint(s) takes place at the level of Local Administrative Units (LAU) 2 (which corresponds to municipality level in most Member States) or at the level of clearly delineated, contiguous local units. The latter should have a definable economic and administrative identity. Farming in the respective local unit can be considered as being constrained if constraints are present on at least 60 % of the local unit's agricultural area. The legislation also stipulates the mechanism of fine-tuning, which aims to exclude those administrative units where a constraint has been documented but it has been overcome by investments or by economic activity. The mandatory fine-tuning exercise is a part of the designation exercise. There is also the possibility to apply a combination of the biophysical criteria listed in Annex III of Regulation (EU) No 1305/2013 for the designation of areas affected by specific constraints (Article 32(4)), followed by a mandatory fine-tuning. In any case, the total extent of areas affected by specific constraints shall not exceed 10% of the area of the Member State concerned.

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[6] According to the COMMISSION IMPLEMENTING REGULATION (EU) No 808/2014 this indicator is called "Less-favoured areas"

	New data on ANCs are reported by Member States within the programming period 2014-2020.
Unit of measurement	1-3: share of the utilised agricultural area (UAA)
Data source	DG Agriculture and Rural Development: data are reported by Member States during the programming period 2014-2020.
References/location of the data	DG Agriculture and Rural Development on request. Total UAA: Eurostat, table [apro_cpsh1]
Data collection level	National, regional. Areas facing natural constraints, other than mountain: Data are reported at the level of LAU2 or another LAU (a number of Member States use different administrative units for the delimitation of these areas). Areas affected by specific constraints: Data collection may be carried out at the level of area designation. In case the designation is carried out according to the "combination of biophysical criteria", as defined in the third paragraph of Article 32(4) of Regulation (EU) No 1305/2013, the data collection level should be LAU2 or another clearly delineated local unit.
Frequency	On ANC areas last update on 2018. If not updated, data refer to LFAs are from 2005 (and from 2007 in the case of BG).
Delay	
Comments/caveats	Depending on the administrative unit used for the delimitation of the areas with constraints, the map at EU level may show bigger areas than the respective maps provided by Member States. This is due to the fact that the EU map is consistently set up at LAU2 level, whereas a number of Member States use lower administrative units for the designation. The respective LAU2 units are indicated as 'partially' and striped in the colours of the categories they encompass. Member States need to complete the delimitation of the ANCs other than mountain in 2019 at the latest in order to be used as criteria for respective payments to farmers or higher support rates. Meanwhile, the previous area designations stay in force. In case of no new designation in 2019 or later designation, the former LFA intermediate category might be eligible for phasing-out payments until 2020 at the latest (Article 31 (5) of Regulation (EU) No 1305/2013, if programmed in the respective rural development program and is therefore still indicated in the table of C.32 and in the map.

INDICATOR C.33	
Indicator Name	**Farming intensity**
Type of indicator	**Environment**
Definition	This indicator consists of 2 sub-indicators: 1. **Farm input intensity** 2. **Areas of extensive grazing** **1. Farm input intensity** is expressed as the **utilised agricultural area (UAA) managed by farms with low, medium and high input intensity, as percentage of total UAA.** The input intensity of a farm can be defined as the level of inputs used by the farm per unit of production factor (in general land). Intensification is defined as the increase in farm intensity, while extensification describes the opposite trend. Farms are classified into intensity categories according to an estimate of input volume per hectare of UAA. The inputs considered are fertilizers, pesticides, other crop protection products and purchased feed. This approach allows covering both crop and livestock productions. The volume of inputs used (per hectare) is estimated by dividing input expenditures (per hectare) by the input price index for the year and country in question. This results in input expenditures per hectare in constant national input prices. Fertiliser expenditure (purchased fertilisers and soil improvers) is divided by the fertiliser price index in the country of the same year in order to estimate the volume used. Similarly, crop protection expenditure (plant protection products, traps and baits, bird scares, anti-hail shells, frost protection) is divided by the pesticide price index in the country of the same year. Purchased feed cost is also divided by the feed price index in the country of the same year. The result is thus expressed in constant inputs prices (Euro per ha). The method allows not only to deduct inflation, but also the fluctuation of input prices. Thus it estimates the trend in the volume of inputs used per hectare. However, it does not capture differences in input prices between countries and the differences in prices within each category of inputs (for example between a pesticide A and a pesticide B). Therefore it does not give the exact volume of inputs used for a specific country and year. In a second step, the distribution of the UAA is considered by the ranked input intensity (bivariate approach) in each geographical level (EU, MS, NUTS) for the specific year of reference (2010 for all MSs, 2013 for HR). Three classes of intensity (low, medium, high) are then defined, by deriving the associated level of input corresponding to the 33rd (q33) and the 66th (q66) UAA quantiles. A farm is classified under the class "low intensity" if its input level is below or equal to the intensity value associated to the Q33 of UAA (see, as an example, the graph below: 91 euros/ ha for AT - 2010). A farm is classified under the class "high intensity" if its input level is greater than the intensity value associated to the Q66 of UAA (in the graph below: 247 euros/ ha for AT 2010). A farm is classified under the class "medium intensity" if its input level is greater than the intensity value associated to the Q33 of UAA and it is below the intensity value associated to the Q66 of UAA. For EU28, as well as for EU27_2020, those thresholds are represented by 88 euros/ha for low intensity farms, by 560 euros/ha for high intensity farms, and by between 88 and 560 euros/ha for medium intensity farms.
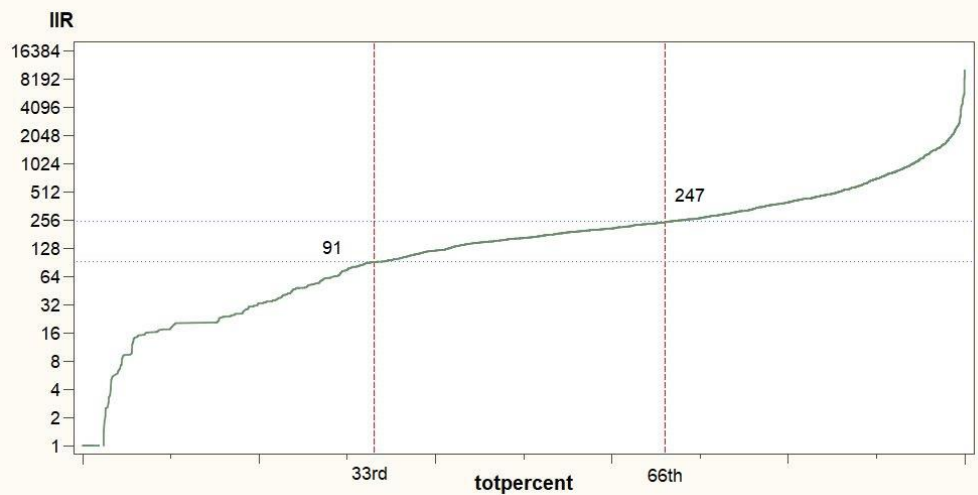
These levels should not be considered as strict cut-off values, but rather as reference in time in order to be able to study the evolution of farm intensification through the years.

Once the farms are classified in one of the three intensity classes (low, med, high), a global ratio indicator is computed as the weighted sum of input over the weighted sum of UAA for each intensity class.

Intensification in a country with very low intensity does not mean the same for the environment than intensification in a country with high intensity. That is the purpose of the variable, "average input expenditures per hectare in constant input prices". It is not the ideal measurement of intensity; however, it is the best estimate that we can obtain until now from the available data.

The methodology for the calculation of this indicator is applied as well to the agri-environmental indicator 12 "intensification/extensification":

http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicators

2. Areas of extensive grazing measures the **area under grazing livestock production (cattle, sheep and goats), where the stocking density does not exceed 1 livestock unit per ha of forage area (forage crops, permanent pastures and meadows), as share of the total UAA.**

For each region (NUTS 2), the livestock density per ha of forage UAA (fodder crops + permanent grassland) is calculated. If the livestock density is less than 1 LU/ha the regions is classified as extensive; if it is more than 1 LU/ha, the regions is classified as intensive. Then the share of forage UAA in total UAA for each "extensive" NUTS 2 is calculated.

In each region the following information is needed:

- total UAA, UAA used for fodder crops and UAA for permanent grassland;

- numbers of grazing livestock (bovine by sex and age, sheep, goats) in LU;

Since the evaluation of the extensive character of agriculture should be made at the most detailed geographical level possible, the extensive character of agriculture at Member State level is determined by aggregating values at NUTS 2 level.

