European Commission

Study on budget tracking of CAP contribution to climate change, biodiversity and clean air action

Final report

Written by AND International, ADE, ICF, AFC,
with the support of Thünen Institute
August - 2025

EUROPEAN COMMISSION

Directorate-General for Agriculture and Rural Development

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European Commission
B-1049 Brussels

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2026

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Manuscript completed in August 2025

1st edition

Luxembourg: Publications Office of the European Union, 2026

PDF ISBN 978-92-68-28868-9 doi:10.2762/0410476 KF-01-25-017-EN-N

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Abstract

The European Commission is committed to tracking the expenditure of public money on climate, biodiversity and clean air. Some limitations have been highlighted in the current methodologies used to track CAP expenditure, and this study aims to provide recommendations on alternative methodologies.

The approach considered in this study is based on the identification of the farming practices linked to the different CAP interventions and on the assessment of the impacts of these practices on the environment and climate. It allows for higher granularity compared to the current methodology, greater use of scientific evidence, and harmonisation of the different methodologies. However, some limits remain due to the challenges in assessing the impacts of all CAP interventions at the EU level with a methodology reproducible each year.

Based on the methodology developed in this study, 33% of the CAP interventions are positive for climate (versus 41% with the current methodology), 39% are positive for biodiversity (versus 17%), and 21% are positive for clean air (versus 1%). Budget tracking methodologies only assess positive impacts (negative impacts are not considered); thus, these data must be considered with caution and do not reflect the complete picture of CAP impacts on the environment and climate.

Résumé

La Commission européenne s'est engagée à suivre les dépenses publiques consacrées au climat, à la biodiversité et à la qualité de l'air. Certaines limites ont été mises en évidence dans les méthodologies actuelles utilisées pour suivre les dépenses de la PAC et cette étude vise à fournir des recommandations sur des méthodologies alternatives.

L'approche envisagée dans cette étude est basée sur l'identification des pratiques agricoles liées aux différentes interventions de la PAC et sur l'évaluation des impacts de ces pratiques sur l'environnement et le climat. Elle permet une plus grande granularité par rapport à la méthodologie actuelle, une meilleure utilisation des données scientifiques et une harmonisation des différentes méthodologies. Cependant, certaines limites subsistent en raison des difficultés à évaluer les impacts de toutes les interventions de la PAC au niveau de l'UE avec une méthodologie reproductible chaque année.

Sur la base de la méthodologie développée dans cette étude, 33% du budget de la PAC sont positifs pour le climat (contre 41% avec la méthodologie actuelle), 39% sont positifs pour la biodiversité (contre 17%) et 21% sont positifs pour la qualité de l'air (contre 1%). Les méthodologies de suivi budgétaire n'évaluent que les impacts positifs (les impacts négatifs ne sont pas pris en compte) ; ces données doivent donc être considérées avec prudence et ne reflètent pas l'ensemble des impacts de la PAC sur l'environnement et le climat.

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List of abbreviations

AECC	Agri-Environmental-Climate Commitments
AECMs	Agri-Environment-Climate Measures
ANC	Area facing natural or other area-specific constraints
APR	Annual performance report
ASD	Area with specific disadvantages
BISS	Basic income support for sustainability
CAP	Common Agricultural Policy
CBD	Convention on Biological Diversity
CC	Climate change
CCA	Climate change adaptation
CCM	Climate change mitigation
CEF	Connecting Europe Facility
CF	Cohesion Fund
CIS	Coupled income support
CIS-YF	Complementary income support for young farmers
CPR	Common Provisions Regulation
CRISS	Complementary redistributive income support for sustainability
CSIC	Spanish National Research Council
CSPs	CAP strategic plans
DAC	Development Assistance Committee
DG	Directorate-General
DG AGRI	Directorate-General for Agriculture and Rural Development
DG BUDG	Directorate-General for Budget
DG CLIMA	Directorate-General for Climate Action
DG ENV	Directorate-General for Environment
DG REGIO	Directorate-General for Regional and Urban Policy
DIB	Disaggregated data on interventions and beneficiaries
DP	Direct payment
DME	Data for Monitoring and Evaluation
DNSH	Do No Significant Harm
EAFRD	European Agricultural Fund for Rural Development

EAGF	European Agricultural Guarantee Fund
ECA	European Court of Auditors
EEA	European Environmental Agency
EEH	European Evaluation Helpdesk
EFA	Ecological Focus Area
EMFAF	European Maritime, Fisheries and Aquaculture Fund
EMFF	European Maritime and Fisheries Fund
ENVCLIM	Environment-climate commitments
OECD	Organisation for Economic Co-operation and Development
ERDF	European Regional Development Fund
ESF+	European Social Fund Plus
EU	European Union
EUR	Euro
FADN	Farm accountancy data network
FGD	Focus group discussion
FP	Farming practice
FPEL	Farming practices evidence library
GAEC	Good agricultural and environmental condition
GMO	Genetically modified organism
IEEP	Institute for European Environmental Policy
IPA	Instrument for pre-accession assistance
JRC	Joint Research Centre
JTF	Just Transition Fund
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale (Links between the rural economy and development actions)
LIFE	Programme for environment and climate action
LUCAS	Land use / cover area frame survey
MS	Member state
MFF	Multiannual financial framework
NEC Directive	National Emission Reduction Commitments Directive
NDICI	Neighbourhood, Development and International Cooperation Instrument
PMEF	Performance monitoring and evaluation framework
PM	Particulate matter
RD	Rural development

RRF	Recovery and resilience facility
RRP	Recovery and Resilience Plan
SMR	Statutory management requirements
SO	Specific objective
SQ	Study question
UAA	Utilised agricultural area
UAC	Unit amount code
UN	United Nations
UNFCCC	United Nations Conference Framework Convention on Climate Change
WFD	Water Framework Directive
WP	Work package

Country and Region Abbreviations

AT	Austria
BE	Belgium
BE-FL	Flanders (Belgium)
BE-WL	Wallonia (Belgium)
BG	Bulgaria
CY	Cyprus
CZ	Czechia
DK	Denmark
DE	Germany
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxemburg
LV	Latvia
MT	Malta
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia

Glossary of terms

Agri-Environment-Climate Commitments (AECC)	Any one of a set of optional practices going beyond the usual environmental requirements and entitling farmers to payment from the EU budget.
Area of Natural Constraints (ANC)	Areas where farming is more difficult due to unfavourable conditions such as altitude, slope, dryness, low temperature, unfavourable texture, and stoniness.
Budget Tracking	Tracking the expenditure of public money to ensure coherence with policy objectives.
Climate Change	Changes in the Earth's climate that result in new long-term weather patterns.
Climate Change Adaptation (CCA)	Reducing the vulnerability of countries and communities to climate change by increasing their ability to absorb its impacts.
Climate Change Mitigation (CCM)	Reducing or limiting the emission of greenhouse gases due to their effect on the climate.
Cohesion Fund (CF)	An EU fund for reducing economic and social disparities in the EU by funding investments in Member States (MS) where the gross national income per inhabitant is less than 90 % of the EU average.
Common Agriculture Policy (CAP)	An EU policy comprising subsidies and a range of other measures designed to guarantee food security, ensure a fair standard of living for the EU's farmers, promote rural development and protect the environment.
Conditionality	A set of environmental and climate-related requirements that farmers must meet to receive full payments under the CAP. It includes statutory management requirements (SMRs), which apply to all farmers whether or not they receive support under the CAP and standards for good agricultural and environmental conditions of land (GAEC), which apply only to farmers receiving support under the CAP.
Connecting Europe Facility (CEF)	An EU Fund established in 2014 for infrastructure investments in transport, energy, digital and telecommunication projects, which aims to promote greater connectivity between EU MS.
Direct Payment (DP)	An agricultural support payment, such as area-related aid, made directly to farmers.
Eco-schemes	Practices that minimise the negative impact of agriculture on the environment and climate, improve animal welfare, and combat antimicrobial resistance.
EU Markers	The EU markers, adapted from the OECD's Rio markers, aim to assess the extent to which EU budget expenditures contribute to cross-cutting policy objectives, such as climate action, biodiversity, or clean air. Based on its expected contribution to a specific objective (SO), a marker (typically 0%, 40% or 100%) is assigned to an expenditure, enabling performance-based budget planning and transparent reporting.
European Agricultural Fund for Rural Development (EAFRD)	The EAFRD finances the EU's contribution to rural development programmes (RDPs), which consist of measures and projects that contribute to the EU-wide objectives of improving the competitiveness of agriculture, encouraging sustainable management of natural resources and climate action and achieving a balanced territorial development of rural economies and communities.
European Regional Development Fund (ERDF)	An EU fund that strengthens economic and social cohesion in the EU by financing investments that reduce imbalances between its regions.

European Maritime Fisheries and Aquaculture Fund (EMFAF)	An EU programme that runs from 2021 to 2027 and supports the EU common fisheries policy (CFP), the EU maritime policy and the EU agenda for international ocean governance.
GAEC	The standards of good agricultural and environmental conditions (GAECs) have been developed to complement the SMRs in the environmental and climate area, addressing a need in the context of agriculture.
Green interventions	Interventions in support of the environment, climate and animal welfare, including eco-schemes, AECC, etc.
Horizon Europe	The EU's research and innovation programme for 2021-2027.
InvestEU	An EU programme that boosts investment, innovation and job creation in Europe.
Multiannual Financial Framework	The EU's spending plan sets priorities (based on policy objectives) and ceilings, under six main headings, generally for seven years. It provides the structure within which annual EU budgets are set, limiting spending for each category of expenditure. The current MFF covers 2021-2027.
Natura2000	Network of conservation areas for rare and threatened species, and some rare natural habitat types protected under EU law.
NextGenerationEU	A funding package to help EU MS recover from the economic and social impact of the COVID-19 pandemic.
Recovery and Resilience Facility (RRF)	Temporary instrument under NextGenerationEU to implement ambitious reforms and investments by MS.
Rio Conventions	Three agreements resulting from the United Nations' 1992 Earth Summit in Rio de Janeiro: the Convention on Biological Diversity, the Framework Convention on Climate Change and the Convention to Combat Desertification.
Rio marker	An indicator, defined by the OECD, of the extent to which an activity contributes to the objectives of the Rio Conventions.
Rural Development Programme (RDP)	A set of national or regional multiannual objectives and actions, approved by the Commission, for the implementation of EU rural development policy.
Statutory Management Requirement (SMR)	A set of legal requirements based on EU legislation covering public health, animal health, plant health, environment, and animal welfare, which farmers must comply with to receive full CAP payments. SMR and GAEC are complementary components of the conditionality framework

List of CAP Specific objectives (SOs)

SO1	Support viable farm income and resilience across the Union to enhance food security
SO2	Enhance market orientation and increase competitiveness
SO3	Improve the farmers' position in the value chain
SO4	Contribute to climate change mitigation and adaptation, as well as sustainable energy
SO5	Foster sustainable development and efficient management of natural resources such as water, soil and air
SO6	Contribution to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes
SO7	Attract young farmers and facilitate business development in rural areas
SO8	Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry
SO9	Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare
CCO	In addition, a cross-cutting objective aims at fostering knowledge, innovation and digitalisation in agriculture.

List of relevant indicators

R12	Adaptation to climate change
R13	Reducing emissions in the livestock sector
R14	Carbon storage in soils and biomass
R15	Renewable energy from agriculture, forestry and other renewable sources
R16	Investments related to climate
R17	Afforested land
R18	Investment support to the forest sector
R19	Improving and protecting soils
R20	Improving air quality
R21	Protecting water quality
R22	Sustainable nutrient management
R23	Sustainable water use
R24	Sustainable and reduced use of pesticides
R25	Environmental performance in the livestock sector
R26	Investments related to natural resources
R27	Environment/climate-related performance through investment in rural areas
R28	Environmental or climate-related performance through knowledge and innovation
R29	Development of organic agriculture
R30	Supporting sustainable forest management
R31	Preserving habitats and species
R32	Investments related to biodiversity
R33	Improving Natura 2000 management
R34	Preserving landscape features
R35	Preserving beehives

1. Introduction

This document is the final report in the context of the request for service “Study on budget tracking of the common agricultural policy contribution to climate change, biodiversity, and clean air action” in the “framework contract for analytical services on environmental and climate aspects of agriculture, animal welfare, animal and plant health, and forestry”. It is submitted by a consortium led by AND International in partnership with ADE, AFC, and ICF.

The study has been implemented between November 2024 and August 2025.

The present report firstly introduces the context and objectives of the study. Then, the methodological chapter presents the approach to the study, particularly the alternative approaches proposed for budget tracking. Data sources are presented along with the limitations of the analysis. An answer to each of the 11 study questions (SQ) is provided, followed by conclusions.

The 11 SQs can be divided into five groups:

- SQ 1 to 3 aim at analysing the present and past tracking methodologies, for the common agricultural policy (CAP) and other EU funds.
- SQ 4 aims to estimate budgets from the current methodology contributing to climate change adaptation (CCA) and climate change mitigation (CCM).
- SQs 5 to 8 aim to analyse the contribution of Direct Payments (DPs) and Areas of Natural Constraints (ANCs) on climate change (CC), biodiversity and clean air.
- SQs 9 and 10 aim to analyse the contribution of green interventions on CC, biodiversity and clean air.
- SQ 11 aims to provide recommendations to improve the tracking of the CAP expenses.

2. Context and objectives

The European Commission is committed to track the expenditure of public money to ensure coherence with agreed policy objectives on three horizontal objectives: climate, biodiversity and clean air.

Budget tracking refers to a methodological approach aimed at identifying and quantifying CAP expenditures that may contribute to specific environmental objectives, namely climate, biodiversity and clean air. The tracking methodologies implemented at the European Union (EU) level, using EU markers, are inspired by the Organisation for Economic Co-operation and Development (OECD) Rio markers, with the use of 0% / 40% / 100% coefficients to reflect no contribution / moderate contribution / significant contribution, respectively. For the CAP tracking, the current methodologies differ for each horizontal objective. The methodology for climate is defined in Article 100 of Regulation (EU) 2021/2115, while *ad-hoc* methodologies have been developed for biodiversity and clean air by the Directorate-General for Agriculture and Rural Development (DG AGRI). Some critics raised concerns about the methodology implemented for climate tracking of the CAP, in particular on the lack of an evidence-based approach, the low granularity and possible over-estimation of the CAP contributions. In this context, this study aims to:

- assess the present and past (in the context of the current and previous Multiannual Financial Framework (MFF)) methodologies for tracking CAP expenditure contributions to actions concerning climate change, biodiversity, and clean air;
- provide recommendations to DG AGRI to improve the current methodologies for tracking CAP contribution to CC, biodiversity and clean air, in terms of use of scientific evidence and increased granularity of the assessment.

The conclusions elaborated in the framework of this study must be in line with the following principles:

- the methodology must be coherent with the EU tracking methodology:
  - based on EU markers (0%/40%/100%), even if additional weightings may be used;
  - only positive impacts are considered.
- the methodology must be reproducible by DG AGRI each year without requesting additional information from MS;
- the methodology must be achievable at the planning stage, with data available ex-ante.

These principles highlight that budget tracking of CAP spending differs from an evaluation of the impacts of the CAP (only positive impacts are tracked, with reproducible methodology, with data available at the planning stage). Thus, the

results of the tracking must not be understood as the result of an evaluation of CAP interventions.

Design of CAP strategic plans (CSPs)

CSPs have been built around the CAP specific objectives (SO) in response to MS's needs. CAP interventions are designed to contribute to one or more SOs (e.g. eco-schemes support environmentally and climate-friendly practices and income). In addition, MS had to link CAP interventions to PMEF result indicators.

PMEF result indicators provide a first comprehensive overview of the potential support to the three horizontal objectives (mainly in terms of Utilised Agricultural Area (UAA)). These include 24 result indicators (see list of relevant result indicators in the introduction). However, most interventions are designed to address multiple needs and specific objectives (SO), and MS had diverging approaches in assigning links.

3. Methodology implemented

This chapter starts with describing the approach to the implementation of the study (3.1), followed by the specific methodology applied for budget tracking (3.2).

3.1. Implementation of the study

The study has been implemented over 9 months, from November 2024 to August 2025. It has been followed by an inter-service steering group (ISSG) with representatives from DG AGRI, Directorate-General for Climate Action (DG CLIMA), Directorate-General for Environment (DG ENV), Directorate-General for Budget (DG BUDG) and the Joint Research Centre (JRC). The ISSG has met four times: for the kick-off of the study, to discuss the inception report, the interim report and, the draft final report.

As requested in the terms of reference of this study, a set of work packages (WPs) has been developed, namely:

- WPs related to the implementation of the study and analytical work.
  - inception and structuring;
  - analytical activities, findings, and conclusions;
  - establishing data collection strategy and guidelines;
  - methods for synthesis of existing evidence;
- WPs for focus group discussions (FGDs): online and hybrid;
- WPs for deliverables: executive summary, publishable final report and methodology report.

Three FGDs took place in the context of this study:

- on the 25th March 2025, to identify the contribution of interventions to CCA and CCM (hybrid: Brussels and online);
- on the 12th June 2025, for the validation of the budget tracking methodology (online);
- on the 27th June 2025, for the validation of the findings (online).

The FGDs involved academics and experts on the CAP, budget tracking, environment and climate. These FGDs provided feedback on the methodology and results, allowing:

- to improve the methodology: identification of sources of information and fine-tuning of some assessments;
- to identify limits and weaknesses in the methodology: this led to changes in the methodology and to disclaimers on the results when significant limits on the methodology were identified without a methodological alternative.

More details are provided in Annex 1.

3.2. Methodology applied to develop an alternative method for budget tracking

This section presents the proposed alternative methodology to improve budget tracking related to the three horizontal objectives.

CAP interventions in CSPs are designed to contribute to the CAP's specific objectives and are explicitly linked to them. Considering the environmental and climate interventions relevant for this budget tracking, the content and types of interventions vary significantly from one CSP to another, reflecting specific contexts and issues. MS do, however, provide descriptions of the farming practices (FP) in chapter 5 of the CSPs. The Joint Research Centre (JRC) made a classification of the practices supported by Member States in their CSPs[1]. All CAP interventions supporting environmentally and climate-friendly practices were labelled as FPs.

Specific approaches have been developed in this study for each type of intervention, mainly based on FPs (for those labelled into FP in CSPs) and on FADN data (for main interventions not labelled as FP), to account for these specificities as described hereafter.

[1] The description of interventions in CSPs differs a lot between MS regarding activities supported in relation to environmental, climate and animal welfare. For this reason, a common classification based on farming practices described in chapter 5 of CSPs was provided by the JRC.

3.2.1. Methodology by types of interventions

Direct payments (excl. eco-schemes)

For DPs (excl. eco-schemes), only GAECs are labelled as FPs. Thus, two approaches have been combined, while considering double-counting:

- identification of “positive farming systems”, regarding CC, biodiversity and clean air, namely organic farming, low-input systems and extensive grazing, and contribution of this support, mainly based on FADN data;
- contribution through GAECs (based on FPs).

The analyses for DPs (excl. eco-schemes) are developed in SQs 5, 6, 7 and 8.

Areas of Natural Constraint (ANC)

ANC are not labelled into FP. For ANC, the approach is based (as for DPs) on the contribution provided by the support of “positive farming systems” regarding CC, biodiversity and clean air, namely organic farming. The analyses for ANC are developed in SQs 5, 6 and 8.

Eco-schemes, AECC, green investments

The approach is based on a) the classification and identification of the FP covered by each of the interventions, and b) an assessment of the contribution of these different FP to CC, biodiversity and clean air. The classification allows to determine the potential contributions to environmental and climate objectives in a more precise way, based on scientific references and meta-analysis. The latter is supported by the JRC farming practice evidence library (FPEL)[2]. The Agri-food data portal allows to establish links between interventions and the FP (or group of FPs) of the sub-intervention at the unit amount code level.

Green sectoral interventions

The contribution of green sectoral interventions relies on ring-fencing requirements.

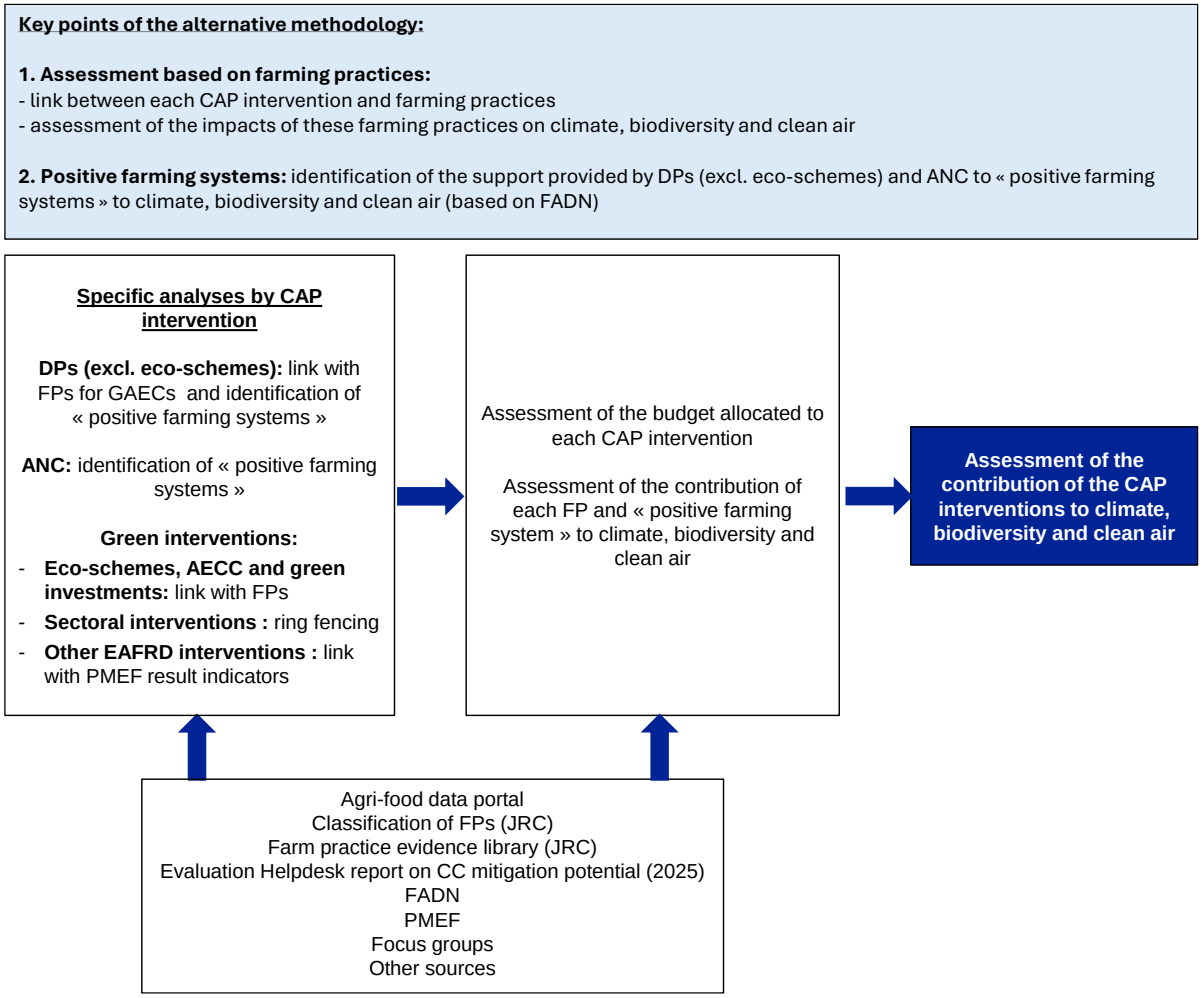
[2] https://datam.jrc.ec.europa.eu/datam/mashup/JRC_FP_EVIDENCE_LIBRARY/index.html

EAFRD interventions other than AECC, investments and ANC

The contribution relies on links with the 24 PMEF result indicators according to the horizontal objective (climate, biodiversity, clean air).

The general approach for the study is summarised in the following figure.

Figure 1 - General approach for the study



Source: Study team

As detailed in section 2, the methodology developed in the context of this study must comply with the principles of budget tracking:

- the methodology must be coherent with the EU tracking methodology:
  - based on EU markers (0%/40%/100%), even if additional weightings may be used;
  - only positive impacts are considered.
- the methodology must be reproducible by DG AGRI each year without requesting additional information from MS;
- the methodology must be achievable at the planning stage, with data available ex-ante.

3.2.2. Concrete application of the farming practices' approach

The study team elaborated a "database" (*excel)* on FPs based on the following information sources:

- JRC classification of FPs already mentioned above;
- the synthesis of numerous meta-analyses conducted in the framework of the JRC FPEL project;
- additional information collected through desk research.

Within the JRC classification, a total of 367 practices are labelled on a three-tiered architecture: from tier 1 practices, being the most general, to tier 3 practices, the most detailed. Tier 2 and 3 are sub-components of Tier 1 and 2, respectively. Among the different FPs:

- 45 FPs belong to tier 1,
- 166 FPs belong to tier 2,
- 157 FPs belong to tier 3.

For each environmental horizontal objective studied (CCM, CCA, biodiversity and clean air), the impacts studied were as follows, where applicable:

- biodiversity: ecotoxicity, pollination (unless 'biodiversity' is available), soil biological quality;
- CCM: Greenhouse Gas (GHG) emissions, global warming potential, energy use, carbon sequestration;
- CCA: soil erosion, water footprint, water use, soil physio-chemical quality (where applicable, e.g. soil drainage capacity, soil water retention);
- clean air: air pollutant emissions.

To evaluate the impact of each FP on CCA, CCM, biodiversity and clean air, the JRC FPEL [3] was used. The FPEL is an online library developed by the JRC, systematically reviewing available synthesis papers (including both meta-analyses and systematic reviews) and qualitatively assessing the impacts of 34 broad FPs on the environment and climate. These broad FPs cover 244 of the FPs identified in the JRC classification, and mostly gather at least tier 1 practices[4], as well as various tier 2 and tier 3 FPs.

