

**Ecosystem Condition Accounts:
Data validation rules and checks 2026**

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The structure of the document

This document presents a compilation of rules and checks for the validation of data reported in the EU Ecosystem Condition Accounts (ECOCON) questionnaire by countries to Eurostat, and informs compilers about the process.

A validation rule is a logical statement applied to data, which may result, in case of this data collection, in three possible outcomes:

- **PASS/OK** – data meet the condition of the validation check, i.e. no issues detected and no action needed from the reporting country.
- **WARNING** – thresholds have been exceeded, i.e. the reporting country has to confirm the data and briefly explain for what reasons (e.g. country-specific circumstances) reported data do not conform to pre-agreed rules and thresholds. Data may be accepted based on the explanation.
- **ERROR** – data do not conform to well-established accounting / mathematical rules, i.e. the reporting country must correct and resubmit the data.

The document presents validation rules from two perspectives: (i) the total of Annexes 1-3 presents the complete set of validation rules; (ii) Annex 4 then presents the same complete set of validation rules, but grouped according to the validation tool that performs them (regardless of their grouping in Annexes 1-3). Annex 4 is included in this document for information, to help compilers understand the validation process and required action on their part.

More specifically, the document is structured in five annexes:

- **Annex 1:** examines the general content of cells in the questionnaire in terms of validity of used symbols (data cells, cells intended for flags, reference years and country code) without considering the relationship with other cells.
- **Annex 2:** includes internal consistency checks within ECOCON tables (e.g., variable x > variable y)
- **Annex 3:** includes plausibility checks: (i) the examination of the time series, (ii) the plausibility of data with regard to other data points of the questionnaire and (iii) plausibility assessment using relevant Copernicus products as a reference.
- **Annex 4:** summarizes the process and steps in the validation. Each dataset submitted to Eurostat needs to pass through a series of validation points ("gates"). Each point is associated with a specific validation tool using a subset of validation checks presented in earlier annexes. The objective of the step-wise validation is to filter out obvious errors in submitted data and inform the compiler about the need for correction as fast after the submission as possible (the immediate "bounce-back checks" implemented at the earliest validation points) so that only datasets cleaned of obvious errors reach the database where a more time-consuming plausibility takes place. This section helps compilers understand what to expect during the validation.
 - **Validation step 1: Built-in macro function in the questionnaire to be used by countries before submitting data to Eurostat (i.e. pre-validation).**
 - **Validation step 2a: STRUctural VALidation of the questionnaire. Datasets failing these STRUVAL checks are automatically rejected by Eurostat's IT system. Country receives an immediate error report via EDAMIS listing issues that need to be corrected before the content of the dataset can reach Eurostat and be examined further.**
 - **Validation step 2b: CONtEnt VALidation of the questionnaire. Datasets failing these CONVAL checks are automatically rejected by Eurostat's IT system. Country receives an immediate error report via EDAMIS listing issues that need to be corrected so that the dataset can be loaded to Eurostat's internal database for further validation and subsequent publication.**
 - **Validation step 3: SQL-based validation performed in Eurostat's internal database after data upload. The output of this step is the Ms Excel validation (and revision) report, sent to countries via EDAMIS channel – 'ENVDATA_ECONVR_N'.**
- **Annex 5:** lists Eurostat codes for all items reported in the ECOCON questionnaire; they are also used in the validation report, i.e. the annex is the reference list of codes for national compilers.

Annex 1 – ECOCON – validation of general content of questionnaire cells /correctness of symbols used

Worksheet ‘GETTING STARTED’

Rule 1 – CONTACT DETAILS	
Coded format	
Description	The cells designated to include compilers’ ‘Name’, ‘Institution’ and ‘e-mail’ must not be blank.
Threshold	NA
Notification	WARNING

All data tables

Rule 1b – COUNTRY ¹	
Coded format	
Description	The content of cells designated for the code of the reporting country must be equal to one of the 2-letter country codes defined by the EU.
Threshold	NA
Notification	ERROR

Rule 2 – REFERENCE YEAR ²	
Coded format	
Description	The content of cells designated for the reference year must be filled in with a valid reference year.
Threshold	NA
Notification	ERROR

Rule 2b – REFERENCE YEAR – EDAMIS ³	
Coded format	
Description	The reference year entered in the cells designated for the reference year must be equal to the reference year entered in the EDAMIS submission system, i.e. the one appearing in the EDAMIS file name ‘ENVDATA_ECOCON_3_xx_YYYY_0000_V000x’.
Threshold	NA
Notification	ERROR

¹ In reality, countries only fill in the country code on worksheet ‘GETTING STARTED’ (and it is copied to all tables). However, the validation check examines the correctness of the country code in all table (all worksheets), therefore the check is listed here as applicable to ‘All tables’.