Unit of measurement	1. % of total UAA. (The variable "average level of intensity" per country or region is expressed in "Euro per ha in constant input prices"). 2. ha and % of total UAA
Data source	1. Farming intensity

	- DG AGRI - Farm Accountancy Data Network (FADN) - Eurostat - Price indices of the means of agricultural production, input. 2. Eurostat - Farm structure survey (FSS).
References/location of the data	1. Farming intensity - DG AGRI - Farm Accountancy Data Network (FADN). Name of current variables defined in the FADN: SE295 Fertilizers; SE300 Crop protection; F64 to F67 Purchased feedstuffings, SE025 Utilised Agricultural Area: http://ec.europa.eu/agriculture/rica/; https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp - Eurostat - Price indices of the means of agricultural production, input (2010 = 100) - annual data (apripi10ina). Products: 203000 - FERTILISERS AND SOIL IMPROVERS, 204000 - PLANT PROTECTION PRODUCTS AND PESTICIDES, 206000 - ANIMAL FEEDINGSTUFFS. 2. Areas of extensive grazing - Eurostat - Farm structure survey (FSS), Tables: Crops by classes of utilised agricultural area in number of farms and hectare by NUTS 2 regions [ef_lus_allcrops]; Bovine animals by NUTS 2 regions [ef_lsk_bovine], Sheep by NUTS 2 regions [ef_lsk_sheep], Main livestock indicators by NUTS 2 regions, live goats [ef_lsk_main].
Data collection level	1. National (NUTS 0), regional (NUTS 2); primary data refer to FADN regions. 2. National (NUTS 0), regional (NUTS 2)
Frequency	1. Annual 2. FSS: full census every 10 years, intermediate survey 2-3 times in-between.
Delay	1. 2 years 2. 3 years
Comments/caveats	2. Areas of extensive grazing: For DE, CY data at NUTS2 level are not available at the date of this update, therefore, according to the methodology, it is not possible to derive the information on the extensive area.

Indicator Name	**Natura 2000 areas**
Type of indicator	**Environment**
Definition	The indicator provides information on the area protected under Natura 2000 that is used for agriculture and/or forestry. This indicator consists of 3 sub-indicators: 1. **share of territory under Natura 2000 by categories** (Special Protection Areas - SPAs, Sites of Community Importance - SCIs, Natura 2000's network) 2. **share of UAA under Natura 2000** (agricultural area, agricultural area including natural grassland) 3. **share of forest area under Natura 2000** (forest area, forest area including transitional woodland-shrub) This indicator provides information on the preservation of the natural environment and landscape and on the protection and improvement of natural resources. Under Natura 2000, a network of areas is designated to conserve natural habitats and species of wildlife which are rare, endangered or vulnerable in the European Union. The Natura 2000 network consists of sites: • designated by Member States as Special Protection Areas (SPA) under the Birds Directive (Council Directive 79/409/EEC of 2 April 1979), • proposed by Member States as Sites of Community Importance (pSCI) and later designated as Special Areas of Conservation (SAC) under the Habitats Directive (Council Directive 92/43/EEC of 21 May 1992). For the Special Protection Areas designated under the Birds Directive, the responsibility for designation lies entirely with the Member States. The Commission (DG Environment) has to be informed when new areas are designated or existing areas are modified. The information received on new or revised areas is passed on to the European Environment Agency (EEA), which regularly produces consolidated versions of the SPA database for the whole EU. For the proposed Sites of Community Importance, which will in the future be Special Areas of Conservation under the Habitats Directive, there is a three-stage process that starts with a proposal by Member States. The proposals are transferred to the Commission, which evaluates with the European Topic Centre on Biological Diversity (ETC_BD) whether or not the proposed sites ensure sufficient protection and, on the basis of that evaluation, asks the Member States to propose more sites whenever necessary. The EEA regularly (once a year) compiles all the information received into a single EU database. The lists of sites foreseen in the Habitats Directive are divided into nine bio-geographic regions (Pannonian, Boreal, Continental, Atlantic, Alpine, Macaronesian, Black Sea, Steppic and Mediterranean) within the territory of the Union. The first list for the Macaronesian region was agreed in December 2001. The second list was adopted in December 2003 for the Alpine region, followed in 2004 by the lists for the Continental and Atlantic regions. The list for the Boreal region was adopted in 2005, and the list for the Mediterranean region in 2006. The lists for the Steppic and the Black Sea regions were adopted in 2008. Natura 2000 sites include different types of European ecosystems. Some sites are in coastal areas or in open marine waters, some contain lakes or are riverine, and many include forest and farmland. For calculating an improved version of this indicator, geo-referenced information is required. The data sets used consist of the Natura 2000 Spatial Dataset and the CORINE Land Cover (CLC) raster dataset. Although CLC categories do not fully correspond to the statistical definitions of agricultural area (UAA) or forests, the overlay of the two data sets allows an accurate geographical estimation of land use data inside Natura 2000 sites. To reduce and explain the discrepancies with other surveys and national inventories, the estimation of the UAA and forest includes separately the CLC classes "Natural grassland" and "Transitional woodland –shrubs".

	CLC classes used are:
	- Agricultural area: CLC 2
	- Agricultural area including natural grassland: CLC 2+ 321
	- Forest area : CLC 3
	- Forest area including transitional woodland-shrub: CLC3 +324
Unit of measurement	1-3: % of area under Natura 2000
Data source	1: Natura 2000 Barometer Statistics Report (release version End2018 – 15/03/2019)
	2-3: CORINE Land Cover (CLC) 2018
References/location of the data	Natura 2000 Barometer statistics
	https://www.eea.europa.eu/data-and-maps/dashboards/natura-2000-barometer
	Natura 2000 data - the European network of protected site
	https://www.eea.europa.eu/data-and-maps/figures/natura-2000-birds-and-habitat-directives-8
	CORINE Land Cover (CLC) 2018
	https://land.copernicus.eu/pan-european/corine-land-cover/clc2018?tab=download
Data collection level	Regional (NUTS 2).
Frequency	Natura 2000: every year
	CORINE Land Cover: depending on the frequency foreseen in the new CLC+ (see https://www.copernicus.eu/sites/default/files/2019-01/Copernicus_Work_Programme_2019.pdf
Delay	Natura 2000: 1 year
	CORINE Land Cover: 1,5 years.
Comments/caveats	

INDICATOR C.35	
Indicator Name	**Farmland birds index (FBI)**
Type of indicator	**Environment**
Definition (Exact definition in bold, description of the measurement/calculation, sub-indicators in bold if relevant).	The farmland bird indicator is intended as proxy to assess the biodiversity status of agricultural landscapes in Europe. Birds are high in the food chain and therefore are considered good indicators for the overall state of biodiversity. The indicator is **a composite index that measures the rate of change in the relative abundance of common bird species at selected sites.** These species, chosen from a list of selected common species at EU level (the so-called "EU list of species" currently cover 39 species[7]), are dependent on farmland for feeding and nesting and are not able to thrive in other habitats. The species on the list constitute a maximum, from which the countries select the species relevant to them. However, Member States can select their own species set, ideally following guidelines from the European Bird Census Council (EBCC). No rare species are included in EU species selection. Population trends are derived from the counts of individual bird species at census sites and modeled as such through time. The population counts are carried out by a network of volunteer ornithologists coordinated within national schemes. Indices are first calculated for each species independently at the national level by producing a national population index per species. Then, to produce the EU aggregate, the national species indices are combined into supranational ones. To do this, they are weighted by estimates of national population sizes. Weighting allows for the fact that different countries hold different proportions of the European population of each species. In a third step, the supranational indices for each species are then combined on a geometric scale to create a multi-species aggregate index at European level. For more detailed information on the methodology used, species, etc. please refer to the EBCC website http://www.ebcc.info/ and the Eurostat indicator metadata. The index is calculated with reference to a base year, when the index value is set at 100%. Trend values express the overall population change over a period of years. (In Eurostat's database, data are presented with four different bases: 1990, 2000, the latest year available and the national base year). Data going back to the 1980s however exist and are available at the EBCC website. The indicator already exists: o Agro-environmental indicator (AEI) 25: Population trends of farmland birds; o Sustainable development indicators (SDI) – Biodiversity: Common Birds Index (Eurostat). o SEBI indicator 01: abundance and distribution of selected species, which includes common farmland bird index (Pan-European Streamlining European Biodiversity Indicators (SEBI) initiative, European Environment Agency (EEA), Directorate-General Environment (DG ENV), etc.)
Unit of measurement	Index - (base year 2000 = 100)
Data source	EBCC/RSPB/BirdLife/Statistics Netherlands: the European Bird Census Council (EBCC) and its Pan-European Common Bird Monitoring Scheme (PECBMS), http://www.ebcc.info/pecbm.html . Data are transmitted to Eurostat and published in the statistics database: Environment/Biodiversity. Eurostat does not receive any of these data directly from the Member States.