For each FP impact, the JRC FPEL provides a qualitative synthesis of the impact of each FP considered, along with the number of synthesis papers supporting a positive, negative, or non-significant impact. Below is an example of the assessment of “No-tillage and reduced tillage” on “air pollutants emissions” (clean air).

Figure 2 - Example of the JRC FPEL's assessment of the impact of "No-tillage” on air pollutants emissions

Specific farming practice	Comparator practice	Impact: specific metric	Characteristics of the original data: specific conditions	Effect
No tillage	Conventional tillage	NO emission	Cropping systems.	Significant Positive

Source: JRC FPEL

Based on the information provided by the JRC FPEL, the study team defined a score for each FP between 0, 1a, 1b, 1c, 2, on a case-by-case basis. When no information was found, the “na” score was attributed. The scoring is detailed in the following table.

Table 1 - Description of the scores for the FP database

Score	Description
0	No or low contribution
1a	Intermediate or indirect contribution
1b	Significant contribution but context dependent
1c	Ambiguous contribution (possible positive and negative contribution)
2	Significant and direct contribution
na	No available information

When all synthesis papers did not report the same results, the score was lowered, depending on the topic and was in most cases attributed a 0 or 1c score.

[3] (European Commission. Joint Research Centre., 2025)

[4] CSP’s FP identified by the JRC included in its inventory and not covered by the JRC FPEL at tier 1 level concern certification schemes (CX), assessment and management plans (DX) and training (TX).

When no information was available for a specific FP at tier 1 or 2 levels, the score of the FPs at a lower tier was used (which means that the scores of FPs at the tier 2 level could be used to estimate a score at the tier 1 level).

For some FPs, when the JRC FPEL was missing detailed information, additional investigation was conducted by reviewing the synthesis papers referenced by the FPEL.

For FPs highly relevant in the context of this study (frequently linked to some CAP interventions) but not covered by the FPEL tool, additional desk research was conducted and is referenced in the bibliography.

80% of the tier 1 FPs were attributed a score for at least one of the horizontal objectives studied; for the rest of the tier 1 FPs, there was no information available or the FP was not relevant for this study (for instance, FPs on certification schemes). A score was attributed to 65% of the tier 2 FPs and 64% of the tier 3 FPs, within the limits of current research results.

This scoring was used to define a weighting for each FP for budget tracking (based on EU coefficients 0% / 40% / 100%). This weighting is then applied to the budget allocated to each CAP intervention (see the methodology for each intervention in the SQs).

Table 2 - Intervention scores and corresponding EU coefficients

Intervention Score based on FP	EU coefficient
2	100%
1 (a, b, c)	40%
0	0%
na	0%

Source: Study team

All in all, he following FPs (based on the JRC classification) were identified as having an impact (score of 2 or 1) on each horizontal objective.

For climate mitigation:

- Several livestock management practices, such as the use of feed (A14, A15X), improved housing conditions (A5X) and other animal welfare practices (A6), are expected to have a positive impact on CH4 emissions. Grazing management practices (G1X) and grassland management (G2X) have a positive impact on organic carbon in soils.
- FP related to the management of fertilisation and soil amendments (F111-F113, F211, F213, F214, F216-F218, F232, F31X, F411, F412, F42X, F44-F46) are expected to have a positive impact on carbon sequestration and the reduction of GHG emissions with positive effects on soil organic carbon and/or decrease of CH4, CO2, and N2O emissions.
- Hedgerows (L11-L112), field margins (L121-L122), agroforestry (L3X), wetland and peatland maintenance, conservation and restoration (L51X, L52X), afforestation (Y1X), and forest management (Y2X) have a positive impact on carbon sequestration.
- FPs related to manure (M11, M114, M115, M118), composting (M12X), anaerobic digestion (M13X) and solid-liquid separation (M141) are expected to have a positive impact on GHG emissions in CO2 equivalent, CH4 and N2O.
- Organic farming (OX) has a positive impact on the reduction of GHG emissions due to the absence of the use of mineral fertiliser and pesticides, and higher soil organic matter compared to conventional farming.
- Crop rotation and crop diversification (R1X), tillage management (S1X), and soil cover (S2X) increase carbon storage in soils in comparison to conventional cultivation.

For climate change adaptation, FPs address diverse climate impacts:

- Assessment and management plans linked to CCA (D12, D21, D23) and precision agriculture (E1X) contribute to addressing extreme climate events and improving the resilience of agriculture.
- Fertilisation practices to reduce nutrient losses (F2X), amendment with biochar (F31X), use of green manure (F44) and use of compost (F46) increase soil health and increase resistance to erosion, heavy rain, wind and extreme climate events.
- Grazing and grassland management practices (G12, G132, G21, G2X) help maintain ground cover, increase carbon sequestration, reduce soil erosion and improve water retention, thereby increasing ecosystem resilience to CC.
- Hedgerows (L11X), field margins (L12X), wetlands and peatland (L141, L142, L5X), terraces (L19X), the presence of unproductive areas/strips (L2X), agroforestry (L3X) and paludiculture (L53) increase resilience to drought, improve water retention, reduce fire risks (e.g. L221) and increase resilience to invasive species.
- Organic farming improves soil health, water retention capacity and can contribute to greater crop diversification, thereby increasing resilience to CC.

- Crop rotation and crop diversification (R1X), tillage management (S1X), cover crops (S2X) and other practices to combat erosion (S4) improve soil health and water retention capacity, thereby increasing resilience to droughts and floods.
- Water management (W1X) can increase resilience to droughts and improve water retention.
- Measures against the spread of invasive species (Z13) can increase resilience to pests and diseases.

For biodiversity, the following FPs are relevant:

- Practices contributing to pollination (A7X Beekeeping).
- Practices related to planning and input management (D11, D2X, E111, E1X, F11X, F12X, F14) contribute to reducing environmental pressures by managing pesticides, nutrients, using variable rate technologies and limiting fertiliser inputs to protect soil, water and surrounding biodiversity.
- Grassland and livestock management (G1X, G2X) contribute to preserving grasslands and promote extensive grazing, mowing restrictions, and habitat conservation, which support diverse flora and fauna.
- Landscape and habitat features (L1X, L2X, L3X, L4X, L5X, L6X, L7X) involve the creation/maintenance of hedges, trees, ponds, wetlands and other features, enhancing habitat connectivity and ecological niches for wildlife.
- Agroecological practices (M131, OX, P1X, P2X, P3X, R11, R121, R122, R13X, R14, S1X, S2X) increase soil cover, reduce chemical use and diversify crops, thereby improving the habitats and diversity of species.
- Forestry and conservation measures (W11, Y1X, Y2X, Z1X, Z2X) support biodiversity through sustainable forest management, afforestation, conservation of crop and local livestock species and wildlife.

For clean air, the following FPs are relevant:

- The ban or restriction on pesticide and fertiliser use (E111, E112, F12X, F211-F219, F221, F323, F411, F232, F411, F413, F46, OX, P22-P24), which are expected to have a positive impact on the reduction of NH3 and NO emissions.
- Manure management FPs (M111- M114, M121, M113, M114, M121, M122, M131-M133), which are expected to have a positive impact on NH3 emissions.
- Grassland and grazing management practices (i.e., G25 ban on ploughing grassland and G28 bans or restriction(s) on grazing, mowing, and ploughing of grassland in limited areas of the field other than along watercourses), which are expected to have an impact on NO emissions.
- Soil management practices such as low or no tillage (S1X), no burning of crop residues (S24), which are expected to have an impact on NO emissions and other pollutants (NH3, NMVOC, SO2, etc.).
- Improved livestock feeding strategies (A1X) such as restrictions on silage (A11) and feed additives (A14), which are expected to improve diets and tend to decrease N excretions and emissions.

- Improved litter and indoor flooring for animals (A53), which are expected to decrease NH3 emissions, e.g. compared to the use of slatted floors.

3.2.3. Main data sources and literature used for desk research

A variety of sources and tools were utilised to conductthis study. Details on their application are provided for each step of the approach for all SQs. The main sources used in the context of this study are:

- The Agri-food data portal[5] and two of its components. The Catalogue of CAP interventions, set up by DG AGRI, was used to track CAP planned expenditures in detail (per MS, macro-type, specific objective (SO), type of intervention, etc.). Spending data (APR) was used to estimate data not available at the unit amount code (UAC) level. The performance monitoring and evaluation framework (PMEF) Data Explorer was used to explore the CAP monitoring and evaluation system.
- Database of FPs (Angileri, 2024)[6] developed by JRC, which mapped the different FPs used in the CAP Strategic Plans (CSPs).
- JRC FPEL, which synthesises scientific meta-analyses' results, to assess the impact of FPs on climate, biodiversity and clean air.
- CSPs to collect specific information on interventions when needed.
- Individual data from FADN (provided by DG AGRI under confidentiality rules) to estimate the CAP payment for different farming systems.
- Reports and studies from different EU sources: The Commission (tracking methodologies e.g. in Annex 4 of the 2020 NEC Directive Implementation Report and on the dedicated webpages of DG BUDG, implementation reports), the EU CAP Network, the European Environmental Agency (EEA), etc.
- Other research or reports on the impact of FPs and tracking methodologies from universities, research institutes, etc.

[5] https://agridata.ec.europa.eu/extensions/DataPortal/pmef_indicators.html

[6] (Angileri, Guerrero, and Weiss, 2024)

3.2.4. Limitations

Limitations of the budget tracking exercise

Budget tracking follows a set of principles which have an impact on the final results. Tracking CAP spending is therefore very different from an evaluation of the CAP interventions, and the results must be understood with these methodological precautions in mind.

Budget tracking methodology must follow specific principles: coherence with other funds, use of EU markers (0%/40%/100%), use of data available at the planning stage, track positive impacts only, and reproduce the methodology each year.

Data gaps

Data on interventions - Agri-food data portal

Data on interventions is available on the Agri-food data portal. Three main sources of data were used: the “Catalogue of CAP interventions”, the “Planning by intervention unit amount” database and the “FP database”. These datasets present the following limitations:

- The “Catalogue of CAP interventions” shows the budget planned per MS intervention as well as its links to SO and PMEF indicators. When assigning result indicators to interventions, MS had relative flexibility: some used a conservative approach (linking interventions to a few but most relevant indicators) while others linked interventions to a broader range of indicators. This means that their heterogeneous approach is translated into the data and may lead to biases.
- Data provided in the “Planning by intervention unit amount database” presents data at the planning stage. Data on targeted output indicators, such as areas (in ha) is sometimes not available depending on intervention design in the CSPs. In this case, the budget for an intervention unit amount was roughly estimated based on alternative methods (see Annex 8).
- The “FP database” links each intervention at the intervention UAC level to all the FPs that can be implemented by farmers to get payments. This mapping was done for eco-schemes, Agri-Environmental-Climate Commitments (AECC) and investments which represent about 95% of the green interventions budget. However, it does not include other interventions (e.g. cooperation, sectoral interventions), thereby limiting the approach based on FPs to three interventions. In addition, the database does not specify whether all practices or only a set of these practices need to be

implemented by the farmer to get the payment. To verify whether the estimated contribution of interventions to the three horizontal objectives based on FPs is reliable, the team used a targeted approach to check the reliability of results as outlined in Annex 8.

Data on the support per intervention - ANC

Specific analyses have been conducted on ANC. The data analysis was based on spending data from the year 2022 (received from DG AGRI) and FADN individual farm data from the year 2022. Estimates for the current programming period (2023-2027) were then made using the data on planned expenditure and the estimated shares of contribution from the year 2022.

Gaps to estimate the impact of GAECs

The impact of GAECs has been estimated thanks to a recent study from the EU CAP Network. These estimates are based on a set of assumptions and hypotheses; their robustness could be improved if more detailed information were available. In addition, the impact of some GAECs could not be estimated due to significant data gaps, such as the agricultural surface under wetland and peatlands at the EU level. However, such information should be provided by MS to DG AGRI in the coming years.

Baseline for assessing the contribution of CAP interventions

While tracking methodologies are shifting from an intent-based to an effect-based approach, a baseline is needed to assess the contribution of the different interventions. The question of baseline is highly complex when it refers to the impact of CAP interventions. In the context of this study, the baseline refers to the situation that would have occurred if the analysed intervention had not been implemented during this programming period.

This type of assessment is related to counterfactual approaches. However, such methodologies are complex to implement, and corresponding results are not available for the various CAP interventions in the current programming period. Therefore, alternative sources were used to assess the impact of FPs (namely, the JRC FPEL portal and the method applied by the EU CAP Network to estimate the CC potential of the CSPs in the report titled “Rough estimate of the CC potential of the CSPs over the 2023-2027 period” [7]).

[7] (EU CAP Network, 2024). https://eu-cap-network.ec.europa.eu/publications/rough-estimates-climate-change-mitigation-potential-cap-strategic-plans-eu-27-over_en

In the context of this study, the assessment of the contribution of each intervention is based on the impact of the FP or farming systems it supports.

FGD members pointed out that some interventions, such as ANC, in certain mountain areas, may contribute to maintaining the farming activity. In such cases, the counterfactual situation could be land abandonment, which would generally be better for climate, biodiversity and clean air, but less beneficial for semi-natural habitats, farmland biodiversity, valued cultural landscapes, as well as food production and socioeconomic objectives. Within the context of this study, it was not possible to robustly estimate this phenomenon, particularly its magnitude in the agricultural sector and its impacts on climate, biodiversity, and air quality. As a result, this alternative scenario of land abandonment was not included in the analysis.

The baseline situation considered for organic farming is conventional farming. Some FGD participants also noted that the impact of organic farming (and other FPs based on extensifying land use), especially on CCM, varies depending on whether it is assessed in terms of area or product volume (with potential leakage effects). Given the complexity of assessing these leakage effects and the fact that support is areabased, the approach adopted in this study is to evaluate the impact of organic farming based on areas.

Assumptions on the impact of FPs

The analyses are based on the estimate of the impact of the different FPs, with an extensive use of the FPEL tool (JRC). The detailed methodology is provided in the specific section on the “database of FPs”. This approach allows to cover a wide range of FPs; however, a scoring with a scale of three levels (0, 1, 2) does not allow to capture highly balanced information. Indeed, in several cases, the impact of FPs is assessed to be context dependent or ambiguous (both positive and negative), and these two situations lead to the same scoring (1).

Assumptions based on ex-post data

The data available in the context of this study may cover the planned outputs for the current programming period (through the Agri-food data portal [8]) and past data. Past data, for instance, includes ANC spending and FADN data, for which the last year available was 2022 (2022 being in the previous programming period).

[8] https://agridata.ec.europa.eu/extensions/DataPortal/home.html

Different results when compared to current methodologies

The alternative methodology developed in the present study aims to be homogeneous for the three horizontal objectives (climate, biodiversity and clean air). The alternative approach developed in the context of this study is based on FPs, with a conservative assessment of their contribution to the three horizontal objectives.

This alternative methodology leads to a decrease in the CAP contribution to climate (compared to the current methodology) but, in a counter-intuitive way, to an increased contribution to biodiversity and clean air. These differences are related to highly different baselines, as the current methodologies are very different across the three horizontal objectives(see results from SQ 2).

4. General results on the CAP contribution to climate, biodiversity and clean air

This section provides general results on the contribution of CAP interventions on climate, biodiversity and clean air, based on the alternative methodology developed in the framework of this study. More details are provided in the following section, including in-depth answers by SQ, and in Annex 2.

Compared to the current methodology, the results of the alternative methodology developed in this study indicate:

- relatively homogeneous contributions among the three horizontal objectives (approximately 20% to 40% of positive contribution);
- strong differences in the contribution for each horizontal objective compared to the current methodology:
  - a lower contribution to climate;
  - a higher contribution to biodiversity and clean air.

These results are due to the fact that the current methodologies for each horizontal objective are highly different, with estimated contributions to climate above 40% and to clean air below 1%. The current methodology for climate is based on a weighting for each CAP intervention, while the current methodology for clean air is based on a selection of interventions, with a specific link to result indicators (see more details in the answer to SQ2).

The alternative approach developed in the context of this study is based on FPs, with a conservative assessment of their contribution to the three horizontal objectives. This methodology is based on FPs and is result-based, which means that the contribution of CAP interventions is assessed in relation to the FPs linked to each intervention, rather than the objectives set for each intervention. This is a significant shift compared to some current methodologies, where only the interventions related to a specific SO were covered.

The following table provides a comparison, for each horizontal objective, of the positive contribution of CAP payments estimated using the current methodology and the alternative methodology. With the alternative methodology, we observe a decrease in the positive contribution for climate (-22%) and a strong increase in biodiversity (+122%) and clean air (+3 192%).

Table 3 - Comparison between current and alternative approach – for the period 2023-2027 (in billion EUR)

		Current methodology*	Alternative methodology	% Change
Climate	**Positive contribution *(Billion EUR)***	111	87	-22%
	Positive contribution % of total EU planned exp	41%	33%	-
Biodiversity	**Positive contribution *(Billion EUR)***	45	101	+122%
	Positive contribution % of total EU planned exp	17%	39%	-
Clean air	**Positive contribution *(Billion EUR)***	2	53	+3 192%
	Positive contribution % of total EU planned exp	1%	21%	-

* The percentages indicated here for the current methodology are taken from the Programme Performance Statements with a total CAP budget amounting to EUR 268 bn for the period 2023-2027. In the context of the present study, the total CAP budget taken into account comes from the Agri-food Data Portal (EUR 256 bn for the period 2023-2027). This source was used because it provides the allocation of budget by intervention at national level. The difference between the two numbers is explained by the state of allocation of the budget to each intervention at MS level.

In order to provide comparable information between the current methodology and the alternative methodology, the calculation of the positive contribution percentage of the current methodology based on the CAP budget from the Agri-food Data Portal (EUR 256 bn) would be 43% for climate, 18% for biodiversity and 1% for clean air.

Source: Study team

Climate

Based on the alternative approach developed in this study, the positive contribution of CAP interventions on climate is 33% (compared to 41% with the current methodology). Main contributions are from eco-schemes (39% of the total positive contribution) and positive farming systems supported by DPs (excl. eco-schemes) (32%). The contribution is estimated at 31% for CCM and 30% for CCA. Detailed information by CAP interventions is provided in the table below.

Table 4 - Results of the alternative approach – Climate – for the period 2023-2027

CAP interventions	CC			
	Total EU planned exp. (in billion EUR)	Positive contribution (in billion EUR)	% (positive contribution / total EU planned exp.)	Breakdown of positive contribution by intervention
DPs (excl. eco-schemes) through positive farming systems	*143*	*27*	*19%*	*32%*
DPs (excl. eco-schemes) through GAECs	*127*	*4*	*3%*	*4%*
Total DPs (excl. eco-scheme)	**143**	**31**	**21%**	***36%***
ANCs	**10**	**3**	**29%**	***4%***
Eco-schemes	*44*	*33*	*75%*	*39%*
AECC	*21*	*15*	*69%*	*17%*
Green investments	*18*	*6*	*36%*	*7%*
Other interventions	*19*	*1*	*6%*	*1%*
Total green interventions	**103**	**55**	**54%**	***65%***
TOTAL CAP interventions	**256**	**87**	**33%**	***100%***

Source: Study team

Biodiversity

The positive contribution of CAP interventions on biodiversity is assessed at 39% with the alternative methodology (compared to 17% with the current methodology). Main contributions are from eco-schemes (38% of the total positive contribution) and positive farming systems supported by DPs (excl. eco-schemes) (36%). Detailed information by CAP interventions is provided in the table below.

Table 5 - Results of the alternative approach – Biodiversity – for the period 2023-2027

CAP interventions	Biodiversity			
	Total EU planned exp. (in billion EUR)	Positive contribution (in billion EUR)	% (positive contribution / total EU planned exp)	Breakdown of positive contribution by intervention
DPs (excl. eco-schemes) through positive farming systems	*143*	*36*	*25%*	*36%*
DPs (excl. eco-scheme) through GAECs	*127*	*4*	*3%*	*4%*
Total DPs (excl. eco-schemes)	**143**	**39**	**27%**	***39%***
ANCs	**10**	**4**	**39%**	***4%***
Eco-schemes	*44*	*38*	*86%*	*38%*
AECC	*21*	*17*	*79%*	*17%*
Green investments	*18*	*5*	*28%*	*5%*
Other interventions	*19*	*0,3*	*2%*	*0%*
Total green interventions	**103**	**60**	**58%**	***60%***
TOTAL CAP interventions	**256**	**100**	**39%**	***100%***

Source: Study team

Clean air

The positive contribution of CAP interventions on clean air is assessed at 21% (compared to 1% with the current methodology). Main contributions are from positive farming systems supported by DPs (excl. eco-schemes) (52% of the total positive contribution) and eco-schemes (29%). Detailed information by CAP interventions is provided in the table below.

Table 6 - Results of the alternative approach – Clean air – for the period 2023-2027

CAP interventions	Clean air			
	Total EU planned exp. (in billion EUR)	Positive contribution (in billion EUR)	% (positive contribution / total EU planned exp)	Breakdown of positive contribution by intervention
DPs (excl. eco-scheme) through positive farming systems	*143*	*27*	*19%*	*52%*
DPs (excl. eco-scheme) through GAECs	*127*	*2*	*1%*	*4%*
Total DPs (excl. eco-schemes)	**143**	**29**	**20%**	***56%***
ANCs	**10**	**3**	**29%**	***6%***
Eco-scheme	*44*	*15*	*34%*	*29%*
AECC	*21*	*6*	*30%*	*12%*
Green investments	*18*	*0,4*	*2%*	*1%*
Other interventions	*19*	*0,2*	*1%*	*0%*
Total green interventions	**103**	**22**	**22%**	***42%***
TOTAL CAP interventions	**256**	**52**	**21%**	***100%***

Source: Study team

5. Answers to study questions (SQs)

5.1. SQ1: What are the purpose, the main elements, differences of the current and past methods used to track the contribution of EU funds?

SQ1: What are the purpose, the main elements (including application of Rio and EU Markers) and differences of the current and past methods used to track the contribution of EU funds (other than the CAP) to climate (sub-question 1.1)? Biodiversity (sub-question 1.2)? clean air (sub-question 1.3)?

Key findings:

- Budget tracking methods for climate, biodiversity, and clean air have evolved significantly, with the 2021–2027 MFF introducing more formalised and differentiated approaches than in the 2014–2020 period.
- Climate tracking is the most established and institutionalised, featuring mandatory targets (30% of overall EU spending), consistent use of EU coefficients, and application across all major budget programmes.
- Biodiversity tracking has expanded in scope and visibility but lacks uniform implementation and legal obligations across all funds. The methodology borrows from climate tracking but remains less standardi d.
- Clean air tracking builds on lessons from climate and biodiversity methods and, while not linked to binding spending targets, is required by law.
- All three tracking systems use coefficient-based methodologies (0%, 40%, 100%) to estimate the share of budgetary contributions toward environmental objectives. However, in terms of granularity, governance, and consistency.
- Despite improvements in transparency and methodological structure, cross-fund comparability remains limited, particularly for biodiversity and clean air, where tracking is either non-binding or inconsistently reported.

5.1.1. Methodological approach

To answer SQ 1 and its three sub-questions, a structured comparative analysis of the EU's budget tracking systems was conducted, focusing on climate, biodiversity, and clean air spending across funds other than the CAP. The approach centred on examining how each environmental objective is addressed within the EU's MFFs for 2014–2020 and 2021–2027, including changes in methodology, application, and reporting. An overview of the funds considered in the analysis and their main characteristics (2021-2027 period) is detailed in Annex 3.

For each environmental objective, the following elements were examined:

- the purpose and strategic context of tracking;
- the methodology used to attribute expenditure to environmental objectives (e.g. marker-based or coefficient-based tracking);
- the coding and reporting framework applied (e.g. intervention fields, result indicators, thematic codes);
- fund-level implementation details;
- changes between the 2014–2020 and 2021–2027 MFFs.

The analysis relied on official documents from the Commission, including methodology papers, performance statements, legal texts, and evaluation reports, as well as scientific literature that addresses budget tracking for climate, biodiversity and/or clean air.

The analysis also acknowledges limitations: for instance, data for ex-post application of the clean air methodology to the 2014–2020 period is not comprehensive, and biodiversity tracking lacks complete harmonisation across programmes. These methodological and implementation differences were taken into account when comparing the three approaches.

5.1.2. Answer to the study question

5.1.2.1. SQ1.1 Climate: purpose and main elements of the budget tracking method of EU funds other than the CAP

Purpose of budget tracking for climate spending of EU funds other than the CAP

The purpose of budget tracking for climate spending is to quantify expenditures that contribute to climate objectives, ensuring that funds are allocated effectively to support CCA and CCM[9].

Main elements of climate budget tracking of EU funds (other than the CAP)

The Interinstitutional Agreement for the 2021–2027 MFF includes provisions to strengthen climate-related budgetary transparency. Article 16(d) introduces requirements for an annual report on climate expenditure and establishes a mechanism to adjust spending if progress towards the climate target is insufficient[10]. The Commission is required to prepare an annual report accompanying the Union's general budget, consolidating non-confidential information on climate expenditure. The report will differentiate between CCA and CCM where feasible. If progress towards the climate spending target is insufficient in any relevant programme, the institutions will consult each other to take appropriate measures to ensure that Union spending on climate objectives over the entire MFF 2021-2027 meets the 30% target.

In the 2021 Performance Communication, the Commission introduced a new methodology for the 2021-2027 MFF, using “EU climate coefficients”[11]. This methodology considers various financial management modes and fund allocation methods under the EU budget to ensure consistent climate tagging across all programmes, and the assignment of coefficients is based on the expected effects of the actions. Examples of these management modes include centrally managed funds, shared management, and financial instruments implemented by third parties. A new feature of this tracking system is the inclusion of financial instruments and budgetary guarantees, which track only the level of commitments from the EU budget, excluding additional funding from other sources.

