Impact indicator fiches[1] (last update January 2023)

Indicator No.	Indicator name
I.01	Agricultural entrepreneurial income
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I.03	Total factor productivity in agriculture
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I.13	Soil erosion by water
I.14	Rural employment rate
I.15	Degree of rural poverty
I.16	Rural GDP per capita

[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).

FICHE CONTENTS

Indicator Name	*Title of the indicator used in the commission implementing regulation/guidance documents*
Related specific objective(s)	*Identification of the specific objective(s) as defined in the CAP intervention logic*
Definition	*Concise definition of the concept, including if the indicator already exists, e.g. Agri-environment 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 (EEA), 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 I.01	
Indicator Name	Agricultural entrepreneurial income
Related general objective(s)	Viable food production
Definition	Agricultural entrepreneurial income[2] 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 impact indicator no. 2). 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. Data needed: **Agricultural entrepreneurial income** (in real and current prices) **Annual work units** (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 number of hours worked: a standard conversion factor of 1800 hours per AWU and per year is used.

2. 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.

	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 I.02	
Indicator Name	**Agricultural factor income**
Related general objective(s)	**Viable food production**
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 two 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	A. EUR (in real terms)/AWU B. Index 2010 =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 I.03	
Indicator Name	Total factor productivity in agriculture
Related general objective(s)	Viable food production
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 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 skills, and changes in the organization of production. Methodology: 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 indexes 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: $TFP_0^t\_L = \frac{O_0^t\_L}{I_0^t\_L} = \frac{\left(\frac{q_{1t}}{q_{10}} * w_{10} + \frac{q_{2t}}{q_{20}} * w_{20} + \ldots + \frac{q_{nt}}{q_{n0}} * w_{n0}\right) / \left(w_{10} + w_{20} + \ldots + w_{n0}\right)}{\left(\frac{i_{1t}}{i_{10}} * x_{10} + \frac{i_{2t}}{i_{20}} * x_{20} + \ldots + \frac{i_{rt}}{i_{r0}} * x_{r0}\right) / \left(x_{10} + x_{20} + \ldots + x_{r0}\right)}$, while TFP Paasche index is defined as: $TFP_0^t\_P = \frac{O_0^t\_P}{I_0^t\_P} =$

	$$\frac{\left(\left(\frac{q_{10}}{q_{1t}} * w_{1t} + \frac{q_{20}}{q_{2t}} * w_{2t} + \ldots + \frac{q_{n0}}{q_{nt}} * w_{nt}\right) / (w_{1t} + w_{2t} + \ldots + w_{nt})\right)^{-1}}{\left(\left(\frac{i_{10}}{i_{1t}} * x_{1t} + \frac{i_{20}}{i_{2t}} * x_{2t} + \ldots + \frac{i_{r0}}{i_{rt}} * x_{rt}\right) / (x_{1t} + x_{2t} + \ldots + x_{rt})\right)^{-1}}$$ *where* q_{Jt} and i_{kt} are respectively the quantity of product *j* and factor k at time *t,* while w_{Jt} and 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: $TFP\_F_{=n} / TFP\_L * TFP\_P$
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_{It}/q_{I0} of the equations displayed above. Precise indicators chosen in the EAA: - Change in output volume (q_{It}/q_{I0}): 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_{It}/i_{I0}) 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: - Economic accounts for agriculture (EAA), - Crop statistics (APRO) - *Agricultural Labour Input Statistics* (ALI), - *Farm structure survey* (FSS) - Farm Accountancy Data Network (FADN).
Data collection level	EU, National (NUTS 0)
Frequency	Annual
Delay	1 Year
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 I.04	
Indicator Name	EU commodity price variability
Related general objective(s)	Viable food production
Definition	EU and world market commodity price variability will be established for a number of selected agricultural commodities. It will be calculated on the basis of monthly commodity market prices as reported in the data sources identified below. It will be calculated as the coefficient of variation measuring the dispersion of commodity prices around the mean over the period of 3 years. The coefficient of variation will be calculated as standard deviation of a set of prices / mean average. The indicator will be calculated for EU and world prices of the following agricultural commodities: - Soft wheat - Maize - Barley - Sugar - Butter - Skimmed milk powder - Cheese - Beef - Pork - Poultry - Eggs
Unit of measurement	%
Data source	Agriview, FAOSTAT, Other sources
References/location of the data	1. FAO : http://www.fao.org/giews - Wheat (US), no. 2, soft red winter, export price delivered at the US Gulf port for prompt or 30 days shipment- Maize (US), no. 2, yellow, f.o.b. US Gulf ports- Barley (Black Sea Feed f.o.b (International Grain Council) Meat, beef (Australia/New Zealand), chucks and cow forequarters, frozen boneless, 85% chemical lean, c.i.f. U.S. port (East Coast), ex-dock, beginning November 2002; previously cow forequarters (or alternatively Brazilian price) 2 World dairy prices: average of mid-point of price ranges reported bi-weekly by Dairy Market News (USDA). Available at dairy.ahdb.org.uk - Butter, Oceania, indicative export prices, f.o.b. ; Cheddar Cheese,