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[7] 2014 update

	National indices are compiled by each country using common software and methodology. The supranational indices are compiled by the Pan-European Common Bird Monitoring scheme (PECBM), a joint project of the European Bird Census Council, the Royal Society for the protection of Birds, BirdLife International, and Statistics Netherlands.
References/location of the data	Eurostat, Environment statistics, Biodiversity: Table [env_bio2]: national farmland bird index. Table [env_bio3]: EU farmland bird index (EU28 and EU27_2020).
Data collection level	National EU level aggregation
Frequency	Annual (In principle, these data are updated on a yearly basis at national and EU level. Ability to provide updates of indicators at national level depends on the capacity of the national data providers). Data availability 2019: 2017 national data Common farmland bird index, EU aggregates Common farmland species 2016. For a small number of Member States data are available from 1980 and cover different periods depending on data availability in each Member State.
Delay	2-3 years
Comments/caveats	The relation between agricultural activities and farmland bird populations should be interpreted very cautiously. There is abundant literature on the impact of agricultural activities on farmland birds, but there are many other factors affecting the status of their populations, and the relative importance of these factors along time is not well understood. Comparability between Member States is possible since the index gives a measure of the rate of change in the abundance of common bird species. Species may differ in each Member State because their relevance changes in different agricultural habitats and their geographical distribution is not pan-European. Northern countries generally have fewer species than southern ones. The index can be estimated at national and EU level. Downscaling at regional (NUTS 2) level is currently not possible. The main limiting factor is the insufficient number and spatial heterogeneity of sampling units. In Eurostat's database, data are presented with four different bases: 1990, 2000, the latest year available and the national base year.

INDICATOR C.36	
Indicator Name	**Conservation status of agricultural habitats (grassland)**
Type of indicator	**Environment**
Definition	The indicator shows **the conservation status of agricultural habitats (grassland)** and it measures **the percentage of assessments of agricultural habitats (grassland) that have a favourable, unfavourable-inadequate and unfavourable-bad conservation status.** It will be used to assess changes in the conservation status of European grassland ecosystems. The indicator is based on data collected according to monitoring obligations under Article 11 of the Habitats Directive (92/43/EEC) and is therefore part of the indicator "Habitat types of European interest" (SEBI indicator 05). It is important to note that Article 11 monitoring is not limited to the Natura 2000 network, but covers the entire European territory of the EU Member States. The indicator covers a set of habitat types (listed in Annex I of the Habitats Directive) which are considered to be of European interest that are linked to agro- and grassland ecosystems. This set comprises: - habitats which are in danger of disappearance in their natural range; - habitats that have a small natural range following their regression or by reason of their intrinsically restricted area; - habitats which present outstanding examples of typical characteristics of one or more of the biogeographical regions' (Article 1 of the Habitats Directive). Trends in this indicator should primarily be influenced by the implementation of measures under the Habitats Directive, such as the establishment of the Natura 2000 Network and habitats and species protection measures. Therefore the indicator reflects progress achieved by the Habitats Directive, one of the main legislative pillars of EU nature conservation policy. EU Member States have to monitor and report the conservation status of habitats of European interest. Habitat types in agro- and grassland ecosystems, which are significant are also individually monitored (e.g. certain types of species-rich grasslands, pastures, moors and heathlands, wetlands). The conservation status is illustrated in three 'traffic light' categories ('favourable' – green, 'unfavourable inadequate' – amber, 'unfavourable bad' – red, plus unknown) characterised by four parameters: - trends and status of range, - trends and status of the area, - structure and function including typical species, - future prospects. The indicator is consisting in 4 sub-indicators, based on the number of habitats in the different conservation status categories: 1 - percentage of grassland types assessed as being in "Favourable" conditions in the total grassland 2- percentage of grassland types assessed as being in "Unfavourable-inadequate" conditions in the total grassland 3- percentage of grassland types assessed as being in "Unfavourable-bad" conditions in the total grassland 4 - percentage of grassland types assessed as being in "Unknown" conditions in the total grassland

	The indicator will enable an assessment of the level of ambition of the Natura 2000 measures proposed by Member States in the Rural Development focus area on biodiversity. The information is complementary to the Farmland Bird Index, which is not an indicator of habitats and only focused on common birds. Two "greening" measures of pillar 1 (the Ecological Focus Area (EFA) and the grassland conservation measure) as well as certain cross compliance provisions are complementary key elements which contribute to the improvement of the grassland conservation status.
Unit of measurement	For each type of assessment: - % of total assessments of habitats
Data source	EEA, CLC 2018 (extraction on demand)
References /location of the data	Member State level: https://www.eea.europa.eu/data-and-maps/data/article-17-database-habitats-directive-92-43-eec-1 Conservation Status by Member State and biogeographical region for each species: https://nature-art17.eionet.europa.eu/article17/habitat/report/?period=5&group=Grasslands&country=
Data collection level	National level. NUTS2 level.
Frequency	Every 6 years
Delay	2-3 years
Comments/caveats	

INDICATOR C.37	
Indicator Name	**HNV (high nature value) farming**
Type of indicator	**Environment**
Definition	This indicator is defined as the p**ercentage of Utilised Agricultural Area farmed to generate High Nature Value**.

High Nature Value (HNV) farming results from a combination of land use and farming systems which are related to high levels of biodiversity or the presence of certain species and habitats.

The common definition established *inter alia* by the EEA and JRC, recognises three categories of farmland as HNV:

Type 1: Farmland with a high proportion of semi-natural vegetation

Type 2: Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers etc

Type 3: Farmland supporting rare species or a high proportion of European or world populations.

This indicator is a further development of AEI 23 "High Nature Value Farmland", and the farmland component of the 2007-2013 CMEF Baseline indicator 18 "High Nature Value farmland and forestry".

Methodology:

For the purposes of this indicator, the common parameter "HNV farming", as defined above, is to be assessed within each Member State and individual RDP area using methods suited to the prevailing bio-physical characteristics and farming systems, and based on the highest quality and most appropriate data available. The Member State authorities are responsible for conducting this assessment and providing the values to the Commission.

Methodological guidance for establishing values for this indicator has been provided in "The application of the High Nature Value impact indicator" Evaluation Expert Network (2009) : http://enrd.ec.europa.eu/app_templates/filedownload.cfm?id=6A6B5D2F-ADF1-0210-3AC3-AD86DFF73554

Several Member States raised the issue of comparability and/or aggregation if different methodologies are used. Agreement on the common parameter being measured, and transparency and acceptance of the various methodologies, whilst not ideal, allows for aggregation, since in all areas the land considered to fulfil the criteria for one of the three HNV types is assessed, provided that Member States have selected methodology appropriate to identifying HNV in their biophysical situation.

The purpose of this indicator is not to make comparisons between territories on the basis of the extent of HNV land, but rather to consider the trends in its preservation and /or enhancement. It is therefore important that in each territory the same methodology is used for each successive assessment, so that trends are estimated correctly.

When more accurate methods are developed, leading to a change in the methodology used, HNV assessments should be recalculated for the baseline year to ensure that the trend can be captured. If this is not possible, then the new methodology should be used alongside the old to allow trends to be assessed. |
| **Unit of measurement** | Percentage (%)

The absolute area of utilised agricultural area (UAA) in hectares, and of HNV farmland, is also required, to allow for aggregation to Member State/EU level. |

Data source	The data sources for estimation of HNV farming are many and varied, and currently depend on the methods selected by the Member State authorities. Analysis relies principally on national/regional data, but also includes use of some EU data sets. Sources include: CORINE and other land cover data, IACS/LPIS, agricultural census data, species and habitat databases, GIS, specific sampling surveys, RDP monitoring data, designations (NATURA, national nature reserves etc.).
References/location of the data	For assessment of HNV farmland national/regional data are required (see above) UAA: EUROSTAT FSS national and regional data
Data collection level	The indicator should be established at either national, NUTS 1 or NUTS 2 level. Values should be obtained which correspond to RDP territory level. Large Member States may consider it appropriate to have a regional assessment, particularly where there are large regional variations in climate, topography, biodiversity, landscape and/or farming patterns. The level at which the data is available varies with the data source (see description above).
Frequency	Variable. Minimum requirement is 3 times between 2013 and 2022: a baseline assessment at the start of the 2014-2020 period (ideally for 2012 or 2013), an assessment at the end of the period (to coincide with the ex-post evaluation of the RDP territory), and one update during the period (ideally for 2017 or 2018).
Delay	Variable (depends on the data sources used, frequency of surveys/sampling, etc.).
Comments/caveats	Due to the variation in data availability, physical/ecological situation and farming systems and practices across Member States, it is not appropriate to impose a common methodology for the assessment of HNV farming. Use of one single method would restrict the analysis to data available throughout the EU, which would exclude the richest and most relevant data sources, and preclude those Member States which have developed more refined methods from using them, with a consequent reduction in the quality and accuracy of the assessment. A full assessment of HNV farming would consider both extent and quality/condition. The indicator definition proposed here only covers the extent of HNV areas, since in most Member States current methodology is not sufficiently developed to provide reliable indications of the condition of HNV areas. However, Member States are strongly encouraged to continue developing and refining the approaches used so that quality/condition can be incorporated into HNV assessments. Additional information on HNV farming throughout the EU is available in the recently published book "High Nature Value Farming in Europe". The Directorate-General Environment (DG ENV) study on "The High Nature Value farming concept throughout EU 27 and its maturity for financial support under the CAP" (starting October 2012) may also provide further information on assessment methodologies which could be a support to Member States. As for all other indicators, it is necessary to have an estimated value for this indicator for all Member States. Until an appropriate specific method for estimating HNV is identified and used by the Member State authorities, there are two existing sources of data which could be used in the interim to provide a value, although both have considerable limitations and do not give a representative assessment of the extent of HNV. Use of these values is a second-best alternative compared to use of a more accurate and appropriate method. These data sources are mentioned here solely to provide an initial fall-back option in cases where a Member State has not yet made sufficient progress to be able to provide more accurate starting values based on more appropriate and specific data and methods. The two fall-back options are: 1) Estimation of HNV farmland from CORINE land cover data (EEA study) Limitations:

	- This approach does not take account of farming systems.
	- Land cover assessments do not always distinguish well between abandoned land with encroaching scrub, and extensive semi-natural grassland with patches of bushes or scattered trees.
	- The scale used may mean that smaller areas, such as agricultural parcels within wooded areas are missed completely.
	- The area of agricultural land estimated from CORINE land cover data does not correspond to EUROSTAT's UAA data.
	- The EEA exercise is not updated regularly, so it does not provide a dynamic picture.
	2) Area of UAA contained within designated NATURA 2000 sites. Limitations:
	- This approach does not take account of farming systems.
	- It is static rather than dynamic.
	- It underestimates the extent of HNV since it primarily addresses only Type 3 HNV farmland rather than all 3 types.

INDICATOR C.38	
Indicator Name	**Protected forest**
Type of indicator	**Environment**
Definition	Protected forests are important to maintain and enhance biodiversity, as well as to conserve landscapes and provide recreation opportunities (SoEF, 2011). The indicator measures the **share of forest and other wooded land (FOWL) protected to conserve biodiversity, landscapes and specific natural elements** according to MCPFE[8] Assessment Guidelines (MCPFE classes 1.1, 1.2, 1.3 and 2). The indicator consists of 4 sub-indicators: 1. share of FOWL area in class 1.1 2. share of FOWL area in class 1.2 1. share of FOWL area in class 1.3 1.share of FOWL area in class 2 "Protected areas are one of the oldest instruments for protecting nature and natural resources, and are included as a main pillar in nature conservation laws across Europe. Explicitly designated protected areas focus mainly on conserving biological diversity, landscape, natural monuments and protective functions of forests. The MCPFE Assessment Guidelines for Protected and Protective Forest and Other Wooded Land in Europe were created in 2001-2003 especially for European countries where protected forest areas are often small, most of which are located in fragmented landscapes with other land use categories and are protected with various management options and regimes" (SoEF, 2011) Protected and protective[9] forest and other wooded land have to comply with the following general principles according to the MCPFE Assessment Guidelines: • Existence of legal basis • Long-term commitment (minimum 20 years) • Explicit designation for the protection of biodiversity, landscapes and specific natural elements (MCPFE Assessment Guidelines, 2002) MCPFE Classes *for 'Protected FOWL to conserve biodiversity, landscapes and specific natural elements'* are defined by the MCPFE Assessment Guidelines for Protected and Protective Forest and Other Wooded Land in Europe (Fourth MCPFE, Vienna 2003). https://foresteurope.org/state-of-europes-forests/ *Class 1: Main Management Objective "Biodiversity":* *Class 1.1: "No Active Intervention":* - *The main management objective is biodiversity* - *No active, direct human intervention is taking place* - *Activities other than limited public access and non-destructive research not detrimental to the management objective are prevented in the protected area* *Class 1.2: "Minimum Intervention":* - *The main management objective is biodiversity*

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[8] The Ministerial Conference on the Protection of Forests in Europe has changed its name from MCPFE to FOREST EUROPE
[9] "Protective forests" under MCPFE class 3, designated to protect soil and its property or water quality and quantity or other forest ecosystem functions, or to protect infrastructure and managed natural resources against natural hazards, are not considered in this indicator.

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Human intervention is limited to a minimum
Activities other than listed below are prevented in the protected area: Ungulate/game control/Control of diseases/insect outbreaks, Public access, Fire intervention, Non-destructive research not detrimental to the management objective, Subsistence resource use (In case of expected large diseases/insect outbreaks control measures using biological methods are allowed provided that no other adequate control possibilities in buffer zones are feasible. Subsistence resource use to cover the needs of indigenous people and local communities, in so far as it will not adversely affect the objectives of management).

Class 1.3: "Conservation Through Active Management"

The main management objective is biodiversity
A management with active interventions directed to achieve the specific conservation goal of the protected area is taking place
Any resource extraction, harvesting, silvicultural measures detrimental to the management objective as well as other activities negatively affecting the conservation goal are prevented in the protected area

Class 2: Main Management Objective "Protection of Landscapes and Specific Natural Elements"

Interventions are clearly directed to achieve the management goals landscape diversity, cultural, aesthetic, spiritual and historical values, recreation, specific natural elements
The use of forest resources is restricted
A clear long-term commitment and an explicit designation as specific protection regime defining a limited area is existing
Activities negatively affecting characteristics of landscapes or/and specific natural elements mentioned are prevented in the protected area

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<tr>
<td>Unit of measurement</td>
<td>% of FOWL area protected under each MCPFE classes: 1.1, 1.2, 1.3, 2.</td>
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<tr>
<td>Data source</td>
<td>FOREST EUROPE, UNECE and FAO enquiry on pan-European quantitative indicators: State of Europe's Forests Report</td>
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<tr>
<td>References/location of the data</td>
<td>State of Europe's Forests Report (SoEF), State of Europe's Forests 2020 report | CEPF (cepf-eu.org)
FRA platform (fao.org)</td>
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<td>Data collection level</td>
<td>National (NUTS 0).</td>
</tr>
<tr>
<td>Frequency</td>
<td>Every 5 years (e.g.: 2010, 2015, 2020).</td>
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<td>Delay</td>
<td>1 year</td>
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<td>Comments/caveats</td>
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INDICATOR C.39	
Indicator Name	**Water abstraction in agriculture**
Type of indicator	**Environment**
Definition	This indicator refers to **the volume of water which is applied to soils for irrigation purposes.** Data concern water abstraction from total surface and ground water. In addition, information on the share of water abstraction in agriculture (for irrigation purposes) as a percentage of total gross (freshwater) abstraction can also be used to complement the indicator. Agriculture is a major user of water, primarily for irrigation in order to enhance the yield and quality of crops. It is therefore an essential driving force in the management of water use. Volume of water which is applied to soil for irrigation: - according to the definition applied in Council Regulation (EC) No 1166/2008 and in Commission Regulation (EC) No 1200/2009 on farm structure surveys and the survey on agricultural production methods, the volume of water used for irrigation per year is defined as the volume of water that has been used for irrigation on the holding during the 12 months prior to the reference date of the survey, regardless of the source (VIII. Irrigation, Annex II of Commission Regulation (EC) No 1200/2009). For each holding surveyed, Member States shall provide an estimation of the volume of water used for irrigation on the holding in cubic metres. The estimation may be produced by means of a model (art. 11 of Council Regulation (EC) No 1166/2008). Share of irrigation in total water abstraction: - according to the definitions delineated in the OECD/Eurostat Joint Questionnaire on Inland Waters, "total gross abstraction for agriculture of which irrigation" is defined as the "water which is applied to soils in order to increase their moisture content and to provide for normal plant growth". The indicator shows the importance of irrigation in the volumes of total water abstracted by countries for different sectors of water use.
Unit of measurement	Million m³
Data source	Eurostat – Environment and energy – Water statistics on national level
References/location of the data	Eurostat – environment statistics - Table annual water abstraction by source and by sector (env_wat_abs), data *water abstraction for irrigation purposes.* Information on the share of water abstraction in agriculture (for irrigation purposes) as a percentage of the total gross (freshwater) abstraction is also available. - Agro-environmental indicator (AEI) 20: Water abstraction, as defined in the COM (2006) 508 on "Development of agri-environmental indicators for monitoring the integration of environmental concerns into the CAP". http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_water_abstraction
Data collection level	National
Frequency	Annual data
Delay	2-3 years
Comments/caveats	The quality of data at the moment is quite poor as several MSs are missing.