[9] (European Commission, 2022)

[10] Interinstitutional Agreement between the European Parliament, the Council of the European Union and the European Commission of 16 December 2020 on budgetary discipline, on cooperation in budgetary matters and on sound financial management (OJ L 433I, 22.12.2020, p. 28), Article 16(d).

[11] (European Commission, 2021)

EU climate coefficients are categorised as follows:

- 100%: Activities expected to make a significant contribution to climate change mitigation or adaptation in line with EU climate goals. This can include direct contributions (e.g., renewable energy, zero-emission transport, or nature-based solutions) or indirect contributions (e.g., research and innovation, education related to clean technologies, or other enabling activities).
- 40%: Activities expected to make a non-marginal, positive contribution to climate change mitigation or adaptation. Contributions can be direct or indirect.
- 0%: Activities expected to have a neutral impact on climate objectives.

Tracking relies on an activity-based method where each type of intervention uses the same EU climate coefficient[12]. All EU budget programmes will use the same coefficient for the same type of intervention. The DGs responsible for specific funding programmes directly assign coefficients in the financial system. These coefficients are allocated at the most detailed level possible, based on the unique characteristics of each funding programme, to ensure comprehensive tracking[13]. The climate coefficients outlined in the Common Provisions Regulation (CPR) form the foundation of the tracking methodology and are applied to several shared management funds, including the European Regional Development Fund (ERDF), the European Social Fund Plus (ESF+), the Cohesion Fund (CF), the Just Transition Fund (JTF), and the European Maritime, Fisheries and Aquaculture Fund (EMFAF). The Recovery and Resilience Facility (RRF) and the Connecting Europe Facility (CEF) also align with the CPR weightings and use the same methodology for consistency.

The InvestEU climate tracking system is also using climate coefficients outlined in the CPR and includes additional intervention fields that match InvestEU's broader goals. Under the InvestEU Programme, implementing partners have the option to track climate contributions using either the InvestEU climate tracking methodology, which employs predefined coefficients aligned with the CPR, or by applying the EU Taxonomy criteria for substantial contribution. The choice between these methodologies affects the assigned climate contribution:

- InvestEU Climate tracking methodology: this approach uses fixed coefficients (e.g., 0%, 40%, 100%) assigned to specific intervention fields to estimate their contribution to climate objectives.
- EU Taxonomy Criteria: investments that meet the substantial contribution criteria under the EU Taxonomy are assigned a 100% climate contribution. If the criteria are not met, the contribution is set at 0%. Unlike the marker-

[12] (European Commission, 2022)

[13] (European Commission, 2022)

based approach, the Taxonomy does not utilise a 40% coefficient; an activity either qualifies as making a substantial contribution or it does not[14].

This dual approach allows implementing partners to select the methodology that best aligns with their investment strategies and reporting capabilities.

The appendix of the report *Climate Mainstreaming Architecture in the 2021-2027 Multiannual Financial Framework* includes a detailed table presenting interventions under the EU budget and the climate coefficients assigned to them. While there is a high degree of alignment in the methodologies used across major programmes, such as the CPR, the RRF, the CEF and InvestEU, there are some differences in scope and implementation. In general, similar types of interventions receive comparable coefficients across programmes, but the classification into intervention fields does not apply universally. Notably, this system is not used for some major contributors to climate spending, such as the CAP funds, Horizon Europe, and Neighbourhood, Development and International Cooperation Instrument (NDICI) - Global Europe. For activities not covered by the existing guidance, climate coefficients may be determined on a case-by-case basis using harmonised effect-based criteria. This approach aims to ensure consistency across programmes while allowing flexibility where direct mappings are not available. An "effect-based criteria" outlines specific benchmarks that interventions must meet to achieve the corresponding coefficient. These criteria are derived from the established methodologies of the CPR, RRF, CEF, and InvestEU, and reference CPR intervention fields where applicable to avoid repetition.

Further, in the current MFF 2021–2027, the application of the “Do No Significant Harm” (DNSH) principle varies across EU funding programmes[15]. Specifically, the DNSH principle is a mandatory requirement for the RRF and the CEF. For the RRF, each measure included in an MS's Recovery and Resilience Plan (RRP) must undergo an individual DNSH assessment to ensure it does not cause significant harm to any of the six environmental objectives outlined in the EU Taxonomy Regulation[16]. While the DNSH principle is also considered through funds under to the Cohesion Policy, such as the ERDF, CF, and the JTF, its application is not uniformly mandatory across all programmes. The InvestEU Fund incorporates DNSH considerations through sustainability proofing guidance[17]. Looking ahead, it is envisaged that the DNSH principle will be applied more broadly across all EU funds in the next MFF, where feasible and appropriate. This anticipated expansion aims to enhance

[14] (European Parliament and Council of the European Union, 2021; EU Commission, 2021)

[15] Introduced in Article 17 of Regulation (EU) No 2020/852 on the establishment of a framework to facilitate sustainable investment (EU Taxonomy Regulation), the DNSH principle requires that supported activities do not significantly harm any of the EU’s six environmental objectives.

[16] (European Commission, 2023)

[17] (European Commission., 2021)

consistency in environmental safeguards across EU funding instruments[18]. For some activities, EU climate coefficients are guided by taxonomy technical screening criteria. The technical screening criteria for climate mitigation and adaptation objectives are set out in Commission Delegated Regulation (EU) No 2021/2139[19]. This regulation identifies activities that significantly contribute to the EU's climate goals, such as investments in renewable energy and zero-emission transport[20]. It also includes the aforementioned DNSH criteria to exclude activities that, despite potentially benefiting climate objectives, are detrimental to water or marine resources, the transition to a circular economy, pollution prevention, or biodiversity.

Regarding climate mitigation, the regulation also encompasses "transition activities." These activities are deemed environmentally sustainable under specific conditions, particularly when low-carbon alternatives are not yet economically or technically viable, provided they do not result in the lock-in of carbon-intensive assets.

Comparison of climate tracking approaches in 2014-2020 and 2021-2027

The following table provides an overview of the methodologies implemented in 2014-2020 and 2021-2027. There have been major changes between the two programming periods: 1) a shift from an “intent-based” approach to a more “effect-based” approach, and 2) an increased objective for the EU spending related to climate: from 20% to 30%.

[18] European Commission (2024). Outlook on Mainstreaming Sustainability in the Future MFF. Internal working document. Brussels.

[19] Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or adaptation and for determining whether that activity causes significant harm to any of the other environmental objectives (OJ L 442, 9.12.2021, p. 1).

[20] (European Commission, 2021)

Table 7 - Comparison of EU budget tracking for climate in 2014-2020 and 2021-2027 for funds other than the CAP[21]

Topic	2014-2020	2021-2027
Overall objective	Identify and monitor climate-related expenditure to meet the 20% climate target and integrate climate goals across EU policies.	Ensure effective climate spending with a minimum 30% target (including Recovery Instrument), using stronger mechanisms and methodologies.
Strategic context	Linked to climate mainstreaming in EU spending; aligned with the OECD Rio markers of the Rio Conventions.	Framed under the Inter-Institutional Agreement, closely tied to the European Green Deal and taxonomy regulations.
Purpose	Monitor progress towards 20% climate spending / Promote climate integration across policy areas / Encourage MS climate investments.	Ensure allocation of at least 30% of EU and Recovery Instrument spending to climate goals.
Methodology type	Intent-based: based on whether the objective of the activity includes climate objectives.	More effect-based: based on expected contribution to climate goals and performance outcomes.
Marker system	Modified OECD Rio markers: - 100% (primary climate objective) - 40% (significant objective) - 0% (not climate-related)	EU climate coefficients: - 100% (significant positive contribution); - 40% (non-marginal, positive contribution); - 0% (neutral impact). Some programmes (e.g. InvestEU, parts of RRF) also apply EU Taxonomy-based climate tracking : - 100 % (substantial contribution); - 0% (no contribution).
Reporting mechanism	Internal tracking via performance statements is used for strategic guidance and accountability, and limited public reporting.	Annual public report accompanying the general EU budget; includes monitoring of performance and adjustment mechanisms if targets (30%) are not met.
Flexibility and correction	No formal adjustment mechanism if the target is missed.	Built-in Adjustment Mechanism: institutions must consult/adjust if insufficient expenditure.
Tracking level	Based on budget lines or intervention fields, with overarching indicative percentages applied across programmes.	Applied at the most detailed level available, typically intervention-field (e.g., within cohesion policy) or project level, providing consistent granularity across funds.
Governance of tracking	Developed and guided by Directorate-General for Climate Action (DG CLIMA) and DG BUDG, based on OECD Rio markers; implementation overseen by implementing DGs and MS authorities under shared management.	DG BUDG coordinates the EU climate coefficients based on DG CLIMA methodology; implementing DGs apply them directly in the financial and performance systems; oversight includes Commission coordination and audits.
Environmental safeguard	No overarching EU-level environmental safeguard applied across funds. Project-level safeguards (e.g. EIA) existed but were fragmented and programme-specific.	Introduction of the DNSH principle in major funds (e.g. RRF, InvestEU); required alignment with EU environmental objectives. Not applied uniformly across all programmes.

Source: Study team

[21] Neither the 2014–2020 nor the 2021–2027 tracking systems include a comprehensive outcome-based assessment. While selected programmes (e.g. Horizon Europe, InvestEU) introduced performance indicators, these remain partial and not systematically linked to measurable climate impact. (European Court of Auditors, 2022; Nesbit et al., 2020).

This analysis highlights key differences in climate tracking methodologies across the chosen EU funds. The comparison is summarised in the following table.

Table 8 - Comparison of the climate tracking methodologies for the 2021-2027 period for funds other than CAP

Funds	Level of granularity (based on the application level)	Details on the application level	Climate tracking methodology
Horizon Europe	High	Project/activity Level	Internal markers based on programme parts, refined through project-level tagging.
Programme for environment and climate action (LIFE)	High	Sub-programme / Action Level	EU climate coefficients; aligned with activity type.
RRF	High	Component-level tracking, via intervention fields (closely aligned with those of CF and ERDF). All measures must comply with the DNSH principle.	EU climate coefficients; aligned with CPR and Annex VI of RRF Regulation (EU) 2021/241. DNSH acts as an environmental safeguard but is not a tracking method itself.
CEF	High	Project-level tracking via predefined intervention types/actions; aligned with CPR intervention field structure where applicable.	EU climate coefficients, defined in Regulation 2021/1153, consistent with CPR Annex I. DNSH applies as an eligibility criterion.
InvestEU	High	Project or operation-level tracking. Implementing partners choose between: (1) EU climate coefficients or (2) EU Taxonomy-based approach.	Dual methodology: (1) EU climate coefficients based on predefined intervention fields (aligned with CPR); (2) Taxonomy-based method (100% or 0%) with DNSH check.
CF	Medium	Intervention field (within Policy Objectives)	EU climate coefficients, based on CPR Annex I and expected contribution.
ERDF	Medium	Intervention field (within Policy Objectives)	
EMFAF	Medium	Intervention type	EU climate coefficients listed in Annex IV of Regulation (EU) 2021/1139.
NDICI – Global Europe	Low	Programming documents (thematic area level)	Rio markers, allows for refined methods where available.
Instrument for pre-accession assistance (IPA) III	Low	Action level	Rio markers, applied across all sectors with a focus on climate-relevant actions.

Source: Study team

Methodology origin: EU climate coefficients vs. Rio markers

The 2021–2027 programming period sees a progressive shift from Rio markers towards a more refined and harmonised EU-specific tracking method using climate coefficients. These coefficients (0%, 40%, 100%) are applied based on the expected effects of interventions. EU climate coefficients are used by RRF, ERDF, CF, InvestEU, CEF, and EMFAF. These rely on categorised intervention fields and a standardised application method outlined in regulations like the CPR and RRF Regulation. The Rio marker system remains in use for external action instruments (NDICI, IPA III), where programme-level estimates dominate. Horizon Europe applies an internal, evidence-based system refined at the project level.

Application level of climate tracking

Funds differ significantly in the level at which climate tracking is applied:

- Project-level tracking (Horizon Europe, RRF, LIFE, CEF): allows for more accurate and refined monitoring of climate contributions, particularly in dynamic or innovative sectors.
- Intervention field level (ERDF, CF, InvestEU, EMFAF): structured and uniform, these rely on predefined intervention types with associated climate coefficients.
- Programming Level (NDICI, IPA III): offers strategic estimates based on thematic priorities and regional focus, but is less precise.

Alignment and methodological uniformity

Several centrally managed funds follow a coherent methodology anchored in CPR Annex I, ensuring comparability and consistent application across programmes:

- High alignment: ERDF, CF, RRF, CEF, and InvestEU share a common structure and reference point for intervention types.
- Moderate alignment: EMFAF and LIFE apply similar logic but without full integration into the CPR framework.
- Low alignment: NDICI and IPA III use the Rio marker system and apply it more broadly, limiting compatibility with EU internal tracking systems.

Degree of flexibility and refinement

Horizon Europe and InvestEU stand out for their capacity to revise and refine climate tracking during implementation, incorporating real-time data. ERDF, CF and RRF, on the other hand, apply coefficients based on intervention field logic, relying on the

expected impact rather than broad objectives. Lastly, NDICI and IPA III depend on static estimates from programming documents and annual indicative planning.

5.1.2.2. SQ1.2 Biodiversity: purpose and main elements of the budget tracking method of EU funds (other than the CAP)

The following section focuses on biodiversity budget tracking for the current MFF. It is intended to report on the tracking method and highlight which changes have been implemented compared to the previous period and how this is reflected in the different funds.

Purpose of budget tracking for biodiversity spending of EU funds (other than the CAP)

A key purpose of biodiversity expenditure tracking is still to monitor progress against the formal targets set under the current MFF, which aimed to allocate 7.5% of the budget to biodiversity by 2024 and aims for 10% for 2026 and 2027. More broadly, this tracking helps demonstrate to international partners that the EU is fulfilling its commitments on biodiversity financing, in line with methodologies such as the Rio markers for official development assistance. Additionally, it serves to identify trends in biodiversity-related expenditures over time, allowing the Commission to monitor progress and adjust its approach where necessary. Ultimately, this system of tracking supports the implementation of the EU Biodiversity Strategy for 2030 by providing reliable data on relevant spending[22](Nesbit et al., 2022) The EU Biodiversity Strategy for 2030 pursues various objectives:

- Unlocking at least EUR 20 000 million per year for spending on nature.
- Investing a significant proportion of the EU budget dedicated to climate action on nature-based solutions.
- Establishing a dedicated natural-capital and circular-economy initiative mobilising at least EUR 10 000 million over the next ten years[23].

Main elements of biodiversity budget tracking of EU funds (other than the CAP)

- The tracking methodology for the 2021–2027 programming period continues to rely on EU climate and biodiversity coefficients, which are adapted from the OECD Rio markers. For biodiversity, the Commission has refined its approach by introducing an enhanced tracking methodology that reflects the

[22] (Nesbit et al., 2022)

[23] (EU Commission)

cross-cutting nature of biodiversity and the need to mainstream it across multiple policy areas and economic sectors. This updated system is designed to enable more accurate monitoring of biodiversity-related spending, support evaluation of its effectiveness, and fulfil the EU's reporting obligations under the Convention on Biological Diversity (CBD), better reflecting the degree to which biodiversity considerations have been integrated.

- Improve the accuracy of tracking biodiversity expenditures.

Under this system, coefficients are applied to interventions based on their expected contribution to biodiversity objectives: **significant (100%), moderate (40%), or not relevant (0%)** (EC, 2025 – EU Action on Biodiversity Financing). Details on how these coefficients are applied across different EU funds are provided in the Commission's programme-specific guidance (*Biodiversity tracking methodology for each programme 2021–2027*, EC, 2023)[24] (European Commission, 2023)

Comparison of biodiversity tracking approaches in 2014-2020 and 2021-2027

Biodiversity tracking in the 2014–2020 MFF was largely based on the OECD Rio markers, applied across relevant EU programmes using a binary or graduated scale (0%, 40%, 100%). This approach provided indicative figures but lacked precision and harmonisation across funds. There was no spending target for biodiversity in this period, and methodologies varied by fund and MS.

In contrast, the 2021–2027 MFF introduced a more strategic and systematic methodology, drawing on lessons from climate tracking reforms and political commitments under the EU Biodiversity Strategy. These coefficients are now applied more systematically, particularly in shared management funds such as ERDF and CF, where spending is tracked via intervention fields. For directly managed funds such as Horizon Europe, tagging takes place at the project level. In this period, formal targets of 7.5% (by 2024) and 10% (by 2026/2027) were introduced for biodiversity-related spending. Unlike the original Rio markers, the EU biodiversity coefficients are specifically tailored to the structure of the EU budget. They represent an evolution of the Rio framework, using a different logic that aligns more closely with EU programme needs. It should be noted that while the 7.5% and 10% biodiversity targets guide the allocation process, they are not legally binding commitments but rather form part of broader EU political objectives and are monitored through the performance framework.

The following table summarises the main differences between the two periods. It captures changes not only in methodology, but also in governance, policy framing, and operationalisation.

[24] (European Commission, 2023)

Table 9 - Comparison of EU budget tracking for biodiversity in 2014-2020 and 2021-2027 for funds other than the CAP

Comparison dimension	2014-2020	2021-2027
Overall objective	Support EU biodiversity goals indirectly; no quantified target.	Support EU Biodiversity Strategy; reach 10% spending target by 2026/2027.
Strategic context	No formal strategy link; derived from Rio marker commitments.	Anchored in the EU Biodiversity Strategy and MFF spending targets.
Purpose	Estimate biodiversity-relevant spending for transparency and accountability.	Track progress towards biodiversity finance targets; inform programming and reporting.
Methodology type	Intent-based: Rio markers applied based on stated relevance to biodiversity.	Intent-based: EU biodiversity coefficients adapted from Rio markers; applied based on stated contribution, with limited performance linkage.
Marker system	OECD Rio markers: 100% (principal), 40% (significant), 0% (not targeted).	EU biodiversity coefficients: adapted from Rio markers; 100%/40%/0% used per programme-specific guidance.
Reporting mechanism	Limited reporting; results not systematically captured in the budget performance framework.	Reported in performance statements and MFF monitoring; spending target of 7.5% (2024/25) and 10% (2026/27) defined in the Interinstitutional Agreement, but without binding enforcement or correction mechanisms.
Flexibility and correction	No standard process for review or adjustment.	Still limited, but more structured tagging allows potential refinements.
Tracking level	A mixed approach: project, thematic or programme level tagging, dependent on fund and data availability.	At the project level (direct management) or intervention field level (shared management).
Governance of tracking	Programme-specific methodologies developed by implementing DGs and applied with MS discretion; no central governance.	Central guidance and methodology provided by DG ENV (2023); implementing DGs apply biodiversity coefficients in financial systems; however, governance remains less cohesive, with varied adoption across funds.

Source: Study team

As seen in the table, the current approach reflects a stronger strategic alignment with EU biodiversity goals, more consistent classification methods, and greater transparency in reporting. However, similar to the early years of climate tracking, challenges remain. These include limited correction mechanisms once tagging is applied, and continued variation in implementation across MS and management modes. Overall, the shift represents an important step forward in the EU's efforts to integrate biodiversity into budgetary decision-making.

Comparative analysis of biodiversity tracking methodologies across funds (2021–2027)

The following table outlines how biodiversity tracking is implemented across key EU funds in the current MFF, revealing a range of approaches based on management mode and programme design.

The tracking of biodiversity-related expenditure across EU funds in the 2021–2027 MFF varies by management mode and fund architecture. The table below presents the level of granularity, the implementation logic, and the specific methodology used by each analysed fund outside of the CAP.

Table 10 - Comparison of the biodiversity tracking methodologies for the 2021-2027 period for funds other than CAP

Funds	Level of granularity (based on the application level)	Details on the application level	Biodiversity tracking methodology
Horizon Europe	High	Project level (direct management)	Qualitative tagging based on proposal content and ex-post review; no predefined coefficients. Reflects expected relevance rather than fixed assumptions, thus closer to effect-based logic, but lacks standardised impact benchmarks.
LIFE	High	Project level (direct management)	Biodiversity is integral to project selection; directly tagged
CF	Medium	Intervention field (Policy Objectives)	EU biodiversity coefficients from CPR Annex I
ERDF	Medium	Intervention field (Policy Objectives)	
EMFAF	Medium	Intervention type (shared management)	Annex IV defines biodiversity-relevant interventions; implementation varies
NDICI – Global Europe	Low	Programming level (direct management)	OECD Rio markers applied to action design; qualitative assessment

Source: Study team

While EU biodiversity coefficients offer a more consistent tracking method in shared management funds, direct management programmes such as Horizon Europe still rely on project-level tagging and qualitative assessment. In external action instruments like NDICI, the use of OECD Rio markers persists, limiting comparability with internal funds. EMFAF uses regulatory tagging logic, though practical transparency and consistency vary across MS.

5.1.2.3. SQ1.3 Clean air: purpose and main elements of the budget tracking method of EU funds (other than the CAP)

The EU places a high priority on achieving air quality levels that do not negatively impact human health and the environment. To support this goal, the MFF for 2021-2027 includes mechanisms for tracking expenditure that contributes to clean air objectives across various EU funding programmes. This allows for the monitoring of progress, ensures the effective allocation of resources, and enhances the implementation of clean air policies. The Clean Air Tracking System builds on the experience of the Commission's existing climate and biodiversity tracking mechanisms[25]. It also takes into account proposed programme regulations that identify environmental markers for tracking contributions to environmental objectives.

This chapter outlines the purpose and main elements of the clean air budget tracking method applied to EU funds within the MFF 2021-2027, detailing its application where information is available in the provided sources for specific funds.

The methodology for tracking clean air-related expenditure was developed by the Commission in 2020, and was continued with some slight changes in the 2021–2027 MFF. It was designed to be applied across funds, with retrospective (ex-post) application possible for the 2014–2020 period, where data permitted. As clean air did not receive the same level of attention as climate and biodiversity in the latest MFFs, dedicated tracking mechanisms were not embedded ex-ante in most programmes. As the NEC Directive was adopted during the budget cycle 2014-2020, work on developing a tracking methodology began later, in accordance with the first implementation report. Nevertheless, clean air was already mainstreamed in e.g. Operation Programmes (ERDF/CF) for 2014-2020 or included in e.g. LIFE, as awareness for clean air was growing after launching the Clean Air Package of 2013[26]. Therefore, the current method is discussed in more detail, as it marks the first formal and systematic approach.

Purpose of budget tracking for clean air spending of EU funds other than the CAP

The purpose of clean air budget tracking within the EU framework is to monitor how EU funds are utilised by MS to achieve clean air objectives (EC, 2025). Articles 7 and 11 of the NEC Directive are particularly relevant in this respect. Article 7 deals with financial support of the European Commission, though without a target: “The Commission shall endeavour to facilitate the access of Member States to existing

[25] (European Commission, 2020)

[26] See e.g. ec.europa.eu/commission/presscorner/detail/en/memo_13_1169), the exceedances, and infringements.

Union funds in order to support the achievement of the objectives of this Directive." Article 11 deals with the reporting obligation of the European Commission: "The Commission shall, by 1 April 2020 and every four years thereafter, report to the European Parliament and the Council on the progress made in the implementation of this Directive, including an assessment of its contribution to the achievement of the objectives referred to in Article 1".

This involves assigning EU coefficients to the financial contributions of various EU programmes and actions, reflecting their expected impact on air quality improvement[27]. This tracking allows the Commission to assess how effectively MS are using available EU funding for clean air initiatives[28]. It supports the Commission's obligation under the National Emission Reduction Commitments Directive (NEC Directive) to report on the uptake of Union funds by MS in their efforts to reduce national emissions of certain atmospheric pollutants[29]. Additionally, it provides insights into which funding streams are contributing most to clean air objectives, thereby informing and improving the implementation of clean air policies at both EU and MS levels. The methodology aims to ensure transparency in identifying and accounting for expenditures that benefit clean air across different EU programmes[30]. It also acknowledges that clean air benefits do not only arise from dedicated projects but also from activities in other sectors, such as sustainable transport and energy efficiency, and applies a cross-cutting approach[31].

Unlike climate tracking, clean air tracking does not relate to a specific spending target but is primarily intended to monitor the uptake of EU funding for clean air (thus fulfilling a legal obligation laid down in Articles 6 and 11 to track under the NEC Directive) and to enhance the implementation of clean air policies. The main attributes of clean air tracking include the use of 100%, 40%, and 0% coefficients, attention to administrative effort and simplicity, consistency of coefficient assignment among programmes (ensuring similar activities are marked similarly), transparency of marking, and independence from other tracking methodologies (such as climate and biodiversity tracking), allowing each euro spent to be tracked more than once[32].[33]

[27] (European Commission, 2025)

[28] (European Commission, 2025)

[29] (European Parliament and Council of the European Union, 2016; European Commission, 2020)

[30] (European Commission, 2020)

[31] (European Commission, 2025)

[32] (European Commission, Implementation Report, 2020)

[33] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants; European Commission NEDC Implementation Report 2020, 1 April 2020; European Commission NEDC Implementation Report

Main elements of clean air budget tracking of EU funds (other than the CAP)

For clean air tracking, as with climate tracking, the primary reference point is the commitment appropriation, which allows the Commission and stakeholders to identify planned clean air-related spending early in the budgeting process. However, clean air tracking is not limited to the commitment stage. While the Commission does not verify payments against coefficient-based estimates in a strict monitoring sense, actual spending is monitored and updated over time. For example, the Directorate-General for Regional and Urban Policy (DG REGIO) tracks expenditure by Intervention Field and regularly updates clean air-related spending figures based on financial implementation and amendments to operational programmes. The EU clean air coefficients themselves are inspired by the qualitative Rio markers developed by the OECD Development Assistance Committee (DAC) and were adapted, building on the experience of applying climate Rio markers under the EU budget[34].