² As above.

³ As footnote above.

Rule 3 – COMPLETENESS

Coded format	
Txt code	(i) QC_COMPLETENESS_01A_T1 (ii) QC_COMPLETENESS_01A_T2
Description	The dataset must include all mandatory characteristics as specified in Regulation (EU) 691/2011, Annex IX for: (i) Questionnaire Table 1a (ii) Questionnaire Table 1b
Threshold	NA
Notification	ERROR

Rule 4 – FLAGS

Coded format	
Txt code	(i) QC_FLAGS_01_01 (ii) QC_FLAGS_01_03 (iii) QC_FLAGS_01_P_Flag
Description	(i) The content of cells designated for flags and footnotes must not differ from predefined entries (i.e. 'b', 'e', 'p' for cells for standard footnotes and 'a number' for cells for country-specific footnotes). (ii) The content of cells designated for flags and footnotes and related cells for data must be a valid combination of symbols. (iii) Provisional flag from previous data collection (must be removed – final data)
Threshold	NA
Notification	(i) ERROR (ii) ERROR (iii) WARNING

Rule 5a – NUMERIC

Coded format	
Description	The content of cells designated for data must be a number.
Threshold	NA
Notification	ERROR

Rule 5b – MUST NOT BE NEGATIVE

Coded format	
Txt code	QC_SELECT_WHERE_NEG

Description	The content of the cell after rounding to 0 decimal places must not be a negative number. This applies to all reporting items of the questionnaire.
Threshold	NA
Notification	ERROR

Rule 5c – PERCENTAGE

Coded format	ECOCON(ECOCON_01_01A,ECOCON_01_01B,ECOCON_01_01C,ECOCON_01_01D,ECOCON_04_03,ECOCON_11_01) <0, 100>
Txt code	
Description	The content of the cell for ecosystem condition indicators which use percentage as unit must be between values 0 and 100, including.
Threshold	NA
Notification	ERROR

Rule 5d – VALUE RANGES

Coded format	(i) ECOCON(ECOCON_01_02A) <5,30> (ii) ECOCON(ECOCON_04_02A) <0,50> (iii) ECOCON(ECOCON_04_03) <10,90> (iv) ECOCON(ECOCON_02_01B) <30,60> (v) ECOCON(ECOCON_03_01B) <50,100> (vi) ECOCON(ECOCON_02_01C2, ECOCON_03_01C2) <100, 300>
Txt code	(i) QC_SELECT_WHERE_ECOCON_01_02A (ii) QC_SELECT_WHERE_ECOCON_04_02A (iii) QC_SELECT_WHERE_ECOCON_04_03 (iv) QC_SELECT_WHERE_ECOCON_02_01B (v) QC_SELECT_WHERE_ECOCON_03_01B (vi) QC_SELECT_WHERE_ECOCON_02_03_01C2
Description	The values reported for the following ecosystem condition indicators should fall in the following ranges: (i) Concentration of PM2.5 between 5 and 30 ug/m3 (ii) Amount of deadwood between 0 and 50 m3/ha (iii) Tree cover density between 104 and 90% (iv) SOC in cropland mineral soil (0-30 cm) between 30 and 60 t/ha (v) SOC in grassland mineral soil (0-30 cm) between 50 and 100 t/ha (vi) SOC in cropland and grassland organic soils (0-30 cm) between 100 – 300 t/ha
Threshold	NA
Notification	WARNING

⁴ <10% does not meet the definition of Forest and woodland, nor FAO definition of Forest

Annex 2 – ECOCON – internal consistency checks

Table 1a – Aggregation

Rule 6a – AGGREGATION – DEADWOOD	
Coded format	(i) If all addends available: ECOCON_04_02A = ECOCON_04_02A1 + ECOCON_04_02A2 (ii) If one addend missing: calculation missing
Txt code	(i) QC_ADDITIONS_ECOCON_04_02A_M3_HA_mand_eq_sum (ii) QC_ADDITIONS_ECOCON_04_02A_M3_HA_mand_eq_sum_notall
Description	Values for total Deadwood have to be: (i) If both addends available: equal to the sum of values reported for Deadwood – standing and Deadwood – lying. (ii) If one addend missing, it can be calculated.
Threshold	0.01
Notification	(i) ERROR (ii) WARNING