INDICATOR C.40	
Indicator Name	**Water quality**
Type of indicator	**Environmental**
Definition	The water quality indicator shows **the potential impact of agriculture on water quality due to pollution by nitrates and phosphates**. Pollution by nitrates and phosphates is assessed through 4 sub-indicators: 1. **Gross Nitrogen Balance (GNB-N)**: Potential surplus of nitrogen on agricultural land (Gross Nitrogen Surplus). 2. **Gross Phosphorus Balance (GNB-P)**: Potential surplus of phosphorus on agricultural land (Gross Phosphorus Surplus). The gross nutrient balances provide an estimate of the potential water pollution. They represent the total potential threat of nitrogen and phosphorus surplus in agricultural soils to the environment. When N and P are applied in excess, they can cause surface and groundwater (including drinking water) pollution and eutrophication. 3. **Nitrates in freshwater - Groundwater**: % of monitoring sites in 3 water quality classes (high, moderate and poor); 4. **Nitrates in freshwater _- Surface water_**: % of monitoring sites in 3 water quality classes (high, moderate and poor). The three water quality classes are defined as follows: - <u>High quality</u>: concentration close to natural values or within the threshold indicated in the legislation for low-polluted water. - <u>Moderate quality</u>: concentration above natural standard but still below hazardous level. - <u>Poor quality</u>: concentration above hazardous level. The actual concentration classes are the following. <u>Groundwater</u> - <u>High ("<10 mg/l NO3 " + ">=10 mg/l NO3 and <25 mg/l NO3 ")</u>[10] - <u>Moderate (">=25 mg/l NO3 and <50 mg/l NO3 ")</u> - <u>Poor (">=50 mg/l NO3 ").</u> <u>Surface water</u> - <u>High ("<0.8 mg/l N " + ">=0.8 mg/l N and <2.0 mg/l N ")</u>[11] - <u>Moderate (">=2.0 mg/l N and <3.6 mg/l N " + ">=3.6 mg/l N and >5.6 mg/l N ")</u> - <u>Poor (">=5.6 mg/l N and <11.3 mg/l N " + ">=11.3 mg/l N ")</u> <u>The following indicators already exist:</u>

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[10] Although the natural concentration of NO_3 in groundwater is below 10 mg/l, in the Nitrate Directive for water bodies that show concentrations below 25 mg/l the monitoring programme should be repeated every eight years instead of four, in this line this threshold can be taken into account to design high quality or low-polluted water bodies.

[11] While natural concentration of nitrates in freshwater is about 1 mg/l, concentrations over 10 mg/l (2 mg-N/l) are those at which eutrophication and other negative effects on aquatic ecosystems appear. Therefore, this limit could be taken into account to design high quality or low-polluted water bodies.

	- Agri-environmental indicator 27.1 Water quality – Nitrates in freshwater: nitrate pollution of water. http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_nitrate_pollution_of_water - CSI 020 Nutrients in freshwater (European Environment Agency). Concentrations of nitrate in rivers and groundwater. The indicator can be used to illustrate geographical variations in current nutrient concentrations and temporal trends. - Agri-environmental indicator 15 Gross Nitrogen Balance: Potential surplus of nitrogen on agricultural land, http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_gross_nitrogen_balance - Agri-environmental indicator 16 Risk of pollution by phosphorus (Gross Phosphorus Balance): Potential surplus of phosphorus on agricultural land, http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_risk_of_pollution_by_phosphorus
Unit of measurement	1: kg N/ ha/ year 2.: kg P/ ha/ year The sub-indicators 1 and 2 are expressed as a 4 year average. 3-4: % of monitoring sites N.B. The concentration of nitrate is expressed as mg/l of nitrates (NO_3-mg/l) for groundwater and mg/l of nitrogen (N-mg/l) for rivers.
Data source	1-2 : Eurostat, Agri-environmental indicators 3-4:-European Environment Agency (EEA) – Nutrients in freshwater: Data voluntarily reported by Member States (EEA Member Countries) via the WISE/SOE (State of Environment) data flow annually.
References/location of the data	1-2: Eurostat, Agri-environmental indicators, Pressure and Risks, Table *Gross Nutrient Balance* (aei_pr_gnb); 3-4: EEA website, based on data reported to EIONET: Waterbase_rivers, Waterbase_groundwaters, CSI020 , http://www.eea.europa.eu/data-and-maps/indicators/nutrients-in-freshwater;
Data collection level	1-2: national 3-4: - data from the European Environment Agency: national and river basin level/water body - data from the Nitrate Directive reporting system (DG environment): national and river basin level.
Frequency	1-2: annual 3-4: not defined
Delay	1-4: not defined.
Comments/caveats	The AEI 15 on Gross Nutrient Balance is at the moment considered the most appropriate indicator to assess the CAP's impact on water quality, since it is directly linked with agriculture. It must be noted, however, that this indicator is only indirect; it shows the potential risks, depending on local soil conditions and farm management practices, rather than the actual water quality trends. For the interpretation of nitrates in fresh water, it should be kept in mind that it is hardly feasible to distinguish the contribution of agriculture or the role of a policy to this status compared to other influencing factors, even though it is acknowledged that agriculture is a main contributor.

For this reason the preferred option is to use data for Gross Nutrient Balance (4-year average) in combination with data for nitrates in freshwater by water quality classes. On the one hand, figures for nitrates in freshwater would give a comprehensive overview of the actual state of water bodies, allowing comparison over time. On the other hand, data for Gross Nutrient Balance would provide an indication of the impact of agriculture on those figures and give information about potential pollution by phosphates.

Since data for both indicators are only available at national level and since annual national balances can mask important regional or monthly variations, other sources at Member State level should be explored. As for the GNB, in the future, data should also be available at regional level (NUTS 2). Eurostat and the Joint Research Centre are working on a pilot project with 5 countries to regionalise GNB data.

Data on pesticides are currently less robust than those for nitrates, thus the originally proposed component on pesticides in freshwater has been dropped from the indicators for water quality.

The quality of data at the moment is quite poor as several MSs are missing.

INDICATOR C.41	
Indicator Name	**Soil organic carbon in arable land**
Type of indicator	**Environment**
Definition	The indicator estimates the **total organic carbon content in arable soils.**

It consists of 2 sub-indicators:

1 .**the total estimate of organic carbon content in arable land**

2. **the mean organic carbon content**

Soil organic carbon, the major component of soil organic matter, is extremely important in all soil processes. Organic matter in the soil is essentially derived from residual plant tissues, while microbial, fungal and animal contributions constitute a small part of its total amount. Microbes, fungi and animals decompose organic matter more or less efficiently depending on temperature, moisture and ambient soil conditions. The annual rate of loss of organic matter can vary greatly, depending on cultivation practices, the type of plant/crop cover, drainage status of the soil and weather conditions. There are two groups of factors that influence inherent organic matter content: natural factors (climate, soil parent material, land cover and/or vegetation and topography), and human-induced factors (land use, management and degradation) (de Brogniez, D., Ballabio, C., Stevens, A., Jones, R. J. A., Montanarella, L. and van Wesemael, B. (2014), A map of the topsoil organic carbon content of Europe generated by a generalized additive model. European Journal of Soil Science.)

The indicator is expressed as an estimate of the total Soil Organic Carbon stocks in topsoil (0-20) of EU Member States.

The mean Soil Organic Carbon concentration per Member State is calculated, though solely for orientation purposes since it has very limited scientific meaning given the high variability of Soil Organic Carbon concentration in different areas.

The following indicators on soil quality also exist:

- Agro-environmental indicator (AEI 26) Soil Quality: http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_soil_quality

Methodology:
The indicator is based on the map of topsoil organic carbon content at the European scale elaborated by the Joint Research Centre of the European Commission. The map is based on estimates calculated by coupling digital soil mapping techniques and statistical models to the first European harmonized geo-references topsoil (0-20 cm) database, which arises from the Land Use/Cover Area frame statistical Survey(LUCAS) of 2009, 2015 and 2018.

LUCAS is a field survey programme to monitor changes in the management and nature of the land surface of the European Union. It is also used for the collection of soil samples and their subsequent analysis to produce updated and harmonised maps of relevant soil parameters, including topsoil organic carbon (0-20 cm).

The map produced gives the most up-to-date general picture of topsoil organic carbon content at the European Union scale and is not intended to be a substitute for national scale or local maps that are based on more detailed spatial information. Moreover, it is important that the uncertainty associated with the predicted values is understood by the end-users and should encourage careful use and interpretation of the spatial values. The maps produced in this study will be freely available for download from the European Soil Data Centre website https://esdac.jrc.ec.europa.eu/ |

Unit of measurement	1: megatonnes (Mt); 2: g/kg.
Data source	De Rosa, D., Ballabio, C., Lugato, E., Fasiolo, M., Jones, A., Montanarella, L., Panagos, P. (2023) Soil organic carbon stocks in European agricultural soils: how much have we lost in the last decade? (in preparation). - Joint Research Centre (JRC Ispra) – Map of Topsoil Organic Carbon Content of Europe based on Land use/cover Area frame statistical Survey (LUCAS), (current version: 2015). The map is elaborated by the European Soil Database hosted by the Joint Research Centre; - de Brogniez, D., Ballabio, C., Stevens, A., Jones, R. J. A., Montanarella, L. and van Wesemael, B. (2014), A map of the topsoil organic carbon content of Europe generated by a generalized additive model. European Journal of Soil Science. doi: 10.1111/ejss.12193;
References/location of the data	The Map of Topsoil Organic Carbon Content is available on the European Soil Datacentre hosted by the Joint Research Centre http://eusoils.jrc.ec.europa.eu/ Other sources: National studies, surveys, reports
Data collection level	National (NUTS 0), regional (NUTS 2).
Frequency	The map is regularly updated depending on the availability of new data (the current version of the map is based on the 2018 LUCAS soil survey results). LUCAS survey is in principle carried out every three to four years. If this frequency is maintained in future, it could be envisaged that every second or third LUCAS survey (i.e. every six to eight years) a soil module could be added to determine changes compared to the 2009-2012 baseline.
Delay	The expected delay between soil sampling and the publication of the results is about 2-3 years.
Comments/caveats	SOC stocks were calculated based on the estimated total agricultural area indicated in the table. The sampling depth is 0 – 20 cm.