Designed to quantify expenditure contributing to clean air objectives, the EU clean air coefficients account for various implementation procedures, including centrally managed, shared management, financial instruments, and programmable/bottom-up approaches. The methodology is adapted to reflect specific circumstances, assigning coefficients at the most appropriate level depending on the design of each budget program, whether at the project, type of intervention, component of the programme, or the entire program[35]. The EU clean air tracking methodology applies a three-tier coefficient system to capture spending relevant to air quality objectives:

- 100% for expenditure expected to principally contribute to clean air objectives (equivalent to OECD Rio marker 2).
- 40% for expenditure expected to significantly contribute to clean air objectives (equivalent to OECD Rio marker 1).
- 0% for expenditure not (or only very modestly) contributing to clean air objectives.

In practice, this methodology adopts a conservative approach, particularly at the 40% level. The assignment is generally restricted to interventions clearly linked to clean air outcomes, such as those targeting reductions in ammonia or particulate emissions,

2024, 31 July 2024; The DG BUDG “Clean-air tracking” page explains how the Commission monitors EU budget spending contributing to clean air, in line with Article 11(1)(c) of the NEC Directive. It covers methodology, estimates for the 2021–2027 EU budget (including NextGenerationEU), and the proportion of multiannual framework funding linked to clean air objectives (around EUR 185.5 billion or 9.7%)

See: https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/clean-air-tracking_en.

[34] (European Commission, Clean-Air Tracking, 2025)

[35] (European Commission, 2020)

and typically supported by relevant result indicators (e.g. R.13 and R.20). Coefficients are not assigned by default but follow a review of the intervention's specific environmental contribution. This cautious logic helps to prevent overestimation and ensures consistency across diverse funding instruments. It is operationalised through tailored tracking procedures that reflect the design and management modes of each programme (e.g. shared, direct, or indirect management).

Method application at the fund level

In the report from the Commission to the European Parliament and the Council on the progress made on the implementation of Directive (EU) 2016/2284, the clean air budget tracking method was initially published in Annex 4[36]. This method was applied ex-post to the relevant EU programmes under the MFF 2014–2020 and was the basis for the 2021–2027 period. The report demonstrates how contributions to clean air objectives can be identified using EU markers, while also explaining why certain activities or interventions were not marked, often due to incomplete or unavailable data or an assessment that the contributions of such activities were (very) limited. This limitation is particularly relevant for bottom-up programmes such as LIFE, where clean air-related spending can only be identified after project selection, not through predefined intervention fields. In these cases, the methodology remains indicative and is dependent on the gradual availability of harmonised project-level data and reporting formats. For Horizon Europe, this is not always the case: the big part in Horizon for clean air comes from Pillar 2, and in Pillar 2, there are calls which are rated with tracking coefficients before they are published.

Tracking in the 2021-2027 MFF

During the 2014–2020 period, clean air expenditure was not subject to a formal EU-wide tracking methodology. While certain programmes, such as LIFE and Horizon 2020, included actions that benefited air quality, these were not tagged in advance under any specific clean air objective. No coefficients, markers, or dedicated reporting systems were in place. Therefore, any estimates for this period rely on retrospective analysis at the project level, or of the detailed nature of the Work Programmes, or qualitative interpretation. Despite its non-binding nature and partial uptake across programmes, the clean air framework in 2021–2027 represents a significant step forward.

To better understand the implementation of clean air tracking under the 2021–2027 MFF, the following table provides an overview of how the methodology has been

[36] Report from the Commission to the Council and the European Parliament on the progress made on the implementation of Directive (EU) 2016/2284 of 1 April 2020. Annex 4 lays out the full methodology used to track EU funds contributing to clean air objectives**,** including quantified estimates of relevant financial streams

applied across selected EU funds outside the CAP. It highlights the level of granularity, the presence and type of tagging procedures, and the extent to which clean air objectives are systematically captured in the programme design and reporting.

Table 11 - Comparison of the clean air tracking methodologies for the 2021-2027 period for funds other than CAP

Funds	Level of granularity (based on the application level)	Detail on the application level	Clean air tracking methodology
Horizon Europe	High	Project level	Ex-ante tagging based on the calls for proposals' relevance to air quality
LIFE	High	Project level	Tagging integrated in the design for projects with clean air objectives
CEF	Medium	Type of action / Project level	No dedicated clean air tagging; relevance inferred from environmental impacts in project design
InvestEU	Medium	Component / Project-level investment under thematic window	No dedicated clean air tagging; limited relevance unless indirectly through green investments
CF	Medium	Intervention field	Inferred contribution from environmental fields; no dedicated tagging
ERDF	Medium	Intervention field	
EMFAF	Low/Not specified	Not specified	No dedicated tagging, very few actions, and small if any, with relevance for clean air

Source: Study team

As shown, implementation varies by fund. LIFE demonstrates a structured approach to tagging, while Horizon Europe applies the methodology to the Work Programmes (e.g. Missions, Partnerships) and especially to the Calls for proposals in the Work Programmes for the Clusters in Pillar 2, where most of the funding takes place. In cohesion instruments, clean air tracking is based on a systematic application of tracking coefficients per intervention field, and benefits are systematically captured. While formal clean air tagging is not yet established in several funds, this does not imply that no relevant activities may exist, but in those funding programmes, they are expected to be minimal or non-existent. As soon as there are indications that meaningful funding is made available for clean air, a funding programme is included in the tracking methodology.

5.2. SQ2: What are the purpose, main elements and differences of the methodologies used to track the contribution of the CAP?

SQ2: What are the purpose, main elements (including application of Rio and EU Markers) and differences of the methodologies used for period 2014-2020 (including prolongation to 2022) and for period 2023-2027 to track the contribution of the CAP to climate (Sub-question2.3.1)? Biodiversity (Sub-question 2.3.2)? clean air (Sub-question 2.3.4)?

Key findings:

- The 2023–2027 CAP introduced a harmonised tracking methodology based on EU-specific coefficients (0%, 40%, 100%), replacing the Rio marker approach previously used for indicative monitoring of climate- and biodiversity-relevant expenditure.
- Climate tracking under the CAP is now aligned across both pillars and closely mirrors the CPR methodology. It is more based on expected contribution (ex-ante) and applied at the intervention level by MS in their CSPs.
- Compared to the 2014-2020 period, where climate relevance was often assumed at the measure level, the new system offers greater granularity and programme-specific application.
- (2023-2027) Climate and biodiversity tracking are carried out separately but follow a coherent logic under the CSPs, applying the same coefficient system across both pillars with reporting responsibilities primarily at MS level.
- (2023-2027) For biodiversity tracking, several MS apply intermediate coefficients (e.g. 70%, 50%) based on linkage to SO6, enabling a more precise estimate of biodiversity-related expenditure.
- (2023-2027) Most DPs are considered neutral (0%) in the tracking process for biodiversity and clean air, though subject to conditionality; these baseline environmental requirements support objectives indirectly but are deemed to have little relevance and therefore allocated 0%.
- (2023-2027) Clean air tracking under the CAP is a recent addition. It uses the standard coefficients and Result Indicators (notably R.13 and R.20) as well as qualitative assessments of interventions expected to reduce ammonia or other air pollutant emissions.
- For the 2014–2020 period, no formal mechanism with clear intervention fields and related tracking coefficients for tracking clean air spending existed under the CAP, as the Directive which provided the legal basis was only adopted in 2016. Available estimates are based on retrospective analyses and indicative extrapolations.

5.2.1. Methodological approach

To answer SQ 2 and its three sub-questions, a structured review of the EU's methodology for tracking climate, biodiversity, and clean air expenditure under the CAP was conducted, covering both the 2014–2020 (including transitional years 2021–2022) and the 2023–2027 period. The analysis focused on:

- the evolution of tracking methodologies from Rio marker–based reporting to EU-specific coefficient systems;
- the differences in application between Pillar I (e.g. DPs) and Pillar II (e.g. agri-environment-climate measures (AECMs), Natura 2000 payments);
- the scope and coverage of tracking across various CAP interventions;
- the use of Result Indicators (e.g. R.13, R.20) and their linkage to environmental objectives;
- the governance structure, including the roles of MS and the Commission in assigning and reporting tracking values.

The methodology relied primarily on official Commission documents and guidance for the various tracking methodologies. Supplementary sources included independent evaluations, academic literature, and MS CSPs as well as their summaries. Where possible, findings were triangulated to improve reliability.

The analysis also considered different known limitations, e.g.:

- in 2014–2020, biodiversity and climate tracking used adapted Rio markers, but clean air had no ex-ante tracking mechanism due to the clean air tracking provisions originating from the NEC Directive adopted in 2016;
- clean air tracking under the CAP is mandatory under the EU acquis, but there is no budget target and considering the CAP structure, it has to rely on indirect proxies (e.g. selected result indicators, GAECs), which limits precision;

Separate clean air objectives are absent in the CAP. Unlike ERDF/CF, this seems to prevent its interventions from contributing considerably to clean air, to make systematic prioritisation of air quality feasible, and to have clean air tracking coefficients and automatic follow-up on money spent. These methodological features and constraints were taken into account in the comparative assessment across objectives and time periods.

5.2.2. Answer to the study question

5.2.2.1. SQ2.1 Climate: purpose and main elements of the budget tracking method of the CAP

On June 1 2018, the Commission introduced legislative proposals for the 2021-2027 CAP, aiming to enhance environmental and climate protection. The CAP adopts a performance-based model, granting MS more responsibility and accountability in designing CAP interventions, outlined in their CSPs for Commission approval. In December 2019, the Commission unveiled the European Green Deal, aiming to make Europe the first climate-neutral continent by 2050. For the 2021-2027 period, the Commission proposed allocating 25% of the EU budget to climate action, which the Council later increased to 30%. Various strategies and legislative proposals were issued in 2020 to achieve at least a 55% reduction in emissions by 2030 compared to 1990 levels and climate neutrality by 2050.

In December 2020, the Commission provided recommendations to MS for preparing their CSPs. These recommendations included using eco-schemes for rewetting drained peatland, promoting precision farming, and practising conservation agriculture. The European Court of Auditors' (ECA) special report on EU greenhouse gas emissions emphasised the need for strategic plans in agriculture and land use to contribute to the 2050 reduction targets, and for MS to establish appropriate policies and measures[37].

The CAP aims to allocate 40% of its overall expenditures to climate action. To ensure that this target is met, annual review meetings and biennial performance reviews between the Commission and MS are held[38]. As in the previous MFF, the EU uses climate coefficients, based on OECD Rio markers, to assess climate-relevant budget spending. These coefficients assign values to budgetary items based on their relevance to climate actions, facilitating transparent and accountable climate spending reporting.

Purpose of budget tracking for climate spending of the CAP

To address the challenges of CC, the EU has committed itself to international agreements. After ratifying these agreements, the EU has established quantified targets to reduce greenhouse gas emissions. In 2011, the Commission outlined its aim to allocate a minimum of 20% of the 2014-2020 EU budget towards climate action. This commitment was operationalised through climate mainstreaming, which

[37] (European Court of Auditors, 2019)

[38] (European Parliament and Council of the European Union, 2021)

requires climate considerations to be integrated across all major EU spending programmes, including the CAP.

The purpose of tracking climate-related expenditure in the EU budget goes beyond the accounting of spending. The aim is to promote the integration of climate objectives into the EU's various policy areas and programmes[39]. Tracking is intended to ensure that EU budget funds contribute to the achievement of the Union's climate and environmental goals. This also involves steering expenditure towards the achievement of both sector-specific and overarching targets. Tracking also serves the purpose of accountability to the budgetary and discharge authorities, as well as other interested parties[40].

In the CAP, the application of climate coefficients aimed to identify and quantify the portion of expenditure contributing to climate objectives. These coefficients were applied ex ante to specific types of interventions and were not adjusted ex post, meaning they did not reflect whether the climate benefits were delivered.[41] In practice, the methodology was largely indicative and based on intervention logic rather than observed outcomes, which has led to criticisms regarding the reliability of the resulting climate tracking figures[42].

Main elements of climate budget tracking of the CAP

Article 100 of Regulation (EU) 2021/2115 has established how climate expenditure should be tracked. In article 100 (2), it is written that the EU climate coefficients are assigned to interventions based on their degree of contribution to climate change adaptation or mitigation:

- 100%: the activity is expected to make a substantial contribution to climate change mitigation or adaptation objectives in line with EU climate goals.
- 40%: the activity is expected to make a non-marginal, positive contribution to climate change mitigation or adaptation objectives.
- 0%: the activity is expected to have a neutral impact on climate objectives.

For the 2021-2027 MFF, the Commission decided to shift the climate tracking methodology from an intent-based to an effect-based approach. The latter assigns climate-relevant contributions to each intervention based on its potential and the

[39] (Nesbit et al., 2020)

[40] (Nesbit et al., 2020)

[41] (Levarlet et al., 2022)

[42] (European Court of Auditors, 2021)

degree to which it is expected to contribute to addressing CC. This methodology applies to the 2023-2027 CAP.

Climate budget tracking method in EAGF in MFF 2023-2027

In the 2023-2027 programming period, DPs (European Agricultural Guarantee Fund (EAGF)) and rural development funds (European Agricultural Fund for Rural Development (EAFRD)) are expected to play a role in achieving the climate spending objective of 40%. Environmental and climate objectives are enshrined in a cross-cutting way in the CAP. They start with the enhanced conditionality (especially GAEC), followed by eco-schemes (under DPs), and then by all rural development (EAFRD) interventions linked to CAP's SO4, SO5 or SO6.

This so-called "green architecture" is formed by eco-schemes, environment-climate commitments (ENVCLIM), and compensation for area-specific disadvantages, such as those related to Natura 2000 or the Water Framework Directive (WFD). These voluntary, area-based measures directly interact with conditionality by exceeding its mandatory requirements. Other rural development interventions, such as investment support, advisory services, cooperation, knowledge exchange or even LEADER, contribute to the green architecture, if linked to SO4, SO5 or SO6.

CAP DPs climate coefficients

To address climate and environmental objectives, the target of **25% of DPs** through eco-schemes has been set.

DPs are governed by Articles 20 to 41 of Regulation (EU) 2021/2115 (CSP Regulation). Article 100 of the same regulation describes how climate expenditure should be tracked to the CAP. Article 100 (1) states that based on the information provided by MS, the Commission shall evaluate the contribution of the policy to achieving the CC objectives using a simple and common methodology.

Further, article 100 (2) states that the contribution to achieving the expenditure target shall be estimated through the application of specific weightings, differentiated based on whether the support makes a significant or a moderate contribution towards achieving CC objectives. The weightings should apply as follows:

- 40 % for the expenditure under the basic income support for sustainability (BISS) and the complementary income support referred to in Title III, Chapter II, Section 2, Subsections 2 and 3; Under this category falls:
    - BISS (Articles 21-28 of Regulation (EU) 2021/2115) is an annual payment per hectare to which half of the DP budget is devoted.

  - Complementary redistributive income support for sustainability (CRISS) (Article 29 of Regulation (EU) 2021/2115) is an annual extra payment for the first hectares of farmland for farmers who are entitled to BISS.
  - Complementary income support for young farmers (CIS-YF) (Article 30 of Regulation (EU) 2021/2115) is an annual extra payment for new farmers who are entitled to BISS.
- 100 % for expenditure under the eco-schemes referred to in Title III, Chapter II, Section 2, Subsection 4, Schemes for the climate, the environment and animal welfare.
  - Schemes for the climate, the environment and animal welfare (eco-schemes) (Article 31 of Regulation (EU) 2021/2115) help farmers who commit to agricultural practices that are beneficial to the climate, the environment and animal welfare or in combating antimicrobial resistance.
- 0% for coupled income support (CIS) and inventions in specific sectors
  - CIS (Articles 32-35 of Regulation (EU) 2021/2115);
  - Crop-specific payment for cotton (Articles 36-41 of Regulation (EU) 2021/2115).

Rural development (EAFRD) climate coefficients

A specific target of 35% of expenditure from the EAFRD is designated for climate and environmental interventions in the CSP regulation (Regulation (EU) 2021/2115). Article 100 of Regulation (EU) 2021/2115 describes how the climate weighting should be applied:

- 100 % for expenditure for the interventions referred to in Article 93(1), other than expenditure for natural or other area-specific constraints referred to in Article 71.
- 40 % for expenditure for natural or other area-specific constraints referred to in Article 71 (also named natural and other area-specific constraints).

Named interventions which fall under the 100% weighting are:

- For management commitments referred to in article 70 (‘environmental, climate-related and other management commitments’).
- For area-specific disadvantages referred to in article 72.
- For investments under articles 73 and 74 linked to SOs set out in article 6(1) (d), (e) and (f) and for animal welfare in article 6(1)(i).

These interventions are summarised under the term rural development interventions, addressing specific environmental and climate-related objectives. The following table provides an overview of the climate coefficients in EAGF and EAFRD (2021-2027).

Table 12 - Climate coefficients in EAGF and EAFRD for 2021-2027

Climate coefficient	EAGF	EAFRD
0%	Coupled DPs interventions in certain sectors.	Other expenditure not related to environmental and climate objectives
40%	Basic and complementary income support.	ANC
100%	Eco-schemes	Rural development (RD) interventions addressing specific environmental and climate-related objectives (excluding ANC).

Source: Study team

DNSH principle in the CAP

It is important to note that the CAP regulation does not explicitly reference the DNSH principle. However, Preamble 90 states that the EAFRD should not support investments that harm the environment. Specific exclusion rules in the regulations prevent support for investments in irrigation facilities that do not improve water quality or interventions that do not comply with sustainable forest management. Additionally, GAEC, as part of conditionality in Articles 12 and 13, help exclude most harmful interventions. Despite this, the reference to the DNSH principle remains vague and lacks clear operational implementing rules[43].

Comparison of climate tracking approaches in 2014-2020 and 2021-2027

To assess the evolution of the EU's climate expenditure tracking, the following table compares the methodologies applied during the 2014–2020 and 2021–2027 programming periods under the CAP, highlighting the methodological shifts while also noting areas of continuity. It focuses on key structural and methodological elements, such as overall policy objectives, classification and reporting systems, and governance mechanisms.

In the 2014–2020 period, climate tracking was largely intent-based and relied on the OECD Rio markers, assigning fixed coefficients to predefined measures. This approach often lacked granularity and was not systematically linked to performance outcomes. By contrast, the 2021–2027 CAP introduced a more detailed and more

[43] (Levarlet et al., 2022)

effect-based system grounded in EU-specific climate coefficients applied at the intervention level. This shift allowed for more precise tracking of expected climate contributions, supported by enhanced reporting mechanisms and a greater degree of central coordination.

Table 13 - Comparison of tracking objectives and implementation for the CAP for 2014-2020 and 2021-2027

Climate	MFF 2014-2020 (extended to 2022)	MFF 2021-2027 (applied from 2023)
Purpose	To tackle CC, the EU has committed to international agreements and set quantified targets. These are implemented through climate mainstreaming, which integrates climate action into EU policies and funding. Climate expenditure is tracked by monitoring financial commitments and assessing alignment with EU climate objectives.	
	International commitments: The EU is committed to reducing fossil fuel emissions through international climate commitments. The Kyoto protocol, which entered into force in 2005, committed the EU to reducing greenhouse gases by 8% compared to 1990. **EU Climate Framework:** * Climate mainstream methodology: Incorporating climate-related considerations in all policies, instruments, programmes and funds. *Targets: **20% of the EU budget dedicated to climate.**	**International commitments:** In addition to its former commitment, the EU signed the Paris Agreement, which established a worldwide climate mitigation target of limiting global warming to below 2°C and preferably to 1,5°C. UE committed itself to cutting its emissions compared with 1990 levels by 40% by 2030. **EU Climate Framework:** Climate mainstream methodology: Incorporating climate-related considerations in all policies, instruments, programmes and funds. Targets: **30% of the EU budget on climate action /** 40% of the CAP needs to be climate-relevant.
Methodology	**EU Climate Coefficients based on the OECD Rio markers.** *0%: no or insignificant contribution /40%: moderate contribution / 100%: significant contribution.	
Main elements of methodology	DPs (EAGF) ***Greening (30% of total DP budget)** - **Crop diversification = 0%** contribution to climate (Applied 0% coefficient to 33% of crop diversification) - **Ecological focus areas =4%** contribution to climate (Applied 40% Coefficient to 33% of ecological focus areas) - **Permanent pastures =10%** contribution to climate (Applied 100% Coefficient to 33% of permanent pastures) ***DP outside greening (70% of total budget):** => **5,6% contribution to climate** (Applied 40% of the climate coefficient to 20% of the DPs outside greening, which are considered climate relevant) Rural development (EAFRD): ***Measures under P4 and P5: 100% including ANC** ***Measures under P3B and P6: 40%**	DPs (EAGF) ***Basic and complementary income support linked to conditionality:**- BISS, CRISS, CIS-YF **=> 40%** (Enhanced Conditionality: Additional climate and environment requirements for farmers to receive income support (GAEC), therefore 40% Climate Coefficient are applied to Basic and complementary income support) ***Eco-scheme: 100%** (Introduction of schemes to encourage farmers to adopt additional sustainable agricultural practices) Rural development (EAFRD): ***ANC: 40%** ***All interventions linked to SO4,5, 6: 100%**
Intent / effect based	**Intent-based tracking**	**More Effect-based approach**

Source: Study team

5.2.2.2. SQ2.2 Biodiversity: purpose and main elements of the budget tracking method of the CAP

The decline in farmland biodiversity is a significant concern, and the EU has established biodiversity strategies and targets to address this issue[44]. In addition to its role in supporting food security and farm incomes, the CAP plays a role in safeguarding and promoting a range of environmental goals, including biodiversity on farmland.

Both MFF periods of 2014-2020 and 2021-2027 have set targets for the biodiversity objectives' expenditure:

- **During the 2014-2020 period**, the Commission and Member states aimed to allocate 8.1% of the EU budget (EUR 86 billion) to biodiversity, with 77% of this funding (EUR 66 billion) sourced from the CAP[45].
- **During the 2021-2027 period**, the overall goal is to allocate 7.5% of annual spending under the MFF to biodiversity objectives by 2024 and increase this to 10% by 2026 and 2027.

To understand the impact of this expenditure and to monitor progress towards biodiversity objectives, a system for tracking biodiversity-related spending within the CAP has been developed and implemented[46].

This chapter explores the purpose behind tracking, the main elements of the methodology used, and the specific approaches applied to the two pillars of the CAP during the MFF period of 2014-2020, as well as the subsequent transition period from 2021-2022 and the MFF period of 2021-2027.

Purpose of biodiversity budget tracking of the CAP

The primary purpose of tracking biodiversity expenditure in the EU budget, particularly within the CAP, is to evaluate the EU's financial contribution towards achieving its biodiversity targets[47].

[44] (European Court of Auditors, 2020)

[45] (European Court of Auditors, 2020)

[46] (Nesbit et al., 2020)

[47] (Nesbit et al., 2020; European Court of Auditors, 2020)

This is crucial for several reasons:

- Tracking enables the Commission and MS to monitor the proportion of the allocated budget directed towards activities intended to positively impact biodiversity[48]. This information is crucial for evaluating the CAP's contribution to the EU Biodiversity Strategy goals[49];
- Documenting biodiversity-related expenditure allows the EU to demonstrate its commitment to addressing biodiversity loss and ensures accountability for meeting its stated ambitions[50].
- The data gathered through biodiversity tracking can inform evaluations of existing policies and identify areas where the design and implementation of CAP instruments could be improved to better support biodiversity. Recommendations based on these evaluations have contributed to the preparation of future agricultural policies in 2023-2027.
- Additionally, the EU has reporting obligations under international agreements such as the United Nations (UN) CBD, which include reporting on biodiversity-related expenditure[51]. A robust tracking system facilitates the fulfilment of these obligations.
- Finally, understanding past and current levels of biodiversity funding can inform future budget allocations and help ensure that sufficient financial resources are directed towards addressing biodiversity needs, as highlighted in the Biodiversity Strategy for 2030[52].

Methodology of biodiversity budget tracking of the CAP

The EU's approach to tracking biodiversity expenditure during both MFF periods relies on a system of markers, largely based on the OECD Rio markers[53].

[48] (Nesbit et al., 2020)

[49] (European Court of Auditors, 2020)

[50] (Nesbit et al., 2020)

[51] (European Court of Auditors, 2020)

[52] (European Parliament, 2023)

[53] (Nesbit et al., 2020)

These markers assess the extent to which a project or intervention aims to target biodiversity objectives:

- 100 % marker (Principal objective): Applied when biodiversity protection is explicitly stated as the fundamental goal in the design or rationale of the activity.
- 40 % marker (Significant objective): Used for activities that do not have biodiversity as their primary goal but still make a significant contribution to biodiversity objectives.
- 0 % marker (No significant contribution): Assigned to activities with negligible or no identifiable positive impact on biodiversity.

These markers are applied to different levels of interventions depending on the specific fund or policy area.

MFF 2014-2020

For the CAP, markers were generally applied to pillar 1 measures (under EAGF) and to priorities and Focus Areas within rural development programmes (under EAFRD)[54]. The total biodiversity-related expenditure is then calculated by multiplying the relevant budget allocation by the assigned marker coefficient.

It is important to note that this methodology focuses on the *intended* contribution to biodiversity, rather than directly measuring the *actual* biodiversity outcomes (Nesbit et al., 2020). Furthermore, concerns have been raised about the accuracy and potential for overestimation of biodiversity funding allocation, due to the application of these markers[55].

MFF 2021-2027

The biodiversity budget tracking methodology has been further developed, taking into account the new CAP architecture and its increased green ambition implemented through national CSPs[56]. The Commission states on its biodiversity mainstreaming website that “the common agricultural policy methodology for the 2023-2027 period has a higher level of granularity and ambition compared to the methodology used in 2014-2022, allowing for more precise and conservative estimates compared to the past.”