	Oceania, indicative export prices, f.o.b.; Skimmed Milk Powder, Oceania, indicative export prices, f.o.b.; Whole Milk Powder, Oceania, indicative export prices, f.o.b. 3. Other international sources: - Pork (US) carcass lean hogs US Iowa Minnesota (167-187 lb) at www.feedstuffs.com - Beef (Brazil) at www.pecuaria.com.br - Poultry US (www.feedstuffs.com) - Eggs (grade A, US - Chicago)(www.feedstuffs.com)- London white sugar 05, nearby (closing), average of daily quotations (London International Financial Futures and Options Exchange) 4. EU prices from AMIS through AGRIVIEW: as recorded in http://ec.europa.eu/agriculture/markets/prices/monthly en.pdf Product codes: BLTPAN (Breadmaking common wheat delivered Rouen), MAI (Feed maize, Bordeaux), ORGFOUR (Feed barley, Rouen), LAI 249 (SMP),LAI 254 (Butter), LAI 259 (Cheddar), C R3 (Bœufs) or A R3 (Young bovines), POULET ALL (Poultry), REGULATED (Pork, 0203 2 E), Eggs (0407005LM), white sugar (average of EU sugar prices based on producers and refiners communications to DG AGRI)
Data collection level	Collection at EU level (Member State level available in some cases) Calculation at EU level
Frequency	Price data are collected on monthly basis, but calculation of the indicator will be made on a yearly basis Comparison of indicator value should be made over 3 year long periods
Delay	Monthly
Comments/caveats	Using a small number of observations may give misleading results EU and world prices should be comparable The comparison of the development of coefficient of variation values for the selected agricultural commodities over a given time period will measure the level of price variability on the EU market as compared to the price variability on the world market. This comparison would indicate the extent to which the CAP instruments contribute to attaining the CAP general objective of viable food production and in particular the specific objective of maintaining market stability.

INDICATOR I.05	
Indicator Name	Consumer price evolution of food products
Related general objective(s)	Viable food production
Definition	The consumer price evolution of food products is measured on the basis of the price variability over 3-year period. It is calculated as the coefficient of variation measuring the dispersion of monthly consumer price indices of selected food products around the mean over the period of 3 years. The indicator will be calculated for EU and MS in the following food categories: - food - bread and cereals - meat - fish and sea food - milk, cheese and eggs - oils and fats - fruit - vegetables - sugar, jam, honey, chocolate and confectionery - other food.
Unit of measurement	Index (2015=100)
Data source	EUROSTAT - Harmonised Indices of Consumer Prices (HICP).
References/location of the data	Table reference: Harmonised index of consumer prices (HICP, 2015=100) – monthly data (index) – table prc_hicp_midx
Data collection level	Collected at national level Calculated at EU, Eurozone, European Economic Area level, MS level
Frequency	The HICP is disseminated monthly, around the middle of the month that follows the reference month. The flash estimate for the euro area and selected components are usually disseminated on the last working day of the reference month or shortly thereafter. No intermediate data updates are done outside the pre-agreed calendar update
Delay	1 month
Comments/caveats	Information is not detailed enough, available only by groups (meat - no breakdown by products; milk, cheese and eggs altogether, etc.. The EU composition is evolutive. It represents the value for MS which are a part of the EU in a given year (EU6-1958, EU9-1973, EU10-1981, EU12-1986, EU15-1995, EU25-2004, EU27-2007, EU28-2013, EU27-2020).