Indicator Name	**Soil erosion by water**
Type of indicator	**Environment**
Definition	This indicator consists of 2 sub-indicators: 1. **Estimated rate of soil loss by water erosion**; 2. **Estimated agricultural area affected by a certain rate of soil erosion by water**. (The estimated area is also expressed as share of the total agricultural area). The indicators assess the soil loss by water erosion processes (rain splash, sheetwash and rills) and give indications of the areas affected by a certain rate of soil erosion (moderate to severe, i.e. >11 t/ha/year in the OECD definition). Estimates of soil loss by water erosion in Europe are expressed in t ha^{-1} year^{-1} for cells of 100m x 100m for the EU. The two soil erosion indicators have been produced by the Joint Research Center of the European Commission (JRC-Ispra), on the basis of an empirical computer model. Assessments of soil erosion are based on the output of an enhanced version of the Revised Universal Soil Loss Equation model (named RUSLE2015) (JRC-Ispra) which was developed to evaluate soil erosion by water at a regional scale. The model provides an estimate of possible erosion rates and estimates sediment delivery on the basis of accepted scientific knowledge, peer review published manuscripts, technical judgment and input datasets. In this assessment, the basic RUSLE model has been adapted through the improved quality of the input layers. RUSLE2015 improves the quality of estimation by introducing updated (2010), high-resolution (100m) and peer-reviewed input layers of rainfall erosivity, soil erodibility, slope steepness and slope length, Land Cover and management and the support practices applied to control erosion. The Rainfall Erosivity was calculated based on high-resolution temporal rainfall data (5, 10, 15, 30 and 60 minutes) collected from 1,541 well-distributed precipitation stations across Europe. The Soil erodibility is estimated for the 20,000 field sampling points including in the Land Use/Cover Area frame (LUCAS) survey. The Land Cover and management accounts for the influence of land use (mainly vegetation type/cover and crop type) and management practices (mainly in arable lands) in reducing the rate of soil erosion by water. The Slope Steepness and Slope Length have been calculated using the latest Digital Elevation Model (DEM) at 25m. The support practices were estimated for the first time at European level taking into consideration the Good Agricultural and Environmental Conditions (GAEC). Only soil erosion resulting from rains plash, overland flow (also known as sheetwash) and rill formation are considered. These are some of the most effective processes to detach and remove soil by water. In most situations, erosion by concentrated flow is the main agent of erosion by water. The results of the soil erosion indicators have been aggregated at NUTS 3 and NUTS 2 level. The rates of soil loss by water erosion (t ha^{-1} year^{-1}) at Member State level represent national average values and therefore may mask higher erosion rates in many areas even for those countries that have a low mean. The total area of agricultural land has been defined on the basis of Corine Land Cover (CLC) 2012 classes and includes the area of arable and permanent crops, pastures and permanent grasslands. Estimated data on soil erosion are published following a qualitative assessment and compared with EIONET country estimates showing that the model output matches general erosion patterns across Europe. However also quantitative validation is foreseen to take place against long-term erosion plots. The following indicators also exist: - Agro-environmental indicator (AEI) 21 Soil Erosion, http://ec.europa.eu/eurostat/statistics-explained/index.php/Agri-environmental_indicator_-_soil_erosion

	1 and 2 above are, respectively, the supporting and main indicator of the AEI 21.
	- Soil erosion datasets of 9 European Union Countries have been collected through the EIONET-SOIL network during 2010.
Unit of measurement	1: t/ha /year
	2: ha and share of total agricultural area
Data source	- Joint Research Centre (JRC) – European Soil Data Centre (ESDAC)
	- Input data sources used for the model: LUCAS Topsoil 2009, European Soil Database, Corine Land Cover 2012, Rainfall Erosivity Database in Europe (REDES), Copernicus Remote Sensing, Eurostat Statistics, Digital Elevation Model (DEM), Good Agricultural Environmental Conditions (GAEC), Lucas Earth Observations 2012
	- Potential sources available at national level (studies, surveys, reports) can be explored and used.
References/location of the data	- Joint Research Centre (JRC) – ISPRA, http://eusoils.jrc.ec.europa.eu/
	- National studies, surveys, reports
Data collection level	National (NUTS 0) and regional (NUTS 2-3) level (based on 1 km cell – model output).
Frequency	A new soil erosion dataset is being published by the JRC in 2015.
	To evaluate changes in soil erosion over time it should be noted that an analysis over a time period of at least 15-20 years would be necessary (e.g. comparing the current situation to the 1990s). The time interval of 6 years (e.g. 2000-2006 for which data are available) is limited and differences are primarily due to changes in land cover (as indicated by Corine Land Cover data). Therefore, any conclusion must be drawn with caution.
Delay	Not defined.
Comments/caveats	The soil erosion indicator has been improved (e.g. taking into consideration the impact of Good Agricultural Environmental Conditions - GAEC) to better measure the link between agriculture and soil erosion. The new updated soil loss map takes into account land management practices such as reduced tillage, the planting of cover crops, keeping plant residues at the soil surface, the maintenance of stone walls, and the increased use of grass margins and contour farming.
	As it is now, the indicator can only give an indication of the erosion of soil in particular contexts. The estimated erosion rates are linked to agricultural practices and therefore the indicator reflects and captures the effects of policy measures to prevent erosion by agriculture. Moreover, the indicator gives only estimations and it is not directly measurable since it is based on modelling and estimations from different sources and parameters. It will not be updated regularly (depending on availability of resources). The individual layers which have been used to produce the indicator have been peer reviewed and accepted for publication by the scientific community. The individual input layers are also available in the European Soil Data Centre (ESDAC).
	In 2010, the European Soil Data Centre (ESDAC) invited the Primary Contact Points (PCPs) of EIONET to contribute to a data collection campaign of EIONET-SOIL in order to develop the European datasets for soil erosion and Soil Organic Carbon (SOC). There was no legal obligation for the EIONET member countries to participate and PCPs and NRCs for soil contributed on a voluntary basis.
	18 EIONET countries did not reply or declared that they do not own the requested soil data and/or refused to deliver data due to legal issues or other restrictions

	Due to this fact some discrepancies could appear between the data collected at Member State level and those presented by the JRC. The Member States that detect such a discrepancy are strongly recommended to submit their data through EIONET in order to allow the update and improvement of the model. The list of EIONET contact points for SOIL is available at the following URL: http://eusoils.jrc.ec.europa.eu/library/data/eionet/PrimaryPoints.cfm
	The indicator only covers soil erosion by water. JRC has developed datasets for the qualitative assessment of wind erosion. http://eusoils.jrc.ec.europa.eu/library/themes/erosion/winderosion/
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INDICATOR C.43	
Indicator Name	**Production of renewable energy from agriculture and forestry**
Type of indicator	**Environment**
Definition	This indicator measures the **production of renewable energy from agriculture and forestry.** It is broken down in 2 sub-indicators: 1. Production of renewable energy from agriculture 2. Production of renewable energy from forestry Due to data availability issues, production of renewable energy from **agriculture** covers: • Biodiesel - liquid biofuels derived from biomass (R5220P) • Ethanol from starch/sugar crops • Energy from agricultural biogas - two of the largest sources of these biogases are the fermentation of energy crops and the fermentation of manure on farms. (Other biogases from anaerobic fermentation; R5319) It does not cover: • Other renewable energy from agriculture, like heat from cereal straw etc. Part of the EU biodiesel production is based on non-domestic sources (imported vegetable oils, oilseeds), therefore an ad-hoc quantification of domestic production is not possible. In addition, the category "energy from agricultural biogas", even though it predominantly covers agricultural biogas, also contains some biogas from municipal solid waste etc. Production of renewable energy from **forestry** covers: Primary solid biofuels (R5110-5150_W6000RI): • Wood pellets • Other fuelwood, wood residues and by-products • Bagasse • Animal waste • Black liquor • Other vegetal material and residues • Classification of energy products and their definitions can be found in the UN's International Recommendations for Energy Statistics (especially its chapter 3: "Standard International Energy Product Classification"): https://unstats.un.org/unsd/energystats/methodology/documents/IRES-web.pdf Production of renewable energy from agriculture: The total production of renewable energy from agriculture is the sum of biodiesel, bioethanol and biogas production, all expressed in ktoe (kilotons of oil equivalent). Primary data on biogas, expressed in Terajoule, are converted into ktoe by applying the following coefficient $(((...TJ \times 1000/41868 = ...ktoe)$ Production of renewable energy from forestry: No calculation needed. Data on renewable energy from Wood & Wood Waste are directly available from Eurostat.
Unit of measurement	1-2: kilotonnes (1000 tonnes of oil equivalent, ktoe)
Data source	1: EurObserv'ER, Strategie Grains, Eurostat 2: Eurostat - Energy statistics