[54] (Nesbit et al., 2020)

[55] (Nesbit et al., 2020; Nesbit et al., 2022)

[56] (European Commission, 2025)

Main elements of biodiversity budget tracking of the CAP

MFF 2014-2020

The methodology applied for tracking biodiversity expenditure during 2014-2020 changed in 2016 when the CAP reform took effect.

The financial years 2014 and 2015 operated under the rules of the previous CAP. For this period, a 40% coefficient was applied to a 20% share of DPs to take account of the biodiversity-related elements of cross-compliance. This meant that 8% of the DPs budget counted as biodiversity expenditure. A 40% coefficient was applied to all EAFRD expenditure.

From 2016 to 2020, a revised approach was taken to account for the introduction of the “green DP” within EAGF and the changes made to cross-compliance.

These changes led to the following calculation:

DPs (EAGF)

The tracking of biodiversity-relevant expenditure focused primarily on DPs, specifically the greening component and the biodiversity contributions of cross-compliance. Greening measures, which included agricultural practices beneficial for the climate and environment, made up 30% of the total DPs budget. The Commission assigned a 40% marker to these payments, indicating that 12 % (40% of 30%) of the EAGF DPs budget was considered to contribute to biodiversity. These practices encompassed crop diversification, maintenance of existing permanent grassland, and preservation of Ecological Focus Areas (EFA) on arable land[57].

Regarding cross-compliance, the tracking methodology assumed that 10% of the remaining DPs (excluding greening payments and payments under the Small Farmers Scheme, which were not subject to cross-compliance) merited a 40% marker to reflect the biodiversity contribution of cross-compliance. This resulted in 4% of the budget (DPs) contributing to biodiversity through cross-compliance[58].

Taken together, this approach resulted in 14.8 % of the EAGF DPs’ budget being recorded as contributing to biodiversity[59].

Rural development (EAFRD)

[57] (Nesbit et al., 2020; Nesbit et al., 2022)

[58] (European Commission, 2025)

[59] (Nesbit et al., 2020)

During the 2014-2020 period, the EAFRD adopted a different approach from the EAGF, focusing on priorities and Focus Areas defined in rural development regulations (Nesbit et al., 2022):

- Priority 4 aimed at restoring, preserving, and enhancing ecosystems dependent on agriculture and forestry, with all Focus Areas under this priority assigned a 100% marker, except for the ANC measure, which received a 0% marker[60]. Measures under this priority included AECCs, support for organic farming, and investments in biodiversity protection, with AECCs typically constituting the largest share of biodiversity expenditure under EAFRD[61];
- Focus Area 5E, which aimed at fostering carbon conservation and sequestration in agriculture and forestry, was assigned a 40 % marker[62]. This included measures related to soil and forest management with potential climate and biodiversity co-benefits. The Rio markers were applied to all measures programmed under these priority areas without further differentiation based on the specific type of measure or the characteristics of the farmland[63].

The proportion of EAFRD expenditure tracked as biodiversity-relevant varied between MS and years, depending on the allocation of funds to these specific priorities and Focus Areas and their implementation rates[64]. For the overall 2014-2020 period, approximately 33% of total EAFRD expenditure was tracked as relevant for biodiversity[65].

MFF 2021-2027

DPs (EAGF)

The biodiversity budget tracking method in the EAGF in the period 2023-2027 considers the new CAP architecture and its increased green ambition[66]. This method

[60] (Nesbit et al., 2020; Nesbit et al., 2022)

[61] (Nesbit et al., 2020)

[62] (Nesbit et al., 2020)

[63] (Nesbit et al., 2020)

[64] (Nesbit et al., 2020; Nesbit et al., 2022)

[65] (Nesbit et al., 2022)

[66] (European Commission, 2025)

applies 40% EU coefficients to DPs other than eco-schemes and payments for natural or other ANC, with a weighting factor of 10%[67].

DPs, excluding eco-schemes, and payments for natural or other ANC are deemed to support biodiversity objectives due to their conditionality requirements. Additionally, ANC payments help prevent land abandonment, thereby indirectly aiding in the preservation of farmland biodiversity[68].

Rural development (EAFRD)

The biodiversity budget tracking method in the EAFRD under the MFF 2021-2027 also uses the same EU coefficients and weighting factors on eco-schemes and other rural development measures that are linked to the environmental and climate-SOs[69].

The methodology is structured around the connections between each intervention and the three environmental and climate-SOs outlined in Article 6(1) of the CSP Regulation (EU) 2021/2115. These objectives include contributing to CCA and CCM (SO4), fostering sustainable development and efficient management of natural resources (SO5), and halting and reversing biodiversity loss (SO6). MS were required to establish these links for each intervention in their CSP. Based on these links, various spending categories are identified.

The methodology distinguishes between interventions flagged by MS for their biodiversity objective (SO6) and those linked to other objectives (SO4 and SO5). For interventions linked solely to SO6, a 100 % coefficient is applied, while those linked to multiple objectives receive adjusted coefficients to reflect their partial contribution to biodiversity.

For eco-schemes and rural development interventions (excluding payments for natural or other area-specific constraints), the weighting factor is determined by the number of CAP SOs associated with each intervention[70]. This approach ensures that the financial allocations are accurately tracked and contribute effectively to biodiversity goals. The following table presents the main inputs regarding the purpose, the budget tracking methodology, the main elements and the differences observed in each MFF period.

[67] (European Commission, 2023)

[68] (European Commission, 2025)

[69] (European Commission, 2025)

[70] (European Commission, 2025)

Table 14 - Biodiversity: purpose, methodology, main elements and differences between the MFF periods

	MFF 2014-2020	Transition Period 2021-2022	MFF 2021-2027
Purpose	"The Union and its MS are parties to the Convention on Biological Diversity. As such, they are is committed to the long-term strategic vision, adopted at the tenth meeting of the Conference of the Parties to that Convention on 18-29 October 2010 by Decision X/2 Strategic Plan for Biodiversity 2011-2020, that, by 2050, biodiversity is to be valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people" (European Parliament and Council of the European Union, 2024). Following this agreement, the Commission adopted in 2011 the Biodiversity Strategy aimed at halting biodiversity loss and ecosystem degradation by 2020, with the goal of restoring them where possible. In 2020, the EU Commission launched the EU Biodiversity Strategy for 2030. As part of this plan, the Commission proposed the Nature Restoration Regulation to enable the recovery of biodiversity.		
Objective	Allocate 8,1 % of EU budget to biodiversity with 77 % of this funding (EUR 66 billion) from CAP.	Allocate 7,5 % of annual spending to biodiversity by 2024; increasing to 10 % in 2026 and 2027.	
Tracking methodology	OECD Rio markers to assess biodiversity objectives: - 100% marker (principal objective): biodiversity protection is the fundamental goal of the activity. - 40% marker (significant objective): biodiversity is not the primary goal, but makes a significant contribution to the activity. - 0% marker (no significant contribution): Negligible or no positive impact on biodiversity. Markers applied to pillar 1's measures (EAGF) and to priorities/Focus Areas (EAFRD). Total biodiversity-related expenditure = relevant budget allocation*assigned marker coefficient.	The biodiversity tracking methodology for EAGF and EAFRD continued to apply.	In addition to OECD Rio markers (0% / 40% / 100%), application of weighting factors (50% / 70% / 100%) is used to better reflect the varied impacts of different types of interventions on biodiversity.

	MFF 2014-2020		Transition Period 2021-2022	MFF 2021-2027
Main elements	**2014-2015** EAGF: 40 % of coefficient to 20 % of DPs. EAFRD: 40 % of coefficient for all EAFRD expenditure.	**2016-2020** EAGF: - Greening Measures: 30 % of DP budget * 40 % of coefficient = 12 % contribute to biodiversity. - Cross Compliance: 10 % of remaining DP (excl. Greening payments and PFS)*40 % of coefficient = 4 % contribute to biodiversity. **- Overall contribution = 14,8 % of EAGF DPs contribute to biodiversity.** EAFRD: - P4 (ecosystems): 100 % coefficient, except for the amounts for ANCs. - Focus Area 5E (carbon conservation and sequestration): 40 % coefficient. **- Overall contribution = 33 % of total EAFRD expenditure contribute to biodiversity.**	Same as MFF 2014-2020.	EAGF: - DPs other than eco-schemes and ANC: 40 % of coefficient + 10 % weighting factor (reduced in particular years when some GAECs were not applicable). EAFRD (other than ANC) and eco-schemes: - Interventions which flagged the biodiversity objective (SO6): 100 % of coefficient with weighting factors as such: - 100 % weight for interventions linked to SO6 only - 70 % weight for interventions linked to both SO6 and SO4/SO5 - 50 % to interventions linked to SO6 and other SO6 than SO4 and SO5 - Interventions which did not flag the biodiversity objective (SO6): 40 % of coefficient with weighting factors as such: - 100 % weight for interventions linked to SO4 or SO5 only - 50 % weight for interventions linked to SO4/SO5 and other SOs
Differences in the methodologies	Intent-based approach		Intent-based approach	More effect-based approach Application of weighting factors. Higher level of granularity and ambition, more precise and conservative estimates.

Sources: study team based on Biodiversity Financing and Tracking Final Report and Common Agricultural Policy – Performance (European Commission)[71]

[71] (European Commission: Directorate-General for Environment et al., 2022; European Commission, 2025)

5.2.2.3. SQ2.3 Clean air: purpose and main elements of the budget tracking method of the CAP

This chapter outlines the purpose and main elements of the clean air budget tracking method within the CAP, covering both the transitional period of the extended 2014–2020 CAP (until the end of 2022) and the current CAP 2023–2027, with specific attention to the EAGF and the EAFRD. For the reasons mentioned before, clean air budget tracking is not analysed separately for both periods.

Purpose of budget tracking for clean air spending of the CAP

The primary purpose of clean air expenditure tracking is to monitor the uptake of EU funding programmes for reducing emissions of air pollutants. Article 11(e) of the NEC Directive says: 'The Commission shall report to the European Parliament and to the Council on the progress made in the implementation of this Directive. That report shall include, in particular, uptake and use of Union funding mechanisms supporting implementation of measures related to the Directive. This helps the Commission to evaluate the contribution of different funding streams to improving air quality and to track the progress of clean air policies[72]. It supports the Commission's obligation under Article 11 of the NEC Directive to report on the use of EU funds for achieving national emission reduction commitments, thereby enhancing transparency and policy implementation[73].

Main elements of budget tracking for clean air spending of the CAP

The CAP uses the same principles of the EU clean air tracking and the EU clean air coefficients as described in the chapter 5.1.2.3 of this report. Clean air tracking was initially introduced in 2020 in the Report from the Commission to the European Parliament and the Council on the progress made on the implementation of Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants, in which the application of relevant EU funds is described. Therefore, the same clean air method is applied to the EU funds at the smallest fund activity level.

Given the fact that the NEC Directive was adopted only in 2016, for the 2014–2022 period, clean air tracking under the CAP was applied retrospectively using an ex-post methodology, as outlined in Annex 4 (part 2e) of the 2020 NEC Directive implementation report. The absence of clean air tracking at the start of the 2014-2020 budget cycle did not affect spending on clean air, e.g. Operational Programs (ERDF/CF). Member States were generally well aware of exceedances of EU limit values and related infringements, and in 2013, the Clean Air Package was launched, raising awareness of the problem of air pollution even more. Tracking was based on

[72] (European Commission, 2025)

[73] (European Parliament and Council of the European Union, 2016; European Commission, 2025)

the estimated impact of interventions on ammonia (NH_3) emissions, as well as energy efficiency measures.

In the current CAP (2023–2027), which entered into force in 2023, clean air tracking is applied ex-ante using a more structured approach. Although the CAP does not define an SO for air quality, the clean air tracking methodology is implemented through two Result Indicators (RI): R.13 (reducing emissions in the livestock sector) and R.20 (improving air quality). This shift reflects a move toward a more formalised and forward-looking tracking framework, as presented in the Commission's clean air methodology guidance[74].

Clean air budget tracking method in EAGF in MFF 2023-2027

The EAGF does not contribute to the clean air objective under the 2023–2027 MFF. The Report from the Commission to the European Parliament and the Council on the progress made on the implementation of Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants considered that one of the elements of cross-compliance, specifically GAEC number 6, which prohibits the burning of stubble in the field to maintain organic matter in the soil, contributed to the reduction of PM_{10} emissions[75].

However, the report highlighted the difficulty in quantifying this contribution and the expected low value of this element in the overall value of DPs, leading to the decision to fix the contribution at 0%[76].

Clean air budget tracking method in EAFRD in MFF 2023-2027

Starting in 2024, the methodology for tracking the contribution of the EAFRD to clean air objectives is partially aligned with the approach used for biodiversity tracking [77]. This involves linking the relevant CSP interventions to the indicators for air quality mentioned in Regulation (EU) 2021/2115; several interventions contribute indirectly to clean air goals.

[74] (European Commission, 2024)

[75] PM_{10} emissions refer to particulate matter with a diameter of 10 micrometres or less, which can be inhaled and pose risks to human health and the environment.

[76] (European Commission, 2020)

[77] (European Commission, 2025)

Relevant interventions include:

- Investments in improved manure storage (supported in 21 CSPs) to reduce emissions from livestock farming;
- Enhanced fertilisation techniques, including precision farming, to lower ammonia and nitrogen oxide emissions from arable farming[78].

Although there is no SO for air quality, the clean air tracking methodology is initially based on RIs, particularly R.13 and R.20[79]. These indicators are defined by the Regulation on CSP (Regulation (EU) 2021/2115). However, applying R13 and R20 to the plans was difficult, as it was generally not clear how much of the spending on certain actions could be allocated to the various specific indicators linked to those actions.

The total clean air-relevant contribution of the CAP in the MFF 2021-2027 is estimated at EUR 1.78 billion EUR[80]. It is important to note that, compared to the 2014–2020 CAP and the 2021–2027 ERDF and CF, the current CAP clean air tracking methodology no longer includes energy efficiency measures. This exclusion may reduce the consistency of clean air tracking across EU funding instruments, as energy efficiency remains a significant component in other funds' contributions to air quality improvements[81]. However, the outlays for energy efficiency are very small compared to the total amount of EU funding made available for clean air. So, there is no significant tracking error regarding the CAP in absolute numbers.

[78] (European Commission, 2025)

[79] (European Commission, 2024)

[80] (European Commission, 2025)

[81] (European Commission, 2025)

5.3. SQ3: What are the main differences and similarities of tracking methodologies used for CAP with the methodologies used for other EU funds?

SQ3: **Based on the answers to SQ1 and SQ2, what are the main differences and similarities of tracking methodologies used for CAP with the methodologies used for other EU funds: 3.1 concerning climate budget tracking? 3.2 concerning biodiversity budget tracking? 3.3 concerning clean air budget tracking?**

Key findings:

- Tracking logic: from intent to effect:
  - CAP (2023–2027) and CPR-based funds have both adopted an effect-based methodology, applying EU coefficients of 0%, 40% and 100%.
  - In the previous programming period, CAP and non-CPR funds and some centrally managed programmes mostly applied intent-based Rio markers.
- Climate tracking: shared principles, diverging practices
  - Both CAP and CPR funds use EU climate coefficients aligned to intervention types or objectives.
  - Non-CPR programmes continue to apply Rio markers or hybrid approaches.
- Biodiversity tracking: CAP tracking is more granular than that of most other EU funds, as it applies biodiversity weighting factors at the level of individual interventions (e.g. eco-schemes), whereas many other funds track at higher aggregation levels.
- Clean air tracking: there are many methodological differences between the funds
  - CAP only tracks clean air through the EAFRD.
  - Non-CAP funds apply EU clean air markers more consistently across CPR and non-CPR funds, particularly ERDF, CF, LIFE and CEF, as well as Horizon Europe.
- Management mode: more precision in centrally managed funds
- CPR vs. non-CPR programmes: structured vs. flexible
  - CPR-regulated funds benefit from predefined intervention field lists and methodological alignment across climate and biodiversity tracking.
  - Non-CPR funds use bespoke methods, offering flexibility but limiting comparability.

5.3.1. Methodological approach

The comparative analysis presented in this chapter builds on the findings of SQs 1 and 2, which provide detailed information on the budget tracking methodologies used across EU funds for climate, biodiversity, and clean air objectives. The aim of SQ3 is to identify both the key similarities and the differences in how the CAP and other EU funds track their contributions to these objectives. To achieve this, a structured and multi-layered methodological approach was adopted.

5.3.1.1. Identification of tracking dimensions

The comparison began with the systematic identification of the core methodological features underpinning the tracking systems used across all relevant EU funds. These features include:

- purpose of tracking;
- type of markers/coefficient systems used (e.g. Rio markers, EU coefficients);
- level of application (e.g. programme level, intervention field, project level);
- regulatory framework (CPR vs. non-CPR);
- management mode (shared vs. centrally managed);
- use of additional weighting factors beyond the EU coefficients or other refinements;
- alignment with policy objectives (e.g. CAP SOs, climate neutrality targets);
- tracking approaches (intent-based vs. effect-based, with important implications for reliability, conservativeness and comparability of tracking results);
- temporal dimension of budget tracking (ex-ante or ex post).

These dimensions were identified based on existing EU guidance, legislation (e.g. Regulation No (EU) 2021/2115, CPR), and analytical studies (e.g. Nesbit et al., 2020; ECA 2021).

5.3.1.2. Combination of EU funds for structured comparison

To enable a more targeted comparison, non-CAP funds were grouped into three main categories based on their regulatory and administrative structure (see table in Annex 3):

- **Shared management funds under the CPR:** these include the ERDF, the CF, the EMFAF and the JTF. These funds follow a harmonised tracking

logic under shared EU–MS responsibility, using intervention fields as the main unit of financial categorisation.

- **Centrally managed non-CPR funds**: this group comprises instruments such as Horizon Europe, NDICI – Global Europe and IPA III. These programmes are managed directly by the Commission and often apply Rio markers at call, project or thematic envelope level. While they offer greater flexibility in marker assignment, they also present challenges in terms of consistency and aggregation across programmes.
- **Dedicated environmental programmes or instruments with bespoke methodologies**: LIFE and the InvestEU 'Sustainable Infrastructure' window fall into this group. These funds have specific environmental objectives and, in most cases, apply more granular markers adapted to their sectoral focus. LIFE will check based on projects, but then allocate a Rio marker strictly on agreed tracking criteria for such tracking coefficients.

5.3.1.3. Integration of policy context and tracking practice

Over the past decade, EU air quality policy has evolved significantly, beginning with the Clean Air Package of 2013, which laid the groundwork for the adoption of the NEC Directive in 2016 and the clean air tracking methodology in 2020**.** The NEC Directive forms a key part of broader EU environmental policy, aligning with successive Environment Action Programmes (EAPs), notably the 6th, 7th, and now the 8th EAP, which reinforces the EU's commitment to achieving "living well, within the limits of our planet.**"** Within the framework of the European Green Deal, air quality is addressed as a core component of the Zero Pollution Action Plan, one of its four environmental pillars. Scientific evidence, including the annual air quality reports by the EEA and the updated WHO Air Quality Guidelines, which recommend stricter pollutant thresholds, has played a central role in shaping policy ambitions. In addition, the Environmental Implementation Reviews support MS in delivering cleaner air through better enforcement and integration of existing EU environmental law. The comparative framework was informed by relevant policy contexts and institutional requirements. Notably, it considered the growing ambition of EU environmental and climate policy over time (e.g. the Biodiversity Strategy 2030), as well as horizontal obligations such as the DNSH principle and the EU's international reporting commitments (e.g. under the CBD and the United Nations Framework Convention on Climate Change (UNFCCC)). These policy shifts have influenced not only the design of environmental interventions but also the tracking systems used to monitor their financial implementation.

5.3.1.4. Data sources

The findings presented in SQ3 are based on triangulated data from a wide range of primary and secondary sources. These include legislative texts (e.g. Regulation 2021/2115, the Common Provisions Regulation, and Regulation (EU) 2021/947 establishing the NDICI - Global Europe), Commission working documents and

methodological guidance (such as the biodiversity tracking manual or clean air tracking methodology), evaluation studies (notably Nesbit et al., 2020 and 2022; Ernst & Young 2017), and reports from the ECA. Additional sources include data and methodological notes from the European Commission's budget performance and transparency websites (DG BUDG), the Cohesion Data platform maintained by DG REGIO, and NECD implementation reports, which provide relevant information on EU funding linked to air pollution control[82].

In summary, the approach combined institutional and regulatory analysis with a functional assessment of methodological tools, organised around comparable dimensions and grouped by fund type. This allowed for a robust assessment of how tracking systems differ across environmental domains and EU funding structures, and for an evidence-based reflection on the strengths and limitations of the CAP's approach compared to that of other funds.

5.3.2. Answer to the study question

5.3.2.1. SQ3.1 Concerning climate budget tracking

Tracking the financial contribution of EU spending to climate objectives is a central element of the Union's strategy to integrate climate action across all policy areas. Since the 2014–2020 MFF, the EU has committed to mainstreaming climate action into its budget, setting quantified targets of at least 20% (2014–2020) and 30% (2021–2027) of total expenditure. This comparative section analyses how climate budget tracking under the CAP differs from, or aligns with, the methodologies used in other EU funds. The following table provides an overview of the key differences and similarities in climate budget tracking between CAP and other EU funds over the two MFF periods, 2014-2020 and 2021-2027.

[82] Clean air tracking DG BUDG: https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/clean-air-tracking_en; Green budgeting DG BUDG: https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting_en; Cohesion data website of DG REGIO: https://cohesiondata.ec.europa.eu/browse

Table 15 - Summary table: Climate tracking comparison (CAP vs. other EU funds)

Comparison dimension	CAP	Other EU funds
Purpose of tracking	To ensure the integration of climate objectives into policy design, resource allocation, and implementation.	To ensure the integration of climate objectives into policy design, resource allocation, and implementation.
Marker type	Rio- markers based EU climate coefficients.	Rio markers (OECD DAC) or adapted CPR coefficients.
Level of application	Intervention level (linked to CAP SO)	Intervention field (CPR) or project/topic level (Horizon, NDICI – Global Europe).
Regulatory framework	Regulation (EU) No 2021/2115 on CSPs; complemented by Commission Implementing Regulation (EU) No 2022/1475 and delegated acts. Climate tracking rules laid down in Article 100 and Annex XI.	Partly CPR, partly non-CPR, partly dedicated environmental programmes with bespoke methodologies.
Tracking approach	Intent-based (2014–2020); Effect-based (2023–2027) with weightings	Mostly intent-based (some ex-post evaluation in Horizon, NDICI – Global Europe)
Weighting factors beyond the EU coefficients	Yes (2023–2027)	No
Management mode	Shared management, uniform EU methodology	Mix of shared and direct management, more flexible implementation.
Temporal dimension	Ex ante budget tracking	Partly ex ante, partly ex post (e.g. Horizon, NDICI – Global Europe)
Alignment with policy objectives	CAP SOs	Climate neutrality

Source: Study team

Purpose of climate tracking

The general purpose of climate tracking is broadly similar across all EU instruments: to ensure the integration of climate objectives into policy design, resource allocation, and implementation. CAP and other EU funds apply tracking to report on progress toward climate spending targets, to support policy evaluation, and to fulfil international reporting obligations (e.g. under the UNFCCC).

A distinct feature of the CAP, however, is its internal climate target of 40% of its total budget (compared to 30% at the EU level). This embeds climate tracking as a core performance measure within the CAP's result-based framework, including annual performance reviews.

Methodological approach

2014–2020

The CAP applied intent-based tracking, using a simplified form of the OECD Rio markers through “EU climate coefficients” (0%/40%/100%). These were assigned to types of payments or priorities:

- DPs (EAGF) were broken down into greening (e.g. permanent pasture = 100%, EFAs = 40%, crop diversification = 0%) and non-greening payments (typically assigned 40% to 20% of the budget share);
- Rural Development (EAFRD) applied coefficients to measures grouped by Focus Areas (e.g. P4 and P5 = 100%);
- This methodology did not distinguish between climate mitigation and adaptation and was criticised by the ECA for overestimating climate relevance, particularly in EAGF;
- Non-CAP funds such as the ERDF, CF, and European Maritime and Fisheries Fund (EMFF) also use Rio marker-inspired coefficients tied to specific intervention fields. Horizon 2020 and LIFE marked at the topic or project level, using ex-post analysis in many cases. However, the application was less harmonised and sometimes more qualitative in centrally managed funds.

2023–2027

A key evolution in the CAP is the shift from an intent-based approach in the previous period to an effect-based approach, retaining the 0% / 40% / 100% coefficients but additionally introducing weighting factors to reflect the estimated actual contribution of each intervention. The total contribution of each instrument is the coefficient times the weighting factor. This is applied to both income support (EAGF) and rural development (EAFRD) as follows:

- eco-schemes are assigned a 100% coefficient and typically a 100% weighting factor, reflecting full relevance to climate objectives;
- BISS and complementary payments are assigned a 40% coefficient, but only a proportion (e.g. 80% of the BISS envelope) is considered relevant via weighting, based on cross-cutting effects or baseline conditions;
- area-based rural development measures are assigned 40% or 100% coefficients, with the weighting factor depending on the share of interventions clearly contributing to environmental and climate objectives (SO4–SO6).

This approach aims to be more conservative, granular and transparent than in the previous period, with less chance of overestimation and precise estimation to the

level of the policy intervention. For non-CAP funds, tracking systems have remained largely stable. Under the 2021–2027 CPR, shared management funds continue to use pre-assigned intervention field codes with corresponding coefficients. Centrally managed funds (e.g. Horizon Europe, NDICI – Global Europe) still use project-level tagging based on Rio markers, with partial ex-ante and ex-post assignment. Notably, no weighting factors are yet applied outside of the CAP, although some funds (e.g. InvestEU) internally use weighting factors to estimate the expected impacts on climate objectives.