INDICATOR I.06	
Indicator Name	Agricultural trade balance
Related general objective(s)	Viable food production
Definition	**Agricultural trade balance = value of EU exports of agricultural goods - value of EU imports of agricultural goods**. It indicates whether the EU has a trade surplus or deficit in agricultural products and its size. The indicator may be broken down by different agricultural products, as defined by Combined Nomenclature (CN) codes, and by different EU export/import geographical areas. The indicator is calculated by Directorate-General for Agriculture and Rural Development (DG AGRI) yearly on the basis of EUROSTAT Comext data, using the definition of agricultural products developed internally (available in the Europa website: https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/agrifood-product-classes-details_en.pdf https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/agrifood-explanatory-note_en.pdf
Unit of measurement	*Euro*
Data source	EUROSTAT COMEXT database http://comext.eurostat.ec.europa.eu/ANALYTICAL_S10_V17_ECAS/Analytical.html (Internal platform) Dataset:EU SINCE 1999 CN (Simulated)
References/location of the data	COMEXT database - declarant EU28, partner - extra-EU28, trade flow: export and import; Combined Nomenclature codes as defined in AG AGRI Agricultural Trade Statistics publication (see link above); trade regime: 4
Data collection level	Availability at MS level Indicator at EU level
Frequency	Data available monthly Indicator calculation - yearly
Delay	Year Y is available FEB Y+1
Comments/caveats	The EU aggregated numbers do not include the UK, even for years prior to 2020.

INDICATOR I.07	
Indicator Name	Emissions from agriculture
Related general objective(s)	Sustainable management of natural resources and climate action
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 '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 (CO2),* and (where these are not reported under the agriculture inventory) emissions of methane (CH4) and nitrous oxide (N2O) from agricultural land uses (grassland and cropland), are reported by Member States under the '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. The indicator is a further development of the agri-environmental indicator (AEI) 19, 'Greenhouse Gas Emissions from Agriculture', which, however, only covers CH_4 and N_2O from agricultural activities.

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: 1 year
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-CO2 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-CO2 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** Data on emissions of air pollutants, including ammonia, are available for every year, giving the possibility to define baselines. Collection of these data is required under the reporting regime in the Directive on the reduction of national emissions of certain atmospheric pollutants (2016/2284/EU) and will not add any additional administrative burden for Member States.

INDICATOR I.08	
Indicator Name	**Farmland bird index**
Related general objective(s)	**Sustainable management of natural resources and climate action**
Definition	The farmland bird indicator is intended as a barometer of change for the biodiversity of agricultural landscapes in Europe. 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 covers 39 species[1]), 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. Data going back to the 1980s however exist and are available at the EBCC website. The indicator already exists: - Agro-environmental indicator (AEI) 25: Population trends of farmland birds; - SDG - Biodiversity: Common Birds Index (Eurostat). - SEBI indicator 01: abundance and distribution of selected species, which includes common farmland bird index (Pan-European Streamlining European Biodiversity Indicators (SEBI) initiative, EEA, DG ENV, etc.)