Table 1a – Comparison

Rule 7a – SOC_CM30 ≤ SOC_CM100	
Coded format	(i) ECOCON_02_01C2 ≤ ECOCON_02_01C1 (ii) ECOCON_03_01C2 ≤ ECOCON_03_01C1
Txt code	(i) QC_SELECT_WHERE_DIMENSION_7ai (ii) QC_SELECT_WHERE_DIMENSION_7aai
Description	Value reported for ‘Organic carbon stock in organic soils in topsoil’ must be smaller than or equal to ‘Organic carbon stock in organic soils in the top 100 cm’ for both (i) ‘Cropland’ and (ii) ‘Grassland’.
Threshold	0.01
Notification	ERROR

Rule 7b – SOC_100CM ≤ SOC_WHL	
Coded format	(i) ECOCON_02_01C1 ≤ ECOCON_02_01C (ii) ECOCON_03_01C1 ≤ ECOCON_03_01C
Txt code	(i) QC_SELECT_WHERE_DIMENSION_7bi (ii) QC_SELECT_WHERE_DIMENSION_7bii
Description	Value reported for ‘Organic carbon stock in organic soils in the top 100 cm’ must be smaller than or equal to ‘Organic carbon stock in organic soils in the whole depth’ for both (i) ‘Cropland’ and (ii) ‘Grassland’.
Threshold	0.01

Notification	ERROR
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Rule 7c – SOC_MINERAL ≤ SOC_ORGANIC

Coded format	(i) ECOCON_02_01B ≤ ECOCON_02_01C2 (ii) ECOCON_03_01B ≤ ECOCON_03_01C2
Txt code	(i) QC_SELECT_WHERE_DIMENSION_7ci (ii) QC_SELECT_WHERE_DIMENSION_7cii
Description	Value reported for 'Organic carbon stock in topsoil in mineral soils' must be smaller than or equal to 'Organic carbon stock topsoil in organic soils' for both (i) 'Cropland' and (ii) 'Grassland'.
Threshold	0.01
Notification	ERROR

Annex 3 – ECOCON plausibility checks

Time-series analyses

Rule 8 – TIME SERIES	
Coded format	ECOCON(period n) = +/- 5%ECOCON(period n-1)
Txt code	QC_PLAUSIBILITY_02
Description	Values reported for an ecosystem condition indicator should be within +/- 5% range of the value reported for the same indicator in the previous reference year.
Threshold	+/- 5%
Notification	WARNING

Internal plausibility

Rule 9 – COMPARISON – SOC	
Coded format	ECOCON(ECOCON_02_01A) ≤ ECOCON(ECOCON_03_01A)
Txt code	QC_SELECT_WHERE_DIMENSION_9
Description	Value reported for the stock of organic carbon in topsoil (30 cm) in 'Cropland' should not exceed the value reported for the stock of organic carbon in topsoil (30 cm) in 'Grassland'.
Threshold	0.01
Notification	WARNING

Plausibility – Copernicus

Rule 10a – COPERNICUS - WARNING	
Coded format	
Txt code	QC_ECOCON_EEA_lc_warn
Description	Value reported for the following indicator should not differ by more than 10% from values for the same indicators derived from the respective Copernicus products (as derived by the EEA): • ECOCON_01_01A • ECOCON_01_01B • ECOCON_01_01C (as per NRR Article 14, 4a) • ECOCON_01_01D (as per NRR Article 14, 4a) • ECOCON_01_01E • ECOCON_01_02A (in ECO01 – 11; TOTAL) • ECOCON_04_03 • ECOCON_11_01 (in ECO01 – 11; TOTAL)
Threshold	10%
Notification	WARNING

Rule 10b – COPERNICUS - ERROR	
Coded format	
Txt code	QC_ECOCON_EEA_lc_err
Description	Value reported for the following indicator should not differ by more than 10% from values for the same indicators derived from the respective Copernicus products (as derived by the EEA): • ECOCON_01_01A • ECOCON_01_01B • ECOCON_01_01C (as per NRR Article 14, 4a) • ECOCON_01_01D (as per NRR Article 14, 4a) • ECOCON_01_01E • ECOCON_01_02A (in ECO01 – 11; TOTAL) • ECOCON_04_03 • ECOCON_11_01 (in ECO01 – 11; TOTAL)
Threshold	30%
Notification	ERROR