Application levels and data granularity

CAP tracking applies coefficients at the intervention level, as defined in the CSPs, linking each intervention to specific SOs. While this methodology is structured and guided by EU-level rules, its implementation at the MS level may vary. MS apply the tracking within their CSPs, including optional use of intermediate weighting factors for biodiversity, which can lead to differences in how coefficients are assigned and documented. This design allows for potentially more granular financial estimates compared to some non-CAP funds, though consistency in application and aggregation across MS remains a challenge. Non-CAP funds, on the other hand, vary:

- CPR funds (ERDF, CF, EMFAF) apply coefficients at the intervention field level, a predefined taxonomy of expenditure categories;
- centrally managed funds often apply markers after project selection, offering more precision but less ex-ante predictability;
- LIFE applies its own tagging scheme, aligned to Rio principles but adapted to programme-specific priorities.

The CAP's structured ex-ante methodology enables more precise aggregation, while non-CAP project-based approaches allow for greater flexibility but face challenges in ensuring consistency.

Differences by management mode

Shared management funds (CAP, ERDF, CF, EMFAF) use harmonised EU-wide methodologies with strong Commission oversight; CPR funds use pre-coded categories, while CAP uses objective-linked intervention coding. Centrally managed funds (Horizon Europe, NDICI) allow for more discretion by Commission services or agencies in applying Rio markers to project proposals or themes. Thematically focused, directly managed funds (e.g. LIFE, InvestEU) apply custom tracking tools tailored to specific policy logic.

It can therefore be concluded that the CAP benefits from a more integrated and formalised climate tracking logic compared to many other funds, owing to its strategic plan architecture and internal budgetary targets.

Conclusion

While climate tracking methodologies across the EU share a common origin in the OECD Rio markers, the CAP stands out for its more structured, formalised, and now effect-based approach. The use of intervention-specific coefficients and weighting factors under CSPs enhances the precision of climate expenditure estimates. Although result indicators are embedded in the performance framework, their application varies across MS and does not yet serve as a consistent verification tool for climate relevance. At the same time, centrally managed programmes offer greater adaptability but face challenges in harmonisation and comparability.

5.3.2.2. SQ3.2 Concerning biodiversity budget tracking

This section analyses the similarities and differences in how biodiversity-related expenditures are tracked under the CAP and other EU funds during the MFF periods 2014–2020 and 2021–2027. The comparison focuses on core methodological elements, including the application of Rio and EU markers, use of weighting systems, levels of granularity, fund governance structures, and alignment with strategic biodiversity goals such as the EU Biodiversity Strategy for 2030.

Biodiversity tracking plays a central role in monitoring compliance with both internal EU commitments and external reporting obligations under the CBD. During both MFF periods, the CAP has represented the largest source of EU biodiversity-related funding. However, the methodologies used to track this funding (and to estimate its impact) differ substantially from those used in other centrally and shared managed EU programmes.

The central methodological similarity between CAP and other EU funds is their reliance on the adapted OECD Rio markers (0%, 40% and 100%) to classify the biodiversity relevance of spending. These markers reflect whether biodiversity is:

- the principal objective of an activity (100%);
- a significant but secondary objective (40%);
- or not relevant (0%).

This common framework ensures a certain level of comparability and enables the Commission to report aggregate biodiversity-related expenditure across the entire EU budget to international stakeholders (e.g. CBD, OECD DAC). Both CAP and non-CAP funds also share the broader aim of mainstreaming biodiversity objectives across all EU policies. For example, budget tracking is used to assess alignment with targets in the EU Biodiversity Strategy for 2030, such as the restoration of ecosystems and the increase in nature-positive public investment.

Methodological approach

Despite the aforementioned shared foundation, the application of biodiversity tracking differs in several important respects between the CAP and other EU funding instruments. These differences relate to the depth of tracking, the application logic, the granularity, the use of weighting factors, the verification processes, and the institutional setting of the respective funds – for an overview, see the following table.

Table 16 - Summary table: Biodiversity tracking comparison (CAP vs. other EU funds)

Comparison dimension	CAP	Other EU funds
Purpose of tracking	Enables the Commission to report biodiversity-related expenditure across the entire EU budget to international stakeholders. Mainstreaming biodiversity objectives across agricultural policy.	Enables the Commission to report aggregate biodiversity-related expenditure across the entire EU budget to international stakeholders. Mainstreaming biodiversity objectives across all EU policies
Type of coefficients	Adapted OECD Rio markers (0%, 40%, 100%)	Adapted OECD Rio markers (0%, 40%, 100%)
Level of application	EAGF: measure level EAFRD: intervention level (CSPs)	LIFE/Horizon: project level ERDF/CF: intervention field level NDICI: programme or geographic pillar
Regulatory framework	Non-CPR	Partly CPR, partly non-CPR
Tracking approach	Evolving from intent-based (2014–2022) to partly effect-based (2023–2027). Risk of overestimation is dealt with through weighting factors. Limited independent verification.	Mostly intent-based, though project-level verification is common in centrally managed funds (e.g. LIFE, Horizon Europe). Attribution is more direct where tagging occurs at the project level. However, where tracking is based on intervention fields (e.g. in shared management funds), the absence of weighting factors may lead to overestimation. Compared to CAP, this approach may be less refined, but also involves fewer assumptions than EAGF-level attribution..
Use of additional weighting factors	Yes: 100%, 70%, 50% (based on SO6 relevance)	No
Management mode	Shared only (via MS CSP)	Mixed: shared + centralised
Alignment with policy objectives	Through CSP design and SO6 flagging	Often directly embedded in project selection or programme goals

Source: Study team

2014-2020

In 2014-2020, both CAP and other EU funds used a broadly intent-based approach, i.e. classifying expenditure based on stated objectives rather than actual results. For the CAP, the biodiversity budget tracking methodology assigned fixed biodiversity coefficients (0%, 40%, or 100%) to specific measures, based on their likely contribution to biodiversity goals. These were applied primarily to Pillar II rural development measures, such as agri-environment-climate schemes, Natura 2000

payments, and organic farming. The methodology also extended to other EU funds, notably the CF and EMFF, using similar coefficient-based tracking. Limitations included a lack of actual impact measurement and reliance on ex-ante estimations. The biodiversity tracking was designed to align with the EU Biodiversity Strategy targets.

2021-2027

In the 2021–2027 period, the CAP shifted to a more effect-based logic, combining intervention objectives with expected outcomes, and using weights to approximate impact. The non-CAP funds, on the other hand, while still intent-based in many areas, often rely on direct project-level assessments, improving attribution. It is therefore reasonable to conclude that the CAP's move toward a more nuanced tracking logic, despite being an ex-ante exercise based on budget allocations rather than on execution, brings it closer to an effect-based model but as such it is still constrained by shared management and national reporting limitations.

In the 2021–2027 period, the CAP introduced a dual-step tracking method combining Rio markers with additional weighting coefficients of 100%, 70% and 50% to refine estimations of biodiversity relevance. These weights are linked to how strongly an intervention supports CAP SO6: halting and reversing biodiversity loss, either solely or in combination with other objectives (SO4 and SO5). Other funds (e.g. LIFE, Horizon Europe, ERDF, NDICI) do not apply this additional weighting step. Instead, Rio markers are used as standalone indicators, based on project, programme, or intervention content. This implies that the CAP's methodology allows greater granularity but may introduce different forms of discretion in how weighting decisions are made and applied. Similarly, the absence of weighting in other funds does not eliminate subjectivity, as Rio marker assignment often relies on interpretative judgment.

Application level and granularity

The level at which the biodiversity tracking is applied varies between CAP and the other funds:

CAP

- EAGF: applied at the measure/type of payment level (e.g. basic payments, eco-schemes); these primarily serve socio-economic objectives but include environmental requirements through conditionality and green architecture;
- EAFRD: applied at the intervention level, based on links to biodiversity-relevant objectives in national CSPs such as organic farming.

Other EU funds

- LIFE, Horizon Europe: project-level tracking, ex-ante based on project proposals;
- ERDF, CF: intervention field level, using predefined codes linked to thematic objectives;
- NDICI: thematic or geographic programme-level tracking, depending on management mode and pillar.

The implication here is that project-level tracking outside the CAP allows for more precise ex-post verification,while CAP's approach relies more heavily on ex-ante estimates based on intervention intent. It is important not to confuse budget tracking, which is by nature ex-ante, with a financial audit, which is by nature ex post. Budget tracking and auditing serve different purposes within public financial management. Budget tracking refers to the systematic monitoring of how budgeted funds are allocated and spent, with the goal of assessing alignment with policy priorities, such as climate action or biodiversity conservation. It is typically forward-looking and relies on predefined classification systems or markers to estimate the share of funding contributing to specific objectives. In contrast, auditing is a retrospective, evidence-based verification of financial transactions and compliance, often conducted by independent bodies to ensure legality, accuracy and efficiency. To assess the tracking methodologies in this study, several key criteria are critical:

1. Clarity and consistency of classification rules (e.g. eligibility criteria or markers like 0%, 40%, 100%);
2. Transparency in data sources and underlying assumptions;
3. Coverage of relevant sectors, instruments, and levels of government;
4. Ability to distinguish between commitments, disbursements, and actual impacts;
5. Verification mechanisms, including whether the system allows for ex post correction or cross-checking.

Differences by management mode

A key structural distinction between the CAP and other EU funding instruments lies in their mode of governance, which directly influences how biodiversity tracking is applied, verified and standardised. The CAP is implemented entirely under shared management, meaning that the Commission sets the overall regulatory framework but MS are responsible for designing and implementing their national CSPs, including how biodiversity objectives are addressed and tracked. Within these CSPs, MS define the specific interventions linked to biodiversity-related objectives (primarily SO6) and apply the corresponding biodiversity coefficients and weighting factors. As a result, the application of the biodiversity tracking methodology under the CAP is centralised but based on information from the Member States in their decentralised CSP, with significant variation across countries in how interventions are structured,

how objectives are flagged and how financial contributions are reported. This decentralisation through the CSP can lead to inconsistencies in interpretation, implementation, and the quality of data across MS, reducing the overall standardisation and comparability of tracking results.

By contrast, other EU funds encompass both shared and centrally managed programmes, with a significant share, particularly in the case of LIFE, Horizon Europe, and NDICI – Global Europe, falling under direct central management by the Commission or its implementing agencies. In these centrally managed programmes, biodiversity tracking is typically carried out at the project or thematic programme level, with the Commission services assigning Rio markers directly based on the content and objectives of funded activities. This model allows for a more uniform and standardised application of the tracking methodology across countries and projects, as well as stronger oversight, control, and quality assurance by the Commission. The application of Rio markers in centrally managed funds is often accompanied by more detailed and extensive documentation, eligibility criteria, and ex-post reporting mechanisms than the CAP, contributing to improved transparency and auditability.

In summary, while the shared management structure of the CAP supports subsidiarity and national participation, it also introduces greater inconsistencies in biodiversity tracking as the tracking methodology is applied in the CSPs by Member States. That said, it should also be recognised that CSPs are based on a format that is to a large extent standardised. In contrast, centrally managed funds offer a higher degree of harmonisation and administrative oversight, enabling the Commission to apply and monitor biodiversity tracking methodologies more consistently and effectively across the EU budget.

Conclusion

Biodiversity tracking under the CAP and other EU funds rests on a shared conceptual foundation but diverges substantially in operational implementation. The CAP introduces a more differentiated approach using both markers and weights, applied through the CSPs and influenced by how MS designs and reports on these plans. This enables a degree of policy integration but can also reduce homogeneity in the application of the tracking methodology due to differences in the CSP as well as standardisation.

Several reports (e.g. by the ECA) flagged concerns regarding transparency and overestimation risks in CAP biodiversity tracking in the period 2014-2020, particularly regarding the estimated contribution of income support payments. This stems from the indirect logic used (e.g. applying a 40% marker to a percentage of DPs due to conditionality) rather than from clear, measurable biodiversity outcomes. In contrast, project-based funding in LIFE and Horizon Europe typically involves explicit biodiversity actions, with a clear budget line and auditable outputs.

EU funds other than the CAP, particularly those centrally managed, apply a more streamlined but arguably more robust model, relying on explicit project intentions and clearer biodiversity outputs, whereas the CAP does not operate by project, so this

limits comparability. Moving forward, increased harmonisation of methodologies and greater integration of ex-post verification tools could improve both accuracy and coherence across the EU biodiversity financing landscape.

5.3.2.3. SQ3.3 Concerning clean air budget tracking

The integration of clean air objectives into EU budgetary tracking is a relatively recent development, with its formalisation only taking shape in 2020. Unlike climate and biodiversity tracking, which have been operational since earlier programming periods, clean air tracking was introduced as a structured and systematic methodology starting in the latter years of the 2014–2020 MFF to help prepare the first implementation report in 2020 for the NEC Directive (adopted in 2016). This sub-question compares how clean air expenditure is tracked under the CAP and other EU funding programmes, focusing on the periods 2014–2020 (extended to 2022) and 2023–2027. The comparison draws on differences and similarities across methodological frameworks, policy integration, and fund governance. It also considers the implications for transparency, accountability, and environmental policy effectiveness.

Purpose of clean air tracking

The purpose of clean air budget tracking in the CAP is to track and encourage changes in FPs that reduce agricultural air pollutants, mainly ammonia (NH_3) from manure, fertilisers, and livestock housing. The goal is to improve agricultural contribution to NEC Directive compliance and air quality co-benefits while also supporting productivity and sustainability. The purpose of budget tracking in other EU funds such as ERDF, CF, LIFE and Horizon Europe is to track investments in infrastructure, innovation, transport, energy, and urban development that reduce air pollution (e.g. PM2.5, NO_x, SO_2). The goal is to mainstream clean air and support structural changes across multiple sectors, including cities, industry, and mobility, to meet zero pollution and climate targets.

Methodological approach

Despite notable distinctions between the CAP and other funds in governance and implementation, the design of clean air tracking systems exhibits several shared elements:

- **Common methodological framework**: both CAP and non-CAP funds apply a three-level EU marker system (100%, 40%, and 0%) to categorise the relevance of an activity to clean air objectives. This approach mirrors the logic of the OECD Rio markers, adapted to the specificities of air pollution and atmospheric emissions.
- **Horizontal policy relevance**: clean air is treated as a cross-cutting issue in both CAP and non-CAP funding. Tracking is mainstreamed in actions in

sectors such as transport, energy, agriculture, and environment, which contribute to air quality.

- **Link to the NEC Directive**: clean air tracking under both the CAP and other EU funds contributes to the EU's reporting obligations under Article 11 of Directive (EU) 2016/2284. This legal requirement serves as a unifying framework for the inclusion of clean air considerations across funding instruments.

Despite the similarities mentioned above, there are quite a few differences with regard to clean air tracking between CAP and other funds. One aspect is **methodological maturity and integration**. In the 2014–2020 period, the CAP did not incorporate clean air tracking in its original architecture. Retrospective assessments under the 2020 NEC Directive Implementation Report estimated clean air relevance using relevant focus areas (e.g. linked to NH_3 and GHG (such as methane) emission reductions). For clean air tracking, NH_3 along with some GHGs (methane, but not CO_2) are relevant, but originally they were combined in one category in the CAP, making it difficult to estimate funding for clean air. From 2023 onward, RIs (R.13 and R.20) were introduced to provide an ex-ante structure, but no CAP-specific clean air weighting coefficients existed. There were tracking problems in the budget cycle 2014-2020 (extended to 2022), with the specific granularity of the CAP from 2023, where a lack of uniformity in CSPs and differences in the application of indicators by MS in these CSPs did not facilitate easy estimates for clean air, making ad hoc analysis of CSPs necessary. For instance, in some CSPs, interventions had a whole range of indicators, making it very hard to assess how much was spent on indicator R.13 and/or R.20, both relevant for clean air. This led to individual assessments by DG AGRI and DG ENV, accepted by DG BUDG.

The clean air tracking method in the CAP, which is basically practice-based tracking in contrast to other EU funds, which apply financial effort- and project-based tracking, remains less formalised and indirect. This differs from other instruments: funds such as ERDF, CF, LIFE, and Horizon Europe apply explicit clean air markers to programme components or projects. In centrally managed funds (e.g. LIFE), the tracking is done at the proposal or project level, allowing for precise attribution and consistent application of clean air relevance. ERDF and CF apply markers to defined intervention fields (e.g. urban mobility, green infrastructure) under shared management, offering a clearer link between policy objectives and tracked expenditures.

Clean air tracking differs further in **scope of tracking and fund coverage**. For CAP, only the EAFRD contributes to clean air tracking. The EAGF is excluded entirely, despite the existence of conditionality elements (e.g. GAEC 6 prohibiting burning of stubble), because of methodological difficulties in isolating clean air impacts and assessing that these benefits are too small to justify a Rio marker of 40%. Within the EAFRD, clean air-relevant contributions are primarily associated with interventions such as precision farming, improved manure storage, and fertilisation techniques. These are captured indirectly via result indicators, but not through earmarked financial markers.

The scope of clean air tracking is broader in other funds because these EU funding programmes have much broader scopes, relevant for clean air, compared to agriculture. In CEF Transport, clean air markers apply to urban nodes, alternative fuels infrastructure, and rail/inland waterways, with some interventions tracked at 100%. In InvestEU, a 40% coefficient is applied to financing linked to pollution reduction and climate mitigation. LIFE assigns 100% markers to clean air–focused projects, including integrated projects and those under governance and information strands. Thus, non-CAP funds have a stronger alignment between financial planning and clean air objectives, supported by intervention-specific or project-level tracking methodologies.

Governance and verification are further aspects highlighting the differences in clean tracking between the CAP and other funds. Clean air tracking under the CAP is subject to significant national discretion, as implementation is decentralised through national CSPs. The absence of a dedicated air quality objective in the CAP's legal framework further weakens central oversight. The Commission provides guidance but does not mandate uniform application or verification of clean air expenditure across MS. Centrally managed programmes (e.g. Horizon Europe, LIFE), on the other hand, allow the Commission to apply markers directly and verify their use consistently. Even under shared management (e.g. ERDF), the inclusion of clean air tracking in Regulatory frameworks like the CPR ensures more harmonised reporting and transparency.

Table 16 presents a comparison of clean air tracking between the CAP and other EU funds. Apart from the CAP, only a few EU funding programmes are tracked for clean air. However, this is not because of negligence but because tracking is limited to those EU funding programmes which are expected to contribute to clean air. After it is known that an EU funding program contributes positively to clean air, e.g. from Work Programmes, t tracking will happen. The shift of an intent-based tracking approach to an effect-based approach means that the tracking becomes more oriented to what was achieved by the financial effort rather than what was intended to achieve.

Table 17 - Summary table: Clean air tracking comparison (CAP vs. other EU funds)

Comparison dimension	CAP	Other EU funds
Purpose of tracking	Tracking and encouraging changes in FPs that reduce agricultural air pollutants	Tracking investments in infrastructure, innovation, transport, energy, and urban development that reduce air pollution (e.g. PM2.5, NO_x, SO_2)
Type of coefficients	Three-level EU marker system (100%, 40% and 0%) based on the logic of the OECD Rio markers	Three-level EU marker system (100%, 40% and 0%) based on the logic of the OECD Rio markers
Level of application	Agricultural practices	LIFE/Horizon: project level ERDF/CF: intervention level
Regulatory framework	Art. 11 NEC Directive, non-CPR	Art. 11 NEC Directive, partly CPR e.g. EFRD
Tracking approach	Primarily intent-based	Mix of intent-based and effect-based. LIFE, Horizon Europe and CF more effect-based
Use of additional weighting factors	No	No
Management mode	Shared	ERDF/CF: shared LIFE/Horizon: centrally
Temporal dimension	Mostly ex-post mix of ex ante and ex post	Mostly ex-ante mix of ex ante and ex post
Alignment with policy objectives	Weak. Through decentralised CSP design and SO5[83] flagging.	Strong. Often directly embedded in project selection or programme goals.

Source: Study team

Application levels and data granularity

The assessment that the positive contribution of the EAGF is relatively small, hence should be 0% for clean air tracking, may contribute to underestimating the policy's overall environmental relevance. While certain practices supported under cross-compliance or eco-schemes, such as cover crops or reduced tillage, may indirectly benefit air quality, these are not consistently tracked under the current methodology. The absence of a dedicated clean air objective within the CAP further limits systematic prioritisation and coordination of air-related interventions.

Differences by management mode

The more advanced integration of clean air tracking in centrally managed funds enables stronger alignment with EU emission reduction targets and contributes more directly to the implementation of the NEC Directive. The non-inclusion of energy efficiency measures in CAP clean air tracking (contrary to ERDF, CEF, and InvestEU) is not optimal, although, unlike other EU funds, energy efficiency spending of the CAP is only a few hundred million euro.

[83] Foster sustainable development and efficient management of natural resources such as water, soil and air.

Conclusion

The tracking of clean air–relevant expenditure remains fragmented across the EU budget, but all non-CAP funds currently offer more structured, comprehensive, and verifiable tracking frameworks than the CAP. While the CAP has taken important steps with the use of result indicators under EAFRD, the overall system still lacks the granularity, institutional commitment, and methodological precision observed in other funds.

5.4. SQ4: Based on current tracking methodologies, what is the estimated budget of the CAP contributing to climate mitigation and to climate adaptation?

SQ4: Based on current tracking methodologies, what is the estimated budget of the CAP contributing to climate mitigation and to climate adaptation?

Key findings:

- The attribution of amounts between CCM and CCA is based on information available in the CSPs when this link exists. For eco-schemes, the attribution is based on the areas of action for Climate Change Mitigation (AOA A) and Climate Change Adaptation (AOA B). For rural development interventions except ANC, the link is established through PMEF indicators. For DPs, the attribution is based on GAEC and their links to CCM and CCA, established through a review of literature and expert opinions. Analysis of ANCs is also based on literature review and expert opinion.
- CCM is precisely defined, including in the PMEF (R.13-R.17 and R.19) whereas CCA is a broad, often context specific concept; several PMEF indicators in addition to R12 were considered to capture the concept of adaptation (R.12, R.14, R.16, R.19, R.21, R.22, R.23, R.24, R.26, R.29, R.34.). Double counting is applied.
- Based on current tracking methodologies, the budget allocated to CCM and CCA is similar. From the budget contributing to CC which was calculated with the current methodology, 56% is attributed to CCM (EUR 72 billion) and 61% to CCA (EUR 79 billion). The interventions contributing most to CCM and CCA are DPs through conditionality and eco-schemes, followed by AECC and investments.

5.4.1. Methodological approach

The agricultural sector accounted for around 11% of the EU's GHG emissions in 2020[84]. Two-thirds of those emissions come from the livestock sector (66%), including 41% from enteric fermentation[85] (mainly methane (CH_4)). The remaining included 35% from nutrients applied to soils (mainly nitrous oxide (N_2O)), 15% from emissions from cropland and grassland (mainly carbon dioxide (CO_2)). Emissions from manure, which represent approximately 30% of the total agricultural emissions, consist of both methane and nitrous oxide and are included in livestock and nutrient emissions.

[84] (EU CAP Network, 2024)

[85] European Environmental Agency. Annual European Union greenhouse gas inventory 1990–2021 and inventory report 2023, April 2023.https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-2

The impact of CC on agriculture varies widely across the EU, reflecting differences in geography (climatic zones and land use), topography (weather systems and areas of natural constraints), extent of development of the agricultural sector (farm structure and modernisation), types of production (arable crops, vegetables and fruits, livestock), farm types and FPs.

Agriculture has significant potential for mitigating CC. Mitigation includes practices that actively reduce GHG emissions[86] and/or increase carbon removal from the atmosphere[87]. It also includes the practices that protect existing carbon sinks by conserving carbon stored in soil or biomass (including grasslands and arable land)[88].

Adaptation involves adjusting to current or expected future climate to reduce risks from the harmful effects of agriculture-related CC impacts (e.g. soil erosion, extreme heat, flooding, drought, sea level rise, increased pests and pathogens, and changes in the growing season). It requires understanding risks from CC at different spatial scales and for different sectors, and establishing effective actions to improve resilience to these. Hence, the concept of climate change adaptation is much broader and both climate risk and context specific, but can be supported by multiple CAP interventions and their associated practices, sometimes in conjunction with mitigation. For example, agricultural practices can help sequester carbon from the atmosphere into soils and biomass (e.g. cover cropping and reduced tillage).[89] In doing so, they also support adaptation by enhancing agriculture's resilience to climate-related impacts.

Current tracking climate expenditure is specified in Article 100 of Regulation (EU) 2021/2115. It includes BISS, CRISS, CIS-YF, eco-schemes, AECC, ANC, other interventions contributing to SO 4, 5 or 6 (area with specific disadvantages (ASD) Article 72 and others). In the 2021-2027 MFF, the climate mainstreaming methodology evolved to an effect-based methodology, against an intent-based methodology in the 2014-2020 MFF. This means that EU climate coefficients are attributed according to the extent to which interventions are expected to help address CC[90].

Current EU tracking methodologies use EU markers, which mark expenditure with a weighting of 0%, 40% or 100% depending on their expected positive contribution to

[86] Reducing emissions from livestock by reducing CH4 emissions from enteric fermentation and manure management, reduction of N2O emissions from manure management and soil management

[87] Enhanced sequestration of carbon from the atmosphere and increase of the carbon stock in biomass and soils.

[88] Carbon storage in soils and biomass includes practices reducing emissions or maintaining or enhancing carbon storage (including permanent grassland, permanent crops with permanent green cover, agricultural land in wetland and peatland)(EU CAP Network, 2024)

[89] (Andrés et al., 2022)

[90] (European Court of Auditors, 2022)

CC. This methodology applies to CAP expenditures. It does not distinguish between climate mitigation and climate adaptation.