Unit of measuremen	Index
Data source	EBCC/RSPB/BirdLife/Statistics Netherlands: the European Bird Census Council (EBCC) and its Pan-European Common Bird Monitoring Scheme (PECBMS), https://pecbms.info/ 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. National index: Eurostat, as of 2018, receives data from the OECD, which receives data from national offices who are part of the PECBMS network
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	1-3 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.

INDICATOR I.09	
Indicator Name	High nature value (HNV) farming
Related general objective(s)	Sustainable management of natural resources and climate action
Definition	This indicator is defined as the **percentage of Utilised Agricultural Area farmed to generate High Nature Value (HNV)**. 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 UAA (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 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 impact 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

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INDICATOR I.10	
Indicator Name	Water abstraction in agriculture
Related general objective(s)	Sustainable management of natural resources and climate action
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
Unit of measurement	Million m^3
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 (NUTS 0)
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 I.11	
Indicator Name	Water quality
Related general objective(s)	Sustainable management of natural resources and climate action
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 two main indicators, each of which is composed of two sub-indicators: Indicator 1) Gross Nutrient Balance which comprises: **1.a)** Gross Nitrogen Balance (GNB-N): Potential surplus of nitrogen on agricultural land (Gross Nitrogen Surplus). **1.b)** 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 to the environment of nitrogen and phosphorus surplus in agricultural soils. When N and P are applied in excess, they can cause surface and groundwater (including drinking water) pollution and eutrophication. Indicator 2) Nitrates in freshwater which consists of: **2.a)** Groundwater quality: % of monitoring sites in 3 water quality classes (high, moderate and poor); **2.b)** Surface water quality: % of monitoring sites in 3 water quality classes (high, moderate and poor). The three water quality classes are defined as follows: - High quality: concentration close to natural values or within the threshold indicated in the legislation for low-polluted water. - Moderate quality: concentration above natural standard but still below hazardous level. - Poor quality: concentration above hazardous level. The actual concentration classes are the following. Groundwater - High ("<10 mg/l NO_3 " + ">=10 mg/l NO_3 and <25 mg/l NO_3 ")[2]

[2] 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.

	- Moderate (">=25 mg/l NO_3 and <50 mg/l NO_3 ") - Poor (">=50 mg/l NO_3 "). Surface water - High ("<0.8 mg/l N " + ">=0.8 mg/l N and <2.0 mg/l N ")[3] - Moderate (">=2.0 mg/l N and <3.6 mg/l N " + ">=3.6 mg/l N and >5.6 mg/lN ") - Poor (">=5.6 mg/l N and <11.3 mg/l N " + ">=11.3 mg/l N ") The following indicators already exist: - 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) Gross Nutrient Balance kg / ha/ year; The indicator is expressed as a 4 year average 2) Nitrates in freshwater 1.a) Groundwater quality: % of monitoring sites; 2.b) Surface water quality: % of monitoring sites. N.B. The concentration of nitrates 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) Eurostat, Agri-environmental indicators, Pressure and Risks
	2) 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 ;

[3] 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.

References/location of the data	1: Eurostat, Agri-environmental indicators, Pressure and Risks, Table *Gross Nutrient Balance* (aei_pr_gnb); 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)Gross Nutrient Balance: national 2)Nitrates in freshwater - 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) annual 2) not defined.
Delay	1) not defined. 2) 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. 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.

INDICATOR I.12	
Indicator Name	Soil organic carbon in arable land
Related general objective(s)	Sustainable management of natural resources and climate action
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** 1) 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. 2)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: **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).

	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 http://eusoils.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
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	EU, 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.