Annex 4 – Validation tools, error reporting to countries and requested action

Validation tool step 1: Built-in macro functions in the ECOCON questionnaire – pre-validation by countries using button ‘Validate questionnaire’	
Summary	This step is to be performed by countries (or a similar, alternative of pre-validation is to be conducted if macro functions cannot be executed) <u>before the questionnaire is submitted to Eurostat.</u>
The tool examines compliance with rules	The following rules from Annex 1 of this document: • Rule 1a – CONTACTS DETAILS • Rule 1b – COUNTRY • Rule 2a – REFERENCE YEAR • Rule 3 – COMPLETENESS • Rule 4 – FLAGS • Rule 5a – NUMERIC • Rule 5b – MUST NOT BE NEGATIVE
Reporting of issues	Outcomes of pre-validation are shown in the questionnaire in two ways: cells associated with an issue are (i) shown as red (ERROR; yellow for WARNING) and (ii) listed in the ‘ErrorLog’ worksheet.
Required action by countries	Identified issues must be corrected before submitting the dataset via EDAMIS.
Consequence of corrections not implemented	In case of a country code or reference year missing (in the cells designated for this purpose), the dataset will be automatically rejected upon submission (i.e. it does not reach Eurostat’s database and no further examination can be performed). The country will receive an automated message via EDAMIS within a few minutes after the submission. In case of issues that are also covered by the CONTENT VALIDation tool (see Validation step 2b below), the dataset will be automatically rejected (i.e. it does not reach Eurostat’s database and no further examination can be performed). The country will receive an automated message via EDAMIS within a few minutes after the submission. In case of issues that are also covered by the SQL-based validation tool (see Validation step 3 below), these will be reported to the country in the validation report (see below for further steps) within a few weeks after the submission.

Validation tool step 2a: STRUctural VALidation tool

Summary	This step takes place automatically upon the submission of data by countries via EDAMIS to Eurostat and incompliance <u>results in an automated rejection of the dataset.</u> Errors of this kind should not occur unless countries have manipulated the questionnaire structure, deleted codes or formulas copying country code or the reference year from the 'GETTING STARTED' cover sheet to the data-reporting sheets ⁵ , or copy-pasted items beyond reporting cells.
The tool examines compliance with rules	Correctness of the data structure (using predefined codes for data dimensions) and the following rules from Annex 1 of this document: • Rule 1b – COUNTRY • Rule 2 – REFERENCE YEAR • Rule 4 – FLAGS • Rule 5a – NUMERIC
Reporting of issues	Outcomes of this validation step are summarized in an automated message ('FEEDBACK TRANSFER FOR DATASET ENVDATA_ECOCON') sent to the compiler via EDAMIS containing text either 'ACCEPTED' or 'REJECTED'. Error details are available in the EDAMIS report available at the generated link.
Required action by countries	<u>Errors must be corrected and dataset resubmitted via EDAMIS.</u> Countries must not manipulate the structure of the questionnaire. This means adding or removing rows or columns in the reporting table, deleting hidden codes (which serve for structural validation and upload to Eurostat's internal database), or deleting formulas that copy the country code and reference year from the 'GETTING STARTED' cover sheet to the data-reporting sheets.
Consequence of corrections not implemented	Dataset is rejected (i.e. it does not reach Eurostat's database and no further examination can be performed).

Validation tool step 2b: CONtEnt VALidation tool⁶

Summary	This step takes place automatically upon the submission of data by countries via EDAMIS to Eurostat and incompliance <u>results in an automated rejection of the dataset.</u>
The tool examines compliance with rules	The following rules from this document: • Rule 2b – REFERENCE YEAR – EDAMIS • Rule 5b – NOT BE NEGATIVE • Rule 5c – PERCENTAGE

⁵ The questionnaire is locked to reduce the risk of these issues occurring.

⁶ Currently, this step is limited to a small number of simple checks. The vision for the future is that checks currently performed in Eurostat's internal database using SQL will be performed by the CONVAL tool, as it is done for advanced domains of statistics. (i.e. the step of SQL-based validation in Eurostat's internal database will be discontinued/converted to the above.)

Reporting of issues	Outcomes of this validation step are summarized in an automated message ('FEEDBACK TRANSFER FOR DATASET ENVDATA_ECOCON') sent to the compiler via EDAMIS containing text either 'ACCEPTED' or 'REJECTED'. Error details are available in the EDAMIS report available at the generated link.
Required action by countries	<u>Errors must be corrected and dataset resubmitted via EDAMIS.</u>
Consequence of corrections not implemented	Dataset is rejected (i.e. it does not reach Eurostat's database and no further examination can be performed).