Table 18 - Overview of expected CAP contribution to climate objectives per intervention, 2023-2027 period

Intervention	Planned EU expenditure (million EUR)	EU coefficient	Total expected contribution to climate (million EUR)
Pillar 1 - DPs (EAGF)			
BISS	97 068	40%	38 827
CIS-YF	3 400	40%	1 360
CRISS	19 902	40%	7 961
CIS	23 027	0%	0
Eco-schemes	44 438	100%	44 438
Sectoral interventions (apiculture and wine)	4 405	0%	0
Pillar 2 – Rural development (EAFRD)			
ANC	10 355	40%	4 142
RD interventions other than ANC contributing to SO4, 5, 6	33 004	100%	33 004
RD interventions **not** contributing to SO4, 5, 6	20 761	0%	0
Total	**256 361**		**129 732**

Source: Study team's calculations, based on data extracted in March 2025 from the Catalogue of CAP Interventions (Agri-food Data Portal) and Article 100 of Regulation 2021/2115

According to the Commission, the current tracking methodology has the advantage of being simple to implement, at low administrative costs, while providing clear assumptions. However, the current methodology does not distinguish the budgets contributing to CCM and CCA. This means that the contribution towards the reduction of GHG emissions, captured by climate change mitigation measures, has not been assessed.

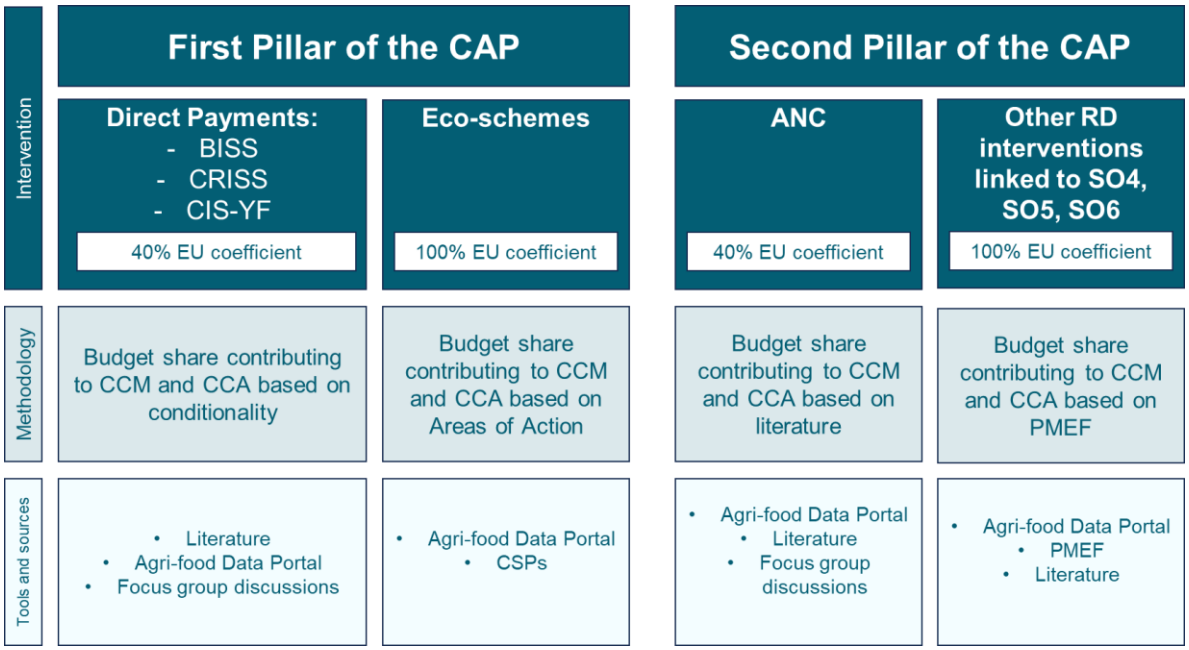
This SQ proposes an approach to allocating the CAP contribution to CCA and CCM based on the budget allocated to climate objectives calculated using the current tracking methodology. The CAP budget contributing to CCM and CCA is estimated separately, allowing for double-counting between CCM and CCA to harmonise the approach to that used by other EU funds. This is because some interventions can support both CCM and CCA.

The definition of CCM is precise (*reducing GHG (CH4, N2O), enhanced sequestration in soil or biomass, or protection of existing carbon stores in soil and biomass, namely carbon sinks*). CCM (as well as CCA) is explicitly linked to "areas of action" for the eco-schemes, and to result indicators of the Performance Monitoring and Evaluation Framework (PMEF) identified in CSPs (see five result indicators) for all CAP Pillar 2 interventions.

Contrary to CCM, CCA is a broad concept, encompassing many dimensions. It covers the concept of resilience and means responding to specific climate risks in a given context. There is no straightforward definition yet, and CCA is less well captured by the current PMEF result indicators.

To identify the contributions to CCM and CCA, the best information on the mitigation and adaptation effects of each type of intervention referenced in the CSPs was used. This is illustrated in the figure below, and described per type of intervention hereafter, starting with eco-schemes, and RD interventions explicitly captured through CSP's and the PMEF, followed by other DPs.

Figure 3 - Proposed approach to allocate the budget between CCM and CCA based on current tracking methodologies



Source: Study team

Eco-schemes

Eco-schemes are marked with a 100% coefficient in the current methodology. For eco-schemes, MS have linked each type of eco-scheme to “Areas of Actions” (AOA)[91]. These explicitly flag the eco-schemes contributing to CCA and CCM. While the AOAs provide explicit information on CCA and CCM, a few limitations should be noted:

- Eco-schemes are designed by the MS and are likely to target climate issues in different ways, notably depending on context. This means that eco-schemes may not be completely comparable.
- MS allocate AOA to their eco-schemes. It is likely that the way AOAs are allocated is heterogeneous across MS and can bias the results.

Interventions linked to AOA A are considered to contribute to climate mitigation. Interventions linked to AOA B are considered to contribute to climate adaptation.

Rural development interventions (except ANC)

For Rural development interventions (CAP Pillar 2) other than ANC, the current methodology marks a 100% coefficient to the interventions linked to SO4, SO5, SO6. Contributions to CCM and CCA for these interventions are assessed through the PMEF result indicators[92]. Indeed, result indicators establish the link between an intervention and its purpose given in the SO (e.g. SO4 “*Contribute to climate change mitigation and adaptation, as well as sustainable energy*”). They are used for target setting and to measure progress towards those targets (performance review).

[91] AOA A climate change mitigation, AOA B climate change adaptation, AOA C protection or improvement of water quality and reduction of pressure on water resources, AOA D prevention of soil degradation, soil restoration, improvement of soil fertility and nutrient biota, AOA E protection of biodiversity, conservation or restoration of habitats or species, AOA F actions for a sustainable and reduced use of pesticides, AOA G actions to enhance animal welfare or combat antimicrobial resistance. Based on Article 31(4) of Regulation 2021/2115.

[92] The performance monitoring and evaluation framework (PMEF) includes a set of output, result and impact indicators tied to the interventions and SOs of the CAP. Included in the annexes of the Regulation (EU) 2021/2115, the PMEF indicators provide the basis for the reporting, monitoring and evaluation of the CSPs during their implementation. Both the output indicators and the result indicators are reported annually via the annual performance report.

Mitigation practices can be explicitly identified in the CSPs; they are linked to the following PMEF result indicators[93] and related practices:

- reducing GHG emissions – e.g., lowering emissions from livestock and manure management (R13, R15);
- enhancing carbon removal from the atmosphere – e.g., sequestration in soils and biomass (R14, R17, R19);
- protecting existing carbon sinks – e.g., conserving carbon in soil and biomass, including grasslands and arable land (R14, R19).

Carbon storage in soils and biomass e.g., maintaining/enhancing storage in permanent grasslands, permanent crops with permanent green cover, and agricultural land in wetlands/peatlands, is captured by R14. FPs enhancing carbon storage include reduced tillage, soil cover with crops, and crop rotation with leguminous crops are captured in R19 – soil management. Afforestation, agroforestry, and restoration of afforested land is captured in R17 and contributes to carbon removal. Investments to produce renewable energy in agriculture, forestry, and other renewable sources, including bio-based energy reduce GHG and are captured by R15. These five result indicators explicitly define CCM.

In contrast, climate change adaptation is broader and focuses on resilience. It depends on the specific climate impacts that farmers need to adapt to and the biogeographical region in which they operate. Some practices support adaptation only in very specific contexts, while others are beneficial across Europe. The latter mainly include practices that promote healthy soils[94]. A wide range of practices contribute to adaptation. Thus, the following indicators are linked to CCA: R.12, R.14, R.16, R.19, R.21, R.22, R.23, R.24, R.26, R.34.

DPs (BISS, CRISS, CIS-YF)

DPs (BISS, CRISS and CIS-YF) are not explicitly linked to SO4, SO5 and SO6 nor to result indicators entailing mitigation or adaptation components. Nevertheless, these interventions are subject to enhanced conditionality, meaning that farmers must implement GAECs (and Statutory Management Requirements (SMR)) to benefit from income support.

To estimate the contribution of DPs to CCA and CCM, each GAEC was analysed through literature review and expert opinion (FGD). Findings from the literature are summarised in Annex 4. Once the contribution of GAEC to CCM and CCA is

[93] MS had relative flexibility when assigning result indicators to interventions: some used a conservative approach (linking interventions to few and the most relevant result indicators), and others linked interventions to a broader range of indicators. This means that the approach is not fully homogeneous across MS.

[94] Healthy agricultural soils have a substantial capacity to reduce CO2 emissions and turn them into a new sink through sequestration (IEEP, 2020). This requires good management practices.

attributed (0%, 40% or 100%), data on areas covered by the relevant GAECs is used to determine the share of DPs to CCM and CCA, as income support is area-based.

GAECs under conditionality are the first step of the green architecture, forming the baseline for greater environmental and climate-related commitments (Recitals 41 and 42 of Regulation (EU) 2115/2021). The first three GAECs contribute to CCM (and CCA) mainly as carbon sink (Annex III of this Regulation (EU) 2115/2021). The literature review and expert opinions (FGD) confirm the role of carbon sinks for the first two GAECs. This role is also extended to GAEC 9[95], which is taken into consideration for the same reason. However, as found through FGDs, expert views on additional carbon sequestration of permanent grassland are more nuanced, as it depends on grassland management practices and its consideration in national legislation.

The ban on burning stubble (GAEC 3) has been adopted to differing extents (and in national legislation) across EU MS. The practice is long abandoned in some MS and included in their national legislation, whereas it persists in parts of Southern and Eastern Europe. As a result, the expected environmental impact of the ban varies significantly across the EU.

Several other GAECs have also been considered for their role in climate action, according to the counterfactual situation. A recent study[96] considered compliance with GAEC 6 – soil cover and GAEC 7 – crop rotation on arable land as essential in contributing to CCM.

To sum up, six GAEC (1, 2, 3, 6, 7 and 9) explicitly contribute to CCM. For GAEC 2, the area of peatland as agricultural land at the EU level is not known. For GAEC 3, the contribution depends on whether the ban is more recently applied or has been around for many years. For GAEC 6 and 7, data on the areas concerned are not available. Thus, in a conservative approach, only the areas of GAEC 1 and GAEC 9 covering 40% of the UAA of the EU could be considered for CCM. The remaining budget is allocated to adaptation to CC (see above).

ANC

For ANC payments, as for the DPs, MS did not link the interventions to SO4, SO5, and SO6 in homogeneous ways; thus, conclusions were drawn based on literature review and not on the PMEF.

Literature and expert opinions (FGDs) showed the highly context-specific effect of ANC regarding alternative land use and practices. The potential counterfactual situation varies considerably depending on the category and location of ANC (intensification notably in areas other than mountain areas, land abandonment or

[95] (European Commission. Directorate General for Agriculture and Rural Development. et al., 2023)

[96] (European Commission. Directorate General for Agriculture and Rural Development. and Alliance Environnement., 2019)

reforestation in mountain areas, etc.). Literature does not link ANC to CCM[97]. Based on these elements, ANC is considered to contribute to CCA only.

5.4.2. Answer to the study question

The results[98] of SQ4, based on the proposed approach, are presented in the table below. Indicatively, just over half (56% - EUR 72 billion) of the planned EU expenditures to climate action for the 2023-2027 CAP is expected to contribute to CCM. 61% of the budget (EUR 79 billion) is expected to contribute to CCA.

Table 19 - Estimated contribution to CCM and CCA based on current methodology (2023-2027 period)

Interventions	Total planned EU expenditures in million EUR (A)	Planned EU expenditures contributing to climate based on current methodologies in million EUR (B)	Planned EU expenditures contributing to CCM in million EUR (C)	Planned EU expenditures contributing to CCA in million EUR (D)
First pillar (P1)	187 835	92 586	52 076	52 079
BISS, CRISS and CIS-YF	120 370	48 148	19 259	28 889
Eco-schemes	44 438	44 438	32 817	23 190
CIS	23 027	-		
Total P1		**49%***	**56%****	**56%*****
Second pillar (P2)	64 121	37 146	20 310	26 507
AECC	21 201	19 211	13 873	16 614
INVEST	17 683	11 042	6 128	5 455
ANC	10 355	4 142	--	4 142
Other RD interventions	14 881	2 750	309	297
Total P2		**58%¨***	**55%****	**71%*****
Sectoral interventions	4 405	0.00		
Total	**256 361**	**129 732**	**72 386**	**78 586**
Share		**51%**	**56%**	**61%**

*B/A; ** C/B *** D/B

Source: Study team, calculated with data retrieved from the Agri-food data portal, Catalogue of CAP interventions

[97] (European Commission. Directorate General for Agriculture and Rural Development. and Alliance Environnement., 2019; EU CAP Network, 2024)

[98] Due to missing data on areas covered by certain GAECs.

The contribution of DPs' income support (BISS, CRISS and CIS YF) is based on the analysis of GAECs. EUR 29 billion is expected to support CCA and EUR 19 billion to CCM.

The contribution of eco-schemes to CCM is larger than for CCA, with EUR 33 billion (74%) expected to contribute to CCM and EUR 23 billion (52%) to CCA.

AECCs support FPs that are beneficial for climate, the environment and animal welfare[99]. Based on the current tracking methodologies, about 90% of AECC are linked to SO4, SO5 and SO6 and therefore contribute to climate objectives. The remaining 10% contribute to animal welfare. Based on PMEF result indicators, 72% of AECC linked to SO4, SO5, SO6 (EUR 14 billion) is expected to contribute to CCM, and 86% (EUR 17 billion) to CCA.

Investments are the second largest component under rural development. About 61% of the investments are linked to SO4, SO5, SO6 and contribute to climate objectives. Investments cover a wide range of support, from farm modernisation, investments in irrigation infrastructure, non-productive investments such as those to protect natural resources etc. Based on PMEF result indicators, 55% (EUR 6 billion) of investments linked to SO4, SO5 and SO6 contribute to CCM and 50% (EUR 5 billion) to CCA.

Other rural development interventions include ASD, Cooperation, installation support, knowledge exchange and risk management. These are relatively smaller in terms of budget compared to the other CAP interventions. Based on the proposed approach, only cooperation's contribution to CCM and CCA could be attributed, with EUR 309 million to CCM and EUR 297 million to CCA. Cooperation, supported under Article 77 of Regulation 2021/2115 includes European Innovation Partnerships projects, Liaison Entre Actions de Développement de l'Économie Rurale (Links between the rural economy and development actions, LEADER), and other forms of cooperation (smart village strategies, support to producer groups, quality schemes etc.). Hence, it includes a wide array of tools with diverse themes centred around cooperation, including in relation to CCA and CCM.

The contribution of ASDs resulting from certain mandatory requirements payments, which include expenditures under Natura 2000 or other protected areas and the WFD (Article 72 of Regulation 2021/2115), could not be assessed. This was also the case for the establishment of young farmers and new farmers, rural business start-up, knowledge exchange and risk management. In principle, these could contribute to CCM and CCA, but they were not flagged as such by the MS. For instance, risk management interventions clearly intervene in support to farmers facing CC impacts.

[99] (Münch et al., 2023)

5.5. SQ5: What are the farming systems/practices supported by CAP DPs and ANC that are considered to contribute positively to climate? Biodiversity? Clean air?

SQ5: Based on existing evidence from studies and evaluations, what are the farming systems/practices supported by CAP DPs (excluding eco-schemes) and ANC that are considered to contribute positively to climate (sub-question 5.1)? biodiversity (sub-question 5.2)? clean air (Sub-question 5.3)?

Key findings:

- Four farming systems have been selected as relevant for SQ5: organic farming, extensive grazing, low-input farming and agroforestry.
- Investigations for agroforestry concluded to exclude this system of further analysis (no data in FADN database, likely high level of double counting).
- Low-input farming refers to agricultural systems with lower use of external inputs such as synthetic fertilisers, pesticides, and herbicides.
- Areas of extensive grazing represent the area under grazing livestock production, where the stocking density does not exceed 1 livestock unit per ha of forage area, as a share of the total UAA.
- The analysis of the contribution of the three farming systems analysed (organic, extensive and low-input) has shown a moderate or highly context dependent contribution of each of the systems to climate (SQ 5.1), biodiversity (SQ 5.2) and clean air (SQ 5.3), except for the contribution of organic farming on biodiversity that is scored with a clear positive impact.

5.5.1. Methodological approach

SQ5 covers DPs (except eco-schemes) and support to ANCs. The question aims to identify farming systems that benefit from DPs and ANCs and have a positive impact on CCM, CCA, biodiversity and clean air.

In this framework, only broad farming systems (e.g. organic farming, extensive livestock in mountain areas, etc.) that have sufficient entity to be linked to DPs or ANCs are considered, which means that data is available to document both the systems and the payments received. Thus, specific FPs such as crop rotation are not part of the scope of the analysis.

Intrinsically, and more so, excluding eco-schemes, DPs are an income support calculated on a per hectare basis. In addition to the SMRs, which are compulsory for agricultural activities, farmers who receive CAP support are subject to GAECs, i.e. they must maintain land in good agricultural and environmental conditions. Since GAECs are the purpose of SQ7, conditionality is not covered in SQ5.

It could be argued that DPs and ANC do not support “directly” any environmental/climate objective and are not linked to specific FPs, hence, their contribution is limited to that associated with the GAECs (SQ7). But concerning DPs and ANC, the study aims to get more granularity on the impact of these interventions on systems with positive impacts on the environment and climate (compared to other farming systems). The intention is to gather all relevant information on DPs and ANC that must be considered in the budget tracking. In that sense, the focus of this question is to assess to what extent CAP funding through DPs and ANCs supports various farming systems that are contributing positively to CCM, CCA, biodiversity and clean air. The farming systems considered positive for the environment typically include those that promote biodiversity and clean air, reduce greenhouse gas emissions, enhance soil health, and conserve water resources (compared to other farming systems).

Regarding the support provided to ANCs, the question highlights the extent to which these payments help maintain extensive and low-input farming systems as a top-up to eco-schemes or AECC directly supporting such practices. We must highlight that payments to ANCs and DPs can be awarded to farmers, regardless of their farming system (for instance, extensive or intensive systems). Thus, the objective is to propose a relevant weighting for ANC and DPs within the budget tracking, based on the farm systems implemented by farms that receive these supports. This approach is founded on desk research and outputs from FGDs.

The overall methodological approach to answer SQ5 is as follows:

- Identifying farming systems that contribute positively to climate, biodiversity and clean air. To answer SQ6, we need to identify farming systems associated with land use or practices that can be linked to CAP budget allocation. Thus, the identified list of farming systems must consider the following criteria:
    - broad farming systems with a **significant area** covered at the EU level (to be linked to DP and ANCs);
    - farming systems with **homogeneous types of impacts** depending on the type of area,
    - farming systems which can be **identified in statistical data** in order to ensure that (at least) some farms that implement these farming systems benefit from DP and ANC payments.
- Qualify their impact on CCM, CCA, biodiversity and clean air.

The level of contribution of each farming system is awarded according to the following scale, defined in the section “FP database” with 0, 1, 2. This scoring is complemented by qualitative comments to characterise these impacts: description of how these farming systems contribute positively to CCM/ CCA / biodiversity / clean

air. Both tasks are based on desk research[100], FADN data and the Agri-food data portal for quantitative evidence, and focus groups.

The main limitation of this method lies in the assessment of the contribution of each system to climate, biodiversity and clean air, particularly in the choice of the baseline to assess this contribution. To address this limitation, baselines are clearly indicated, with scientific evidence to support the arguments behind the scores awarded.

5.5.2. Answer to the study question

Four farming systems have been selected as relevant for SQ5: **organic farming, extensive grazing, low-input farming and agroforestry**.

These four farming systems meet the criteria set out in the methodology (significant area, homogeneous impact and statistical data). They are implemented in the EU by farmers, and contribute positively to the environment (climate, biodiversity, clean air). Farmers may also be beneficiaries of DPs and ANC support on the surfaces where these farming systems/practices are implemented.

5.5.2.1. The specific case of agroforestry

Regarding **agroforestry**, a variable exists in the FADN database (SAGRFR_N: “EFA Hectares of agroforestry. Number of basic units (in hectares)”), but there is no data provided.

Available data regarding the surface of agroforestry in the EU is provided through the Agforward project[101], a four-year EU research project which started in 2014 and ended in 2017. The overall aim of the project was to promote agroforestry practices in Europe. Quantitative data on the extent of agroforestry in the EU provided through this project are based on the Land Use /Cover Area frame Survey (LUCAS)[102]. The data from the Agforward project was updated with the LUCAS database (this tool is updated every three to five years and the latest data is from 2022[103]). More details on the methodology are provided in Annex 5.

At the EU-level, it is estimated that this surface of agroforestry covered 5.9% of the UAA in 2022, with high diversity from one MS to another: from 44% in Greece to 0.04% in Poland.

Considering that:

[100] In the framework of this SQ5, desk research will rely on existing evidence like meta-analysis or systematic review; using the JRC FPEL and the JRC classification as a basis.

[101] https://www.agforward.eu/

[102] https://esdac.jrc.ec.europa.eu/projects/lucas

[103] 2022 - Land cover and use - Eurostat

- the lack of data from the FADN database regarding agroforestry makes it impossible for the estimation of the associated DPs and ANCs (we could have applied the share of surface in agroforestry to the total amount of DPs and ANCs, but it would not have been robust enough);
- there is likely to be a high level of double-counting with the three other farming systems covered (organic, extensive grazing, low-input farming).

In accordance with the experts involved in the FGDs, **it has been concluded to exclude agroforestry from the estimation of the budget of DPs and ANCs that support positive farming systems**.

5.5.2.2. Baseline for the scoring of positive farming systems

The assessment of the contribution of each farming system to climate, biodiversity and clean air requires defining clearly the baseline and the terms of comparison.

Three types of baselines could be envisaged:

- a farm system baseline (e.g. organic vs conventional);
- a farm typology baseline (e.g. livestock vs. plant-based farming);
- territorial comparison (e.g. what alternatives are viable in a specific area).

Thus, context dependency is a critical factor in assessing the environmental impacts of farming systems. The following table shows the baseline chosen for each farming system in the context of the scoring.

A farm system baseline appears to be the most appropriate in the framework of this study. Nevertheless, all farming systems would appear positive if compared to the most environmentally damaging one. That is why the baselines chosen are “average” levels for extensive and low-input farms.

Table 20 - Baseline used for the scoring of positive farming systems (organic, extensive grazing, low-input farming)

Farming system	Baseline choice	Main alert point and comparison issues in case of other baseline approach
Organic farming	Conventional farming	Organic systems often include livestock, which makes their climate impact less favourable if compared to plant-based systems.
Extensive grazing	Farms with medium stocking rates	Compared to a plant-based system, even extensive livestock remains a greenhouse gas emitter.
Low-input farming	Medium-input farms	Lack of a clear definition; environmental benefits may vary from one case to another.

Source: Study team

Nevertheless, some limits and nuances of this baseline approach must be highlighted (these have been highly discussed in the FGD):

- baseline sensitivity: depending on whether we compare to conventional systems or even plant-based systems, outcomes change significantly;
- internal variability: each system may include diverse practices with diverse impacts on climate and environment;
- areas considered: in mountains or arid zones, extensive livestock may be the only available agricultural alternative and can maintain open landscapes with benefits for biodiversity but possible negative impact on climate. Indeed, in mountainous areas, the only other option than extensive grazing farms would be forestry or abandonment.

To conclude, it is important to remember that there is no universally virtuous system. A territorial and balanced approach rather than a binary “good/bad” judgment is key to assess the contribution of each farming system to climate, biodiversity and clean air.

5.5.2.3. Synthesis of the results

The following table presents a synthesis of the results of SQ5 with proposed scoring regarding the contribution of each farming system to CCM, CCA, biodiversity and clean air.

Table 21 – Scoring for the contribution of positive farming systems to climate, biodiversity and clean air

	Organic farming	Extensive grazing	Low-input farming
Climate change mitigation	1b – Impact context-dependent	1a – Moderate impact	1a – Moderate impact
Climate change adaptation	1a – Moderate impact	1a – Moderate impact	1a – Moderate impact
Biodiversity	2 – Significant impact	1b – Impact context-dependent	1b – Impact context-dependent
Clean air	1b – Impact context-dependent	1a – Moderate impact	1b – Impact context-dependent

Source: Study team

In the following sections, detailed scientific evidence is presented to illustrate and explain the proposed scoring for each of the three farming systems identified.