References/location of the data	1: DG Agriculture and Rural Development estimates based on: • Data on biogas: ESTAT table [nrg_cb_rw]: NRG_BAL: IPRD (indigenous production), SIEC: R5319 (Other biogases from anaerobic fermentation), UNIT: in Terajoule (conversion to TOE: [...TJ x 1000/41868 = ...ktoe]) (formerly: EurObserv'ER, Biogas Barometer (variable Other biogas: decentralised agricultural plants, municipal solid waste methanisation plants, centralised plants)*, available on www.eurobserv-er.org) • Data on biodiesel: ESTAT table: [nrg_bal_c]: NRG_BAL: Primary production, SIEC: R5220P - Pure biodiesels, UNIT: TOE. (Formerly European Biodiesel Board (EBB), website www.ebb-eu.org/stats.php) • Data on bioethanol: Tallage's report Stratégie grains, website www.strategie-grains.com 2: Eurostat – Energy Statistics TABLE [nrg_bal_c] - PRODUCT Primary solid biofuels (R5110-5150_W6000RI) - NRG_BAL: primary production Total production of renewable energy: Eurostat – Energy Statistics TABLE [nrg_bal_c] - PRODUCT Renewable and biofuels (RA000) - NRG_BAL primary production total Total energy production: Eurostat – Energy Statistics TABLE [nrg_bal_c]- PRODUCT Total - NRG_BAL primary production
Data collection level	National (NUTS 0).
Frequency	Annual
Delay	2 years
Comments/caveats	No data available on bioethanol for Estonia, Spain, Croatia, Cyprus, Luxembourg, Malta, Portugal and Slovenia.

INDICATOR C.44	
Indicator Name	**Energy use in agriculture, forestry and food industry**
Type of indicator	**Environment**
Definition	This indicator measures the **direct use of energy in agriculture, forestry and food processing** It consist of 3 sub-indicators: 1. **direct use of energy in agriculture and forestry in kilotons** 2. **direct use of energy in agriculture and forestry in kg of oil equivalent per ha** 3. **direct use of energy in food processing** This indicator is based on Eurostat data from the joint IEA/OECD-Eurostat-UNECE questionnaires. There are some limitations of data and sources: • Although energy statistics are of high quality in general, the data on energy consumption by agriculture are of lower quality due to errors and incomplete data. • The indicator only refers to direct use of energy by agriculture. Indirect energy used in agriculture for fertilisers, pesticides, animal feed and agricultural machinery, which are produced using large amounts of energy, is not included. • Data on energy consumption by agriculture from the questionnaires include the use of energy by forestry. Though data on energy consumption by fisheries should be reported separately since 2004, many data on agriculture/forestry, even after 2004, include (part of) energy consumption by fisheries. Energy consumption by agriculture may therefore be overestimated in countries with significant forestry or fisheries sectors. • Data on food processing are taken from the category "Food, beverages and tobacco" and therefore include the NACE category "Manufacture of food products, beverages and tobacco products". Data on food processing are thus overestimated.
Unit of measurement	1: agriculture and forestry - energy use, total in kilotons (1000 tonnes), ktoe 2: agriculture and forestry - energy use in kg of oil equivalent, UAA+forest area in ha 3: food, beverages and tobacco - energy use, - total in kilotons (1000 tonnes), ktoe
Data source	Eurostat - Energy statistics Eurostat – Crop statistics
References/location of the data	1-3: Eurostat – Simplified energy balances [nrg_bal_s] 2: Eurostat – Crop production in EU standard humidity [apro_cpsh1] Area of wooded land (source: FAO - FE) [for_area]
Data collection level	National (NUTS 0).
Frequency	Every year for energy statistics. Every 5 years for forest area (e.g. 2010, 2015). Every year for UAA crop statistics.
Delay	2 years
Comments/caveats	

INDICATOR C.45	
Indicator Name	**Emissions from agriculture**
Type of indicator	**Environment**
Definition	This indicator is composed of two sub-indicators, one assessing greenhouse gas (GHG) emissions and one ammonia emissions. Indicator 1) **GHG emissions from agriculture** The indicator measures **net GHG emissions from agriculture including agricultural soils**: 1. *Aggregated annual emissions of methane (CH_4) and nitrous oxide (N_2O) from agriculture* reported by Member States under the IPCC 'Agriculture' sector of the national greenhouse gas inventory submitted to the United Nations Framework Convention on Climate Change. That sector includes the following sources of GHG from agriculture — enteric fermentation of ruminants (CH_4) – UNFCC Sector 3.A; — manure management (CH_4, N_2O) – UNFCC Sector 3.B; — rice cultivation (CH_4) – UNFCC Sector 3.C; — agricultural soil management (mainly CH_4, N_2O) – UNFCC Sector 3.D. These emissions are part of the binding emission reduction targets laid out under the Effort Sharing Regulation (Regulation 2018/842), and reporting on these emissions is mandatory under the Governance Regulation (Regulation 2018/1999). 2. *Aggregated annual emissions and removals of carbon dioxide (CO_2), and (where these are not reported under the agriculture inventory) emissions of methane (CH_4) and nitrous oxide (N_2O) from agricultural land uses (grassland and cropland)*, are reported by Member States under the IPCC 'Land Use, Land Use Change and Forestry' (LULUCF) sector of the national GHG inventory to the UNFCCC: — Grassland – UNFCC Sector 4.C; — Cropland – UNFCC Sector 4.B. Emissions of CO_2 from the energy use of agricultural machinery, buildings and farm operations, which are included in the 'energy' inventory under UNFCCC, are not included in this indicator. These emissions and removals are covered by the LULUCF Regulation (Regulation 2018/841), and reporting on these emissions and removals is mandatory under the Governance Regulation (Regulation 2018/1999). The LULUCF categories that are relevant to this indicator are those related to cropland and grassland management, as defined in the Implementing Act accompanying the Governance Regulation. Indicator 2) **Ammonia emissions from agriculture** This indicator measures **total annual ammonia emissions (NH_3) from agriculture**, also broken down by subcategory as follows: — Synthetic N-fertilizers (NFR14 subsector 3DA1) — Cattle dairy (NFR14 subsector 3B1A)

	— Cattle non-dairy (NFR14 subsector 3B1B)
	— Swine (NFR14 subsector 3B3)
	— Laying hens (NFR14 subsector 3B4G1)
	— Broilers (NFR14 subsector 3B4G2)
	— All other agricultural subsectors (as a difference)
	— Total annual NH3 emissions from agriculture (NFR3B1A-NFR3B4H, 3DA1, 3DA2A, 3DA3)
	NFR means Nomenclature for Reporting, which refers to the format for the reporting of national data in accordance with the Convention on Long-Range Transboundary Air Pollution (CLRTAP) also remitted to the European Environment Agency (EEA).
Unit of measurement	1) **GHG emissions from agriculture** Absolute net GHG emissions are reported in tonnes of CO_2 equivalents. Relative net emissions are reported as a percentage of the net emissions in the reference year 2005. 2) **Ammonia emissions from agriculture** Kilotons of NH_3
Data source	The indicator is based on the annual national inventory submissions to the EU and subsequently the UNFCCC through the Monitoring Mechanism Regulation (Regulation 2018/1999). This reporting framework moreover describes requirements for monitoring and reporting under the Effort Sharing Regulation and LULUCF Regulation, e.g., Geospatial data sources for meeting IPCC approach 3 for LULUCF, such as services from the Copernicus programme, IACS/LPIS, LUCAS and others compliant with the INSPIRE directive. The inventory is compiled by each Member State, and then collated and quality-assured by the European Environment Agency (EEA) and the European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM).
References/location of the data	1) GHG emissions from agriculture National emissions reported to the UNFCCC and to the EU Greenhouse Gas Monitoring Mechanism provided by the European Environment Agency: https://www.eea.europa.eu/data-and-maps/data/national-emissions-reported-to-the-unfccc-and-to-the-eu-greenhouse-gas-monitoring-mechanism-16 The same data are also published in the UNFCCC database: http://di.unfccc.int/time_series and the Eurostat database: [env_air_gge] 2) Ammonia emissions from agriculture Air pollutant emissions data viewer (Gothenburg Protocol, LRTAP Convention) https://www.eea.europa.eu/data-and-maps/data/national-emission-ceilings-nec-directive-inventory-16 ESTAT: Air pollutants by source sector (source: EEA) [env_air_emis], Air pollutants by source sector aggregated for indicator sets (source EEA, aggregation by Eurostat) [env_air_emis_ind]