Validation tool step 3: Database validation (in Eurostat's internal database)

Summary	This step takes place after the data had been loaded to Eurostat's internal database (i.e. after a successful validation in steps 2a and 2b described above). The SQL-based validation comprises (i) internal consistency check within ECOCON tables; (ii) the examination of the time series, (iii) the plausibility of data with regard to other data points of the questionnaire and (iv) plausibility assessment using relevant Copernicus products as a reference.
The tool examines compliance with rules	The following rules from Annex 1 of this document: • Rule 3 – COMPLETENESS • Rule 4 – FLAGS • Rule 5b – MUST NOT BE NEGATIVE • Rule 5d – VALUE RANGES All rules included in Annex 2. All rules included in Annex 3.
Reporting of issues	Outcomes of this validation step are summarized in the MS Excel validation report sent to countries via EDAMIS channel 'ENVDATA_ECONVR_N' .
Required action by countries	Data points associated with WARNINGS need to be explained and justified. Data points associated with ERRORS need to be corrected. They can be accepted temporarily if the country and Eurostat agree on corrective measures to be implemented in future data collections.
Consequence of corrections not implemented	Data points reported by the validation report as ERRORS may be excluded from publication by Eurostat unless a satisfactory explanation is provided by the national compiler.

Annex 5 – List of codes

Code	Label	Code note (extended label)
ECOCON_01_01A	Green areas in cities and adjacent towns and suburbs (LAU)	Green areas in city LAUs and adjacent towns and suburbs
ECOCON_01_01B	Green areas in Settlements and other artificial areas (ECO01)	Green areas in ecosystem type 1 'Settlements and other artificial areas'
ECOCON_01_01C	Green areas in urban areas as per NRR	Green areas in urban areas as designated by the Article 14(4) of the NRR option a) or option b)
ECOCON_01_01D	Green areas in urban areas as per NRR limited to ECO01	Green areas in urban areas as designated by the Article 14(4) of the NRR option a) or option b) limited to the extent of ecosystem type 1 'Settlements and other artificial areas'
ECOCON_01_01E	Total national area of urban green space (NRR)	Total national area of urban green space
ECOCON_01_02A	Concentration of PM2.5 in city LAUs	Concentration of particulate matter (PM2.5) in city LAUs
ECOCON_02_01A	Cropland SOC - all soils (topsoil 30 cm)	Cropland soil organic carbon stock in topsoil (30 cm; all soils)
ECOCON_02_01B	Cropland SOC - mineral (topsoil 30 cm)	Cropland soil organic carbon in topsoil - mineral soils (30 cm; mineral)
ECOCON_02_01C	Cropland SOC - organic (whole depth)	Cropland soil organic carbon in organic soils (whole depth)
ECOCON_02_01C1	Cropland SOC - organic (soil 100 cm)	Cropland soil organic carbon in organic soils (100 cm)
ECOCON_02_01C2	Cropland SOC - organic (topsoil 30 cm)	Cropland soil organic carbon in topsoil - organic soils (30 cm; organic)
ECOCON_03_01A	Grassland SOC - all soils (topsoil 30 cm)	Grassland soil organic carbon stock in topsoil (30 cm; all soils)
ECOCON_03_01B	Grassland SOC - mineral (topsoil 30 cm)	Grassland soil organic carbon in topsoil - mineral soils (30 cm; mineral)
ECOCON_03_01C	Grassland SOC - organic (whole depth)	Cropland soil organic carbon in organic soils (whole depth)
ECOCON_03_01C1	Grassland SOC - organic (soil 100 cm)	Cropland soil organic carbon in organic soils (100 cm)
ECOCON_03_01C2	Grassland SOC - organic (topsoil 30 cm)	Cropland soil organic carbon in topsoil - organic soils (30 cm; organic)
ECOCON_02-03_02	Common farmland bird index	Common farmland bird index (composite for Cropland and Grassland)
ECOCON_04_01	Common forest bird index	Common forest bird index
ECOCON_04_02A	Deadwood	Deadwood in Forest and woodland
ECOCON_04_02A1	Deadwood - standing	Deadwood - standing
ECOCON_04_02A2	Deadwood - lying	Deadwood - lying
ECOCON_04_03	Tree cover density	Tree cover density in Forest and woodland



ECOCON 11 01	Artificial impervious cover in coastal zone (1 km)	Share of artificial impervious area cover in coastal zone (1 km)
ECO01	Settlements and other artificial areas	
ECO02	Cropland	
ECO03	Grassland	
ECO04	Forest and woodland	
ECO05	Heathlands and shrub	
ECO06	Sparsely vegetated ecosystems	
ECO07	Inland wetlands	
ECO08	Rivers and canals	
ECO09	Lakes and reservoirs	
ECO10	Marine inlets and transitional waters	
ECO11	Coastal beaches, dunes and wetlands	
ECO12	Marine ecosystems	