INDICATOR I.13	
Indicator Name	Soil erosion by water
Related general objective(s)	Sustainable management of natural resources and climate action
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 Centre 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 ndicator (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.
Unit of measurement	1) t/ha /year 2) ha, %
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 2006/2012, Rainfall Erosivity Database in Europe (REDES), Copernicus Remote Sensing, Eurostat Statistics, Digital Elevation Model (DEM), Good Agricultural Environmental Conditions (GAEC), Lucas Earth Observations 2009/2012/2015, Farm Field Survey (FSS) statistical data 2010/2016 (source: Eurostat). -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	3-5 years - 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	3 years.
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). 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/
References	Panagos, P., Meusburger, K., Ballabio, C., Borrelli, P., Alewell, C. (2014) Soil erodibility in Europe: A high-resolution dataset based on LUCAS. Science of Total Environment, 479-480(2014) pp. 189-200. Panagos, P., Ballabio, C., Borrelli, P., Meusburger, K., Klik, A., Rousseva, S., Tadic, M.P., Michaelides, S., Hrabalíková, M., Olsen, P., Aalto, J., Lakatos, M., Rymszewicz, A., Dumitrescu, A., Beguería, S., Alewell, C. Rainfall erosivity in Europe. Sci Total Environ. 511 (2015), pp. 801-814. Panagos, P., Borrelli, P., Meusburger, K., van der Zanden, E.H., Poesen, J., Alewell, C. 2015. Modelling the effect of support practices (P-factor) on the reduction of soil erosion by water at European Scale. Environmental Science & Policy 51: 23-34. Panagos, P., Borrelli, P., Meusburger, K. 2015. A New European Slope Length and Steepness Factor (LS-Factor) for Modeling Soil Erosion by Water. Geosciences, 5: 117-126. Panagos, P., Borrelli, P., Meusburger, C., Alewell, C., Lugato, E., Montanarella, L., 2015b. Estimating the soil erosion cover management factor at European scale. Land Use Policy Journal (in Revision). Panagos, P., Meusburger, K., Van Liedekerke, M., Alewell, C., Hiederer, R., Montanarella, L. 2014. Assessing soil erosion in Europe based on data collected through a European Network. Soil Science and Plant Nutrition, 2014, Vol. 60 (1), pp. 15-29.

INDICATOR I.14	
Indicator Name	Rural employment rate
Related general objective(s)	Balanced territorial development
Definition	**Employed persons aged 15-64 years and 20-64 years[4] 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 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. **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	share of total population of the same age group
Data source	Eurostat - Labour Force Survey
References/location of the data	Employment rates are calculated by Eurostat and disseminated on its website. National data, including by typology: table Employment rates by age and degree of urbanisation (%) [lfst_r_ergau] Regional data: Employment rates by age and NUTS 2 regions (%) [lfst_r_lfe2emprt]

In the programming period 2007-2013, the employment rate was calculated for the age group of 15-64. In the Europe 2020 strategy, reaching an employment rate of 75% of the population aged 20-64 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.

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	Although the use of the degree of urbanisation has been selected as the most appropriate for the indicator "rural employment rate", the urban/rural typology is the one to be used when the information is available at NUTS 3 (for example, for the indicator "Rural GDP per capita").

INDICATOR I.15	
Indicator Name	Degree of rural poverty
Related general objective(s)	Balanced territorial development
Definition	**The indicator is defined as the share of population at risk of poverty or social exclusion in rural areas**. 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. The at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income after social transfers.(http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:At-risk-of-poverty rate) The degree of rural poverty (share of population at risk of poverty) 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).
Unit of measurement	- % of total population
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 (NUTS0) and regional (NUTS 1 and 2)
Frequency	Annual
Delay	2 years
Comments/ caveats	

INDICATOR I.16	
Indicator Name	Rural GDP per capita
Related general objective(s)	Balanced territorial development
Definition	**GDP per capita in predominantly rural regions, in PPS[5]** 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 indicators are calculated: • Index of GDP in PPS per inhabitant in rural areas • Index of GDP in PPS per inhabitant in percentage of the EU average for rural areas.
Unit of measurement	Index of GDP in PPS (for the simple reporting of absolute values) % (for comparison of values from rural areas to those of other areas or to the EU average)
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/methodologyRegional data, by typology: DG AGRI calculation using regional data
Data collection level	EU, national (NUTS0) and regional (NUTS 1, 2 and 3)
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.

[5] 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.