Data collection level	Member State
Frequency	Data collected annually
Delay	1) **GHG emissions from agriculture** 2 years 2) **Ammonia emissions from agriculture** One year (year Y in December Y + 1)
Comments/caveats	1) **GHG emissions from agriculture** IPCC guidance allows countries to report GHG emissions and removals according to different tiers. For most agriculture and LULUCF emissions and removals, tier 1 is based on the use of activity data (e.g. agricultural production statistics) and global emission factors. Tier 2 follows the same approach but applies nationally defined emission factors. Tier 3 involves the use of models and higher order inventory data tailored to national circumstances. Methodologies for GHG emission estimates should follow IPCC guidance, but need not be identical across Member States. In particular, when using lower tiers, GHG emission estimates do not capture the effects of all mitigation measures that are supported by the CAP. That would require a high level of stratification of activity data, and corresponding information on emission factors, which often is not available. As a result, GHG emission estimates, in particular in the 'agriculture sector' (non-CO_2 gases) may not reflect the impact of all measures put in place and have a high level of uncertainty. However, the bulk of emissions and removals is captured by low-tier methods. For example, the bulk of emissions in relation to agricultural soils is caused by the cultivation of organic soils and the conversion of grasslands, which can be represented by activity data. This indicator differs from the Pillar I result indicator as it includes both agricultural non-CO_2 GHG emissions and emissions/removals from agricultural soils. This more comprehensive approach is followed as instruments under Pillar I and II address emissions/removals of both categories. Member States are encouraged to improve GHG inventories towards higher tiers, which would allow demonstrating the effects of technological improvements. It is recognised that data constraints limit the level of information in some Member States for this indicator. However, the situation should improve over time as inventories become better developed. Total GHG emissions at national level are calculated both with and without LULUCF but without indirect CO_2. In a Member State, the ratio of emissions from agriculture (including soils) to total net emissions can be higher than 100% if there are removals of GHG from the atmosphere through land use, land use change and forestry (LULUCF). NO, NE is a UNFCCC notation key that means "not occurring, not estimated". 2) **Ammonia emissions from agriculture** Collection of these data is required under an existing reporting regime in the National Emission Ceilings Directive (2001/81 EC) and will not add any additional administrative burden for Member States.

Indicator C47	
Indicator name	**Indicator I.26 Limiting antimicrobials use in farmed animals:**

	Sales/use of antimicrobials in food producing animals
Type of indicator	**Environment**
Definition	This indicator refers to action to improve the response of EU agriculture to societal demands on food and public health such as fighting antimicrobial resistance (AMR), promoting production of safe, nutritious and sustainable food, as well as animal welfare. Data are : 1. per calendar year for any given year by MS [1] 2. provided by total sales of veterinary medicinal products containing antimicrobial substances 3. per species of food-producing animals
Unit of measurement	Sales of antimicrobial substances, (product package level), corrected by a Population Correction Unit (PCU)*.
Data source	European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) project, started by the European Medicines Agency (EMA) upon a request from the EC in 2009 to develop a harmonised approach for the collection and reporting of data on the use of antimicrobial agents in animals from EU Member States. Data is collected on a voluntary basis on sales of antimicrobial veterinary medicinal products (VMP) at package level from the EU Member States (MSs), EEA countries and Switzerland.
References / location of the data	1. EU Action plan on antimicrobial resistance 2017 https://ec.europa.eu/health/sites/health/files/antimicrobial_resistance/docs/amr_2017_action-plan.pdf 2. ESVAC interactive database https://bi.ema.europa.eu/analyticsSOAP/saw.dll?PortalPages 3. ESVAC Annual Reports http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000302.jsp#annual
Data collection / dissemination level	EU, National (NUTS 0), European Economic Area (EEA)
Frequency	Annual, from 2010 onwards
Timeliness	2 years
Comments/caveats	The data on sales of veterinary antimicrobials for food-producing animals should not be used for direct comparison between countries without considering differences in national contexts; and changes observed over time for certain countries should be interpreted with caution. More information can be found in the latest ESVAC report from which this data is extracted. One of the three pillars of the new European One Health Action Plan against AMR (2017) includes as key objective making the EU a best practice region in the fight against AMR, consolidating surveillance of AMR and antimicrobial consumption. Long term objective is the responsible and prudent use of antimicrobials (prevention/reduction) Stratification factors are used to calculate use data from the sales data according to target species for the different VMPs with more than one target specie; this is a pilot project within 5 MS, to be developed in the future. Once the new Regulation on veterinary medicinal products is to be applied (beginning 2022), all MS are obliged to start collecting data on sales and use of antimicrobials at farm level[2] in a stepwise approach for different species. [3]
Notes	* Population correction unit (PCU): the amounts of veterinary antimicrobial agents sold in the different countries are normalised by the animal population that could potentially be treated with antimicrobials in each country. The PCU has been established as a denominator for the sales data. The data sources used

and the methodology for the calculation of the PCU are comprehensively described in Appendix 2 of the Agency's report 'Trends in the sales of veterinary antimicrobial agents in nine European countries: 2005-2009' (EMA/238630/2011) 17. Animal categories included in the calculation of the PCU and the weights used to calculate the PCU are described in Annex 3 of this report. It must be emphasised that the PCU is purely a surrogate for the animal population that could potentially be treated.

[1] Malta did not contribute to the recent published data till 2017, ESVAC is till now a voluntary project

[2] Article 57 in New Veterinary Medicinal Product Regulation: "Member States shall collect relevant and comparable data on the volume of sales and the use of antimicrobial medicinal products used in animals, to enable in particular the direct or indirect evaluation of the use of such products in food-producing animals at farm level …"

[3] Article in New Veterinary Medicinal Product Regulation: „Member States shall be allowed to apply a progressive stepwise approach regarding the obligations set out in this Article."

Indicator C48	
Indicator name	**Indicator I.27 Sustainable and reduced use of pesticides:** **Risk, use and impacts of pesticides**
Type of indicator	**Environment**
Definition	It consists of 3 specific indicators: 1. Sales of pesticides 2. The Harmonised Risk Indicator 1 3. Sales of the most hazardous pesticides (so called "candidates for substitution") 1: Sales of pesticides is a proxy of pesticides use in agriculture. For this purpose, the indicator specifies sales of pesticides for each of the following categories: 'fungicides and bactericides', 'herbicides, haulm destructors and moss killers', 'insecticides and acaricides', 'molluscicides', 'plant growth regulators', and 'other plant protection products'. NB: Sales data currently available at EU level (Eurostat) covers both agricultural and non-agricultural activities. 2: The Harmonised Risk indicator 1 refers to the risk associated with pesticides and it is based on European Statistics on the placing on the market of pesticides. The indicator is available at EU and MS level. Sales data collected by Eurostat are categorised and weighted based on the regulatory status of the active substances under Regulation (EC) No 1107/2009. The resulting weights are aggregated according to the Commission Directive (EU) 2019/782 resulting in a harmonised, EU wide indicator. NB: All references to pesticides refer to plant protection products only. Biocides are included in the term pesticides, but data on biocides are not included in this indicator. 3: Sales of the most hazardous pesticides (so called "candidates for substitution") Active substances with certain properties defined in Regulation (EC) No 1107/2009 are considered as candidates for substitution. For plant protection products containing these active substances, Member States are required, when assessing an application for an authorisation, to evaluate if they can be replaced (substituted) by other adequate and less hazardous solutions (chemical or non-chemical).
Unit of measurement	1: kg 2: Index based on annual volumes of active substances placed on the market multiplied by the relevant weights (1= average for the period 2011-2013) 3: kg
Data source	1. Eurostat 2. Methodology for categorisation and weighting is based on the definition in Annex IV to the Directive 2009/128/EC (adopted by the Commission in May 2019)

	3. Eurostat: not publically available yet due to confidentiality reasons, but currently being addressed with the revision of Reg. (EC) No 1185/2009 concerning statistics on pesticides to overcome this problem and ensure that data will be publically available.
References / location of the data	Eurostat – Statistics on the placing on the market (sales) of pesticides table [aei_fm_salpest09] metadata:https://ec.europa.eu/eurostat/cache/metadata/en/aei_fm_salpest09_esms.htm The HRI 1 indicator at EU level published here The indicator at MS level is published by each MS here.
Data collection / dissemination level	EU, National (NUTS 0)
Frequency	Annual
Timeliness	2 years (at the latest 20 months after the end of the year for which the Harmonised Risk Indicator is being calculated)
Comments/caveats	The HRI1 indicator is based on the quantities of active substances sold in pesticides each year. Active substances are classified in 4 groups and 7 categories according to Annex IV to the Directive 2009/128/EC. A weighting is developed for each group: volume sold of active substances are multiplied for the respective weights in order to calculate a harmonised index which can be monitored over time. This indicator is also used for the EU reporting on UN Sustainable Development Goals. Lastly, Harmonised Risk Indicator 1 and the sales of the most hazardous pesticides (candidate for substitution) are both used as the measurement for the pesticide targets under the Farm to Fork strategy, i.e. overall reduction of use and risk from chemical pesticides by 50% by 2030, and reduction of the use of more hazardous pesticides by 50% by 2030. For both indicators, the baseline is 2015-2017.