5.5.2.4. Organic farming

Organic management practices for farming involve a set of agricultural techniques aimed at promoting ecological balance, conserving biodiversity, and maintaining soil health. These practices avoid the use of synthetic fertilisers, pesticides, and genetically modified organisms (GMOs) and include the use of practices such as crop rotation, cover crops and stocking limits.[104]

Table 22 - Contribution of organic farming system to climate, biodiversity and clean air

Benefit	Score	Supporting evidence
Climate mitigation	**1b** There is evidence supporting that many practices associated with organic farming improve carbon sequestration and can contribute to reduced emissions. However, the degree of benefit varies significantly from case to case, and in some examples (such as some livestock systems), there is no benefit.	Studies on the impact of organic farming on climate mitigation tend to approach the question by comparing the carbon footprint or levels of GHG emissions between similar organic and non-organic farms. In general, these comparisons tend to show that organic management provides greater benefit in terms of carbon sequestration and absorption of atmospheric methane compared to non-organic management (JRC 2024, Sanders et al 2025). Studies attribute this to the use of cover crops and other practices that support soil health. Organic management is also responsible for lower levels of nitrous oxide emissions compared to non-organic management (JRC 2024, Sanders et al 2025). The degree of that benefit depends on a variety of factors, including the location and size of the farm, type of produce and whether other practices are incorporated in organic management. Studies reviewed suggest that organic **horticulture** especially performs better compared to non-organic production for both carbon sequestration and emissions (Aguilera et al 2013 in JRC 2024). For **livestock systems**, one study reviewed suggested significantly higher carbon sequestration for organic management compared to non-organic management (Gattinger et al 2012 in JRC 2024), but total emissions are comparable and sometimes higher in organic systems (Sanders et al 2025).
Climate adaptation	**1a** There is evidence that practices associated with organic management (regardless of the system) to promote soil health or include landscape elements in farmed land offer benefits for climate adaptation.	Several organic management practices are considered beneficial to climate adaptation. This includes the integration of landscape elements in farmed land, such as hedges or trees, which help to reduce soil erosion. Other practices, such as crop rotation, and the use of cover crops have also been shown to reduce soil erosion. This in turn supports soil fertility and improves the water retention and drainage capacity of the soil, mitigating the potential impact of both flood and drought conditions (El-Hage Scialabba & Mueller-Lindenlauf 2010). These practices are part of organic management, regardless of what is being produced (**arable**, **horticulture** and **livestock** systems).

[104] https://agriculture.ec.europa.eu/farming/organic-farming/organic-production-and-products_en

Benefit	Score	Supporting evidence
Biodiversity	**2** There is evidence to show that organic management enhances biodiversity. However, discussions from the FGDs highlighted that specific benefits will depend on local ecosystems and what is being produced[105].	The majority of studies comparing organic to non-organic management considering biodiversity show that flora abundance is significantly higher in organically cultivated land and fauna abundance is somewhat higher. This is attributed to the lack of chemical herbicides and fertilisers and the lower crop density, providing a better habitat for species (Sanders et al 2025). These practices are part of organic management, regardless of what is being produced (**arable**, **horticulture** and **livestock** systems).
Clean air	**1b** Organic management systems for horticulture and arable farming benefit air quality as compared to conventional farming. There is less clarity on the impact of livestock systems.	The impact of agriculture on air quality can be attributed to both ammonia (NH_3) emissions (for **livestock**) as well as PM2.5, NO_x and methane emissions[106] (for **horticulture** and **arable** farming). Organic management systems have lower rates of emissions (NH_3, PM2.5, NO_x,) on an area basis, due to lower stocking rates.

Source: Study team based on the JRC FPEL, literature review

5.5.2.5. Extensive grazing farms

Extensive grazing refers to raising livestock, such as sheep or cattle, over large areas with minimal human intervention[107]. Areas of extensive grazing measures the area under grazing livestock production (cattle, sheep and goats), where the stocking density does not exceed 1 livestock unit per ha of forage area (forage crops, permanent grassland and meadows), as share of the total UAA[108].

[105] It was mentioned in the focus groups that the biodiversity effect of organic farms with grasslands is very context specific.

[106] As most pesticides are banned in organic management, pesticide emissions are significantly lower (Schader et al 2012). But these would not be in the scope of EU clean air acquis..

[107] "Minimal human intervention" refers to the extensive nature of the area but does not mean "low labour force".

[108] https://agridata.ec.europa.eu/Qlik_Downloads/InfoSheetEnvironmental/infoC33.html

Table 23 - Contribution of extensive grazing to climate, biodiversity and clean air

Benefit	Score	Supporting evidence
Climate mitigation	**1a** Extensive grazing has been shown to improve carbon sequestration and reduce emissions as compared to intensive grazing. Nevertheless, these benefits are moderated by the livestock systems.	The use of extensive grazing systems for **livestock** is associated with higher levels of carbon sequestration as compared to more intensive systems across all climates prevalent in Europe (Abdalla et al. 2018). When compared to no grazing, intensive grazing has been shown to increase GHG emissions, while extensive grazing practices show no significant difference in emissions. (Tang et al 2018).
Climate adaptation	**1a** Extensive grazing has shown multiple benefits to soil quality as compared to intensive grazing, supporting climate adaptation. Nevertheless, these benefits are moderated by the livestock systems.	There is evidence that extensive grazing of **livestock** can support overall soil quality, providing significant benefit to water retention and soil erosion, both compared to intensive grazing and to no grazing (Lai & Kumar 2020).
Biodiversity	**1b** There is evidence to suggest that on the whole, extensive grazing supports biodiversity. However, the effect may depend on the specific ecosystem and flora/fauna under consideration.	Extensive grazing of **livestock** shows benefits to plant species richness as compared to more intensive systems (Herrero-Jáuregui & Oesterheld 2018), and to some extent compared to no grazing (Wang & Tang 2019). For fauna, increases in grazing intensity are generally associated with a reduction in diversity, but the specific effect varies depending on the fauna considered (Wang & Tang 2019).
Clean air	**1a** There are some benefits on air quality from extensive grazing as compared to intensive grazing, due to lower ammonia (NH_3) emissions as well as PM2.5, NO_x and methane emissions.	Farming systems that involve low stocking rates lead to lower levels of ammonia (NH_3) emissions as well as PM2.5, NO_x and methane emissions by area. (Schader et al 2012).

Source: Study team based on the JRC FPEL, literature review

5.5.2.6. Low-input farming system

Low-input farming refers to agricultural systems with lower use of external inputs such as synthetic fertilisers, pesticides, and herbicides. Instead, these systems focus on optimising the use of on-farm resources and sustainable practices to maintain productivity and environmental health.[109]

[109] Low-input farming systems | FAO

Table 24 - Contribution of low-input farming system to climate, biodiversity and clean air

Benefit	Score	Supporting evidence
Climate mitigation	**1a** There may be some benefit from certain grassland management practices, but it is not clear to what extent these are necessarily a part of a low-input farming system.	The use of livestock density limits results in lower levels of **livestock**-associated GHG emissions by area (Bielza et al 2025). Managed grassland for **livestock** can contribute to higher levels of carbon sequestration, but its contribution depends on the approach to management, the local ecosystem and how the grassland is used (Klumpp & Fornara 2018).
Climate adaptation	**1a** There may be some benefit from certain grassland management practices, but it is not clear to what extent these are necessarily a part of a low-input farming system.	Managed grassland for **livestock** can support reduced soil erosion, better water retention and drainage. However, the degree of contribution depends on the approach to management, the local ecosystem and how the grassland is used (Klumpp & Fornara 2018).
Biodiversity	**1b** There is evidence to suggest that on the whole, various low-input practices support biodiversity. However, this is context-dependent.	There is limited evidence available on the impact of low stocking density of **livestock** on biodiversity. One study found mixed results: that higher stocking density in a coastal region benefited plant species richness, while lower stocking densities benefited fauna and flower abundance (van Klink et al 2016). Grassland management by grazing in **livestock** systems is generally considered the best option for supporting biodiversity, although in some cases, mowing may be the better management method (Tälle et al 2016). One meta-analysis considering the impact of reduced pesticide use with **permanent crops** shows variable impacts on biodiversity, but suggests that on the whole, low-input methods result in higher richness of biodiversity, but no impact on abundance (Katayama et al 2019).
Clean air	**1b** There are benefits to air quality from reduced ammonia (NH_3) emissions as well as PM2.5, NO_x and methane emissions, following from the same evidence available on organic practices and extensive grazing systems. However, the evidence of this is limited for horticulture and arable crops.	As noted for organic management, lower stocking rates in **livestock systems** also lead to lower levels of ammonia (NH_3) emissions as well as PM2.5, NO_x and methane emissions by area. (Schader et al 2012). Pesticide emissions[110] would also generally be reduced if pesticide use is reduced (for **horticulture** and **arable** farming), contributing to some improvement in air quality (Schader et al 2012), but these are not in the scope of EU clean air acquis.

Source: Study team based on the JRC FPEL, literature review

[110] It must be noted that pesticide emissions are not in the scope of current EU acquis on clean air.

5.6. SQ6: What is the estimated budget from, respectively, CAP DPs and ANC supporting the systems and practices identified in SQ5 contributing to climate? Biodiversity? Clean air?

SQ6: What is the estimated budget from, respectively, CAP DPs (excluding eco-schemes) and ANC supporting the systems and practices identified in SQ5 contributing to climate (sub-question 6.1)? Biodiversity (sub-question 6.2)? clean air (sub-question 6.3)?

Key findings:

- In 2022, 10% of total DPs and 17% of ANCs supported organic farms; this represented an estimated amount of EUR 3.6 billion for DPs and EUR 0.5 billion for ANC.
- In 2022, 25% of DPs and 48% of ANCs supported extensive grazing farms (excluding organic farms); this represented EUR 9.7 billion for DPs and EUR 1.5 billion for ANCs.
- In 2022, 14% of DPs and 9% of ANCs supported low-input farms (excluding extensive and organic farms); this represented EUR 5.2 billion for DPs and EUR 0.3 billion for ANCs.
- Overall and without correcting for double counting, it is estimated that 48% of DPs (EUR 18.5 billion) and 74% of ANCs (EUR 2.3 billion) support “positive farming systems”.
- Considering the contribution of each farming system to climate, biodiversity and clean air (SQ5), a weighting factor of 40% is applied to the estimated budget of DPs and ANCs that support positive farming systems, except for the contribution of organic farming on biodiversity, which is considered with a weighted factor of 100%.
- Thus, for the current programming period, the estimated budget of DPs and ANCs supporting positive farming systems and contributing to climate and clean air is EUR 27 billion for DPs (19%) and EUR 3 billion for ANCs (30%). For biodiversity, these estimated budgets are EUR 36 billion for DPs (25%) and EUR 4 billion for ANCs (40%).

5.6.1. Methodological approach

This SQ is based on the list of farming systems identified in SQ5. For each system, the aim is to estimate the budget of DPs and ANCs allocated to the areas or farms on which these systems are implemented.

Step 1: Calculation of the indicators to identify farms covered by the three farming systems

This calculation is primarily based on FADN past data (use of individual data); 2022 was the most recent data when this study has been conducted. The FADN database provides representative data regarding: CAP support and subsidies, region, economic size and type of farming.

Both payments for DPs and ANCs received by EU farms can be identified with FADN data. The table with the detailed variables considered in the FADN database regarding DPs and ANCs payments is available in Annex 6.

Regarding the three farming systems identified in SQ5, the coverage in the FADN database differs:

Organic farming

Organic farms can be identified, as well as DPs and ANCs payments received by these farms, with FADN data, with a higher granularity according to the type of organic farming (arable lands, livestock systems, etc.). The table with the detailed variables considered in the FADN database regarding organic farms is available in Annex 6.

Extensive grazing farms and low-input farming

Both farming systems can be tracked by recalculating the CAP context indicator on farming intensity[111] with FADN data (see detailed description of the methodology below), in order to link with DPs and ANCs received by these farms.

The general methodological approach that is used to define extensive grazing farms and low-input farms to estimate the budget of DPs and ANCs allocated to these farms has been conducted as follows:

1. Identification of extensive grazing farms and low-input farms in the FADN database, based on the indicator of farming intensity that covers two sub-indicators: farm input intensity and farm livestock density. These indicators are part of the set of agri-environmental indicators (indicator C33: Farming intensity[112]).
2. To identify the extensive grazing farms: The livestock density per ha of forage UAA (fodder crops + permanent grassland) is calculated. If the livestock density is less than 1 LU/ha, the observation is classified as extensive; if it is more than 1 LU/ ha the observation is classified as intensive.

[111] https://agridata.ec.europa.eu/extensions/IndicatorsEnvironmental/FarmingIntensity.html

[112] Farming intensity

3. To identify the low-input farms: each farm is classified according to the level of input use per hectare which is calculated on the basis of the spending on purchased inputs per hectare of UAA. Then, the distribution of the UAA is considered by the ranked input intensity in each MS. Finally, three classes of intensity (high, medium, low) are defined by deriving the associated level of input corresponding to the 33rd (q33) and the 66th (q66) quantiles.
4. Identification of DPs (excluding payments for eco-schemes) and ANCs for these extensive and low-input farms.
5. Additional FADN variables were considered to have results according to the type of farming (crops/livestock/mixed). This additional information adds more robustness to the approach, with a higher granularity, to estimate the weight of each type of farming regarding their impact on climate (mitigation and adaptation), biodiversity and clean air. These results have been discussed within the FGDs.

More details on the methodology of calculation of these variables are available in Annex 6.

The calculation of these variables in the FADN database makes it possible to identify the proportion of DPs and ANCs that support positive farming systems.

The calculation of the corresponding budget of DP and ANC supporting positive farming systems is then estimated by applying the proportions calculated above to the total CAP DPs and ANCs:

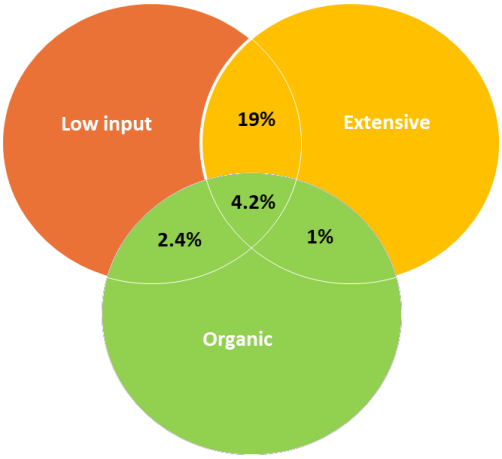
- total DPs received in 2022 are provided per MS by the Agri-food data portal[113];
- ANCs payments in 2022 by MS were provided by DG AGRI services; these data strictly refer to EAFRD funds.

[113] https://agridata.ec.europa.eu/extensions/DashboardIndicators/Financing.html

Step 2: Double counting

To prevent the double-counting of DPs and ANC payments across low-input, extensive, and organic farming systems, the FADN data was carefully filtered to ensure that each farm was assigned to only one system. This approach is illustrated in the Venn diagram below.

Figure 4 - Double counting for the positive farming systems



The extent of potential overlap is highlighted by the percentage distribution of UAA across the three systems. For instance, 19% of the EU's UAA is attributed to low-input and extensive farming (excluding organic), 1% between organic and extensive farming (excluding low-input), and 2.4%[114] between low-input and organic farming (excluding extensive). Additionally, 4.2% of UAA falls under all three systems simultaneously.

To address this and avoid double counting in the FADN analysis, the farming systems were clearly separated:

- The green area represents organic farming;
- The yellow area represents extensive farming, excluding farms that are also organic;
- The orange area represents low-input farming, excluding farms that are also extensive or organic.

This method ensures that each hectare of UAA, along with its corresponding DP and ANC payments, is attributed to a single farming category only, eliminating any possibility of double-counting.

[114] The overlap between organic and low-input is low as low-input is calculated in euro expenditure and organic farms may have high expenditure too which explains the small overlap between the two farming systems.

Step 3: Estimated budget of DPs and ANCs with positive contribution to climate, biodiversity and clean air

The last step consists of estimating the budget of DPs and ANCs with positive contribution to climate, biodiversity and clean air, based on the scoring carried out in the previous study question (SQ5).

Each score awarded to the contribution of each positive farming system is weighted as follows:

- 0 (no impact) = 0%
- 1a (moderate impact) = 40%
- 1b (impact highly context-dependent) = 40%
- 2 (significant and direct impact) = 100%

Thus, the estimated budgets from steps 1 and 2 are weighted according to their level of contribution to climate, biodiversity and clean air.

Geographical approach and type of farming

Based on FGDs and in order to provide more granularity in the results, it has been agreed to calculate variables at MS level and to provide results at EU-27 level and by geographical region of the EU as follows:

- Northern Europe: Denmark, Estonia, Finland, Latvia, Lithuania, Sweden.
- Western Europe: Austria, Belgium, France, Germany, Luxembourg, Netherlands, Ireland.
- Eastern Europe: Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia.
- Southern Europe (Mediterranean): Croatia, Republic of Cyprus, Greece, Italy, Malta, Portugal, Spain.

Another level of granularity is proposed with a calculation of the variables at EU-27 level by type of farming. Based on the available FADN variables, three groups of farms have been set up:

- Crops: specialist field crops, specialist horticulture, specialist permanent crops, mixed cropping.
- Livestock: specialist grazing livestock, specialist granivores; mixed livestock holdings.
- Mixed: Mixed crops-livestock.

These results by type of farming are presented only for organic farming and low-input farming, as it is not relevant for extensive grazing farms, which are 100% livestock.

5.6.2. Answer to the study question

5.6.2.1. Organic farming

In 2022, it is estimated that **10% of DPs and 17% of ANCs supported organic farms**, which represented an estimated amount of **EUR 3.6 billion for DPs and EUR 0.5 billion for ANCs**.

Farms located in western and southern Europe received a combined 65% of DPs and 66% of ANCs. In these same regions, organic farms attract 7% of DPs over the 10% at the EU level and 11% of ANCs over the 17% at the EU level. It reflects the higher concentration of organic farms in the MS of Western and Southern Europe.

The analysis per type of organic farms (crops, livestock, mixed) highlights the following points:

- the distribution of DPs and ANCs per type of farming to organic farms is similar to the overall distribution of these payments per type of farming for all farms;
- almost 50% of the DPs and 75% of ANCs support livestock farms.

Detailed results are presented in Annex 6.

5.6.2.2. Extensive grazing farms

In 2022, it is estimated that 30% of DPs and 61% of ANCs supported extensive grazing farms, which represented an estimated amount of EUR 11.6 billion for DPs and EUR 1.6 billion for ANCs.

Excluding organic farms from this farming system, it is estimated that **25% of DPs and 48% of ANCs supported extensive grazing farms (excluding organic farms)**, which represented **EUR 9.7 billion for DPs and EUR 1.3 billion for ANCs**.

The regional approach highlights that 13% out of the 25% of DPs and 28% out of the 48% of ANCs that support extensive grazing farms (excluding organic farms) relate to farms located in western EU MS.

The analysis per type of farming (crops, livestock and mixed farms) is not relevant for extensive grazing farming system as it covers exclusively livestock farms. Detailed results are presented in Annex 6.

5.6.2.3. Low-input farming

In 2022, it is estimated that 32% of DPs and 46% of ANCs supported low-input farms, which represented an estimated amount of EUR 12.1 billion for DPs and EUR 1.4 billion for ANCs.

Excluding extensive and organic farms from this farming system, it is calculated that **14% of DPs and 9% of ANCs supported low-input farms (without the extensive and organic ones)**, which represented **EUR 5.2 billion for DPs and EUR 0.25 billion for ANCs**.

The approach by geographical region shows a distribution of DPs and ANCs to low-input farms similar to the overall distribution of these payments for all farms.

The analysis per type of low-input farms (crops, livestock, mixed) highlights the following points:

- Almost half of the DPs and 74% of ANCs support livestock farms (all farming systems included). However, this over-representativeness of livestock farms does not appear in the focus of low-input farms (as most of them are captured in the extensive grazing subset and excluded here).
- 12% out of the 14% of DPs and 7% out of the 9% of ANCs that support low-input farms (excluding the extensive and organic ones) are going to crop-specialised farms.

Detailed results by geographical area and type of farming are presented in Annex 6.

5.6.2.4. Synthesis of steps 1 (calculation of DPs and ANCs for each positive farming system) and 2 (consideration of double counting)

The following table gathers the results of the estimated budgets of DPs and ANCs that support positive farming systems in 2022. Taking into account double counting, it is estimated that **48% of DPs (EUR 18.5 billion) and 74% of ANCs (EUR 2.0 billion) support positive farming systems**.

Table 25 - Estimated budget of DPs and ANCs that support positive farming systems without double counting (2022)

EU-27 level	% of DP	% of ANC	Estimated budget of DP *(million EUR)*	Estimated budget of ANC *(million EUR)*
Organic farms	10%	17%	3 641	456
Extensive grazing farms (w/o organic)	25%	48%	9 678	1 290
Low-input farms (w/o organic and extensive grazing)	14%	9%	5 164	250
Total budget of positive farming systems	48%	74%	18 483	1 996
Other farming systems	52%	26%	19 678	698
Total budget	100%	100%	38 161	2 694

Source: Study based on FADN database and catalogue of CAP interventions (Agri-food data portal)

5.6.2.5. Estimated budget of DPs and ANCs with positive contribution to climate, biodiversity and clean air (step 3)

This last step (step 3) of the analysis of the budgets of DPs and ANCs supporting positive farming systems proposes a weighting of the results in order to consider the impact of each farming system on climate, biodiversity and clean air. These contributions have been assessed in SQ5.

Estimated budget of DPs and ANCs contributing to CCA and CCM (SQ6.1)

The table below summarises the final assessment of the contribution of the three farming systems covered by the analysis to climate.

All systems were scored “1” (moderate contribution or context dependent) regarding their contribution to climate, which is weighted 40%.

The total budget of DPs at EU-27 level for the year 2022 is taken from the CAP planned budget, and the amount considered is EUR 38 161 million (source: Agri-food data portal).

The total budget of ANCs at EU-27 level for the year 2022 has been provided by DG AGRI, and the amount considered is EUR 2 694 million.

Thus, in 2022, **the estimated budget of DPs and ANCs supporting positive farming systems and contributing to climate is EUR 7.4 billion for DPs (19%) and EUR 0.8 billion for ANCs (30%).**

Table 26 - Estimated budget of DPs contributing to CCA and CCM, 2022 (SQ 6.1)

EU-27	Estimated budget of DP to each farming system (A)	Weighting (from SQ5) 1 = 40% 2 = 100% (B)	DP with positive contribution *(million EUR)* (C=A*B)	% of DPs with positive contribution (D=C/EUR 38 161 million of total DPs)
Organic	3 641	40%	1 456	4%
Extensive (w/o organic)	9 678	40%	3 871	10%
Low-input (w/o organic and extensive)	5 164	40%	2 066	5%
Total budget contributing to climate	**18 483**	**40%**	**7 393**	**19%**

Source: Study team based on FADN database and catalogue of CAP interventions (Agri-food data portal)

Table 27 - Estimated budget of ANCs contributing to CCA and CCM, 2022 (SQ 6.1)

EU-27	Estimated budget of ANC to each farming system (A)	Weighting 1 = 40% 2 = 100% (B)	ANC with positive contribution *(million EUR)* (C=A*B)	% of ANCs with positive contribution (D=C/EUR 2 694 million of total ANCs)
Organic	456	40%	183	7%
Extensive (w/o organic)	1 290	40%	516	19%
Low-input (w/o organic and extensive)	250	40%	100	4%
Total budget contributing to climate	**1 996**	**40%**	**798**	**30%**

Source: Study team based on FADN database and catalogue of CAP interventions (Agri-food data portal)

Based on these shares and considering the planned EU expenditure of the current programming period (2023-2027), the estimated budget of DPs and ANCs supporting positive farming systems and contributing to climate is EUR 27 billion for DPs and EUR 3 billion for ANCs.

Estimated budget of DPs and ANCs contributing to biodiversity (SQ6.2)

Regarding biodiversity, all systems were scored “1” (moderate or context relevant) except the contribution of organic farming on biodiversity which was scored 2 (significant impact), which is weighted 100%.

Table 28 - Estimated budget of DPs contributing to biodiversity, 2022 (SQ 6.2)

EU-27	Estimated budget of DP to each farming system (A)	Weighting (from SQ5) 1 = 40% 2 = 100% (B)	DP with positive contribution *(million EUR)* (C=A*B)	% of DPs with positive contribution (D=C/EUR 38 161 million of total DPs)
Organic	3 641	100%	3 641	10%
Extensive (w/o organic)	9 678	40%	3 871	10%
Low-input (w/o organic and extensive)	5 164	40%	2 066	5%
Total budget contributing to biodiversity	**18 483**	**52%**	**9 578**	**25%**

Source: Study team based on FADN database and catalogue of CAP interventions (Agri-food data portal)

Table 29 - Estimated budget of ANCs contributing to biodiversity, 2022 (SQ 6.2)

EU-27	Estimated budget of ANC to each farming system (A)	Weighting 1 = 40% 2 = 100% (B)	ANC with positive contribution *(million EUR)* (C=A*B)	% of ANCs with positive contribution (D=C/EUR 2 694 million of total ANCs)
Organic	456	100%	456	17%
Extensive (w/o organic)	1 290	40%	516	19%
Low-input (w/o organic and extensive)	250	40%	100	4%
Total budget contributing to biodiversity	**1 996**	**54%**	**1 072**	**40%**

Source: Study team based on FADN database and Agri-food data portal

Thus, in 2022, **the estimated budget of DPs and ANCs supporting positive farming systems and contributing to biodiversity is EUR 9.6 billion for DPs (25%) and EUR 1.1 billion for ANCs (40%).**

Based on these shares and considering the planned EU expenditure of the current programming period (23-27), the estimated budget of DPs and ANCs supporting positive farming systems and contributing to biodiversity is EUR 36 billion for DPs and EUR 4 billion for ANCs.

Estimated budget of DPs and ANCs contributing to clean air (SQ6.3)

All systems were scored “1” (moderate or context relevant) regarding their contribution to clean air, which is weighted 40%. Consequently, tables for clean air are exactly the same as for climate, as the weighting is similar and the estimated budgets of DPs and ANCs allocated to these farming systems are the same regardless of what is being considered (climate or clean air).

Table 30 - Estimated budget of DPs contributing to clean air, 2022 (SQ 6.3)

EU-27	Estimated budget of DP to each farming system (A)	Weighting (from SQ5) 1 = 40% 2 = 100% (B)	DP with positive contribution *(million EUR)* (C=A*B)	% of DPs with positive contribution (D=C/EUR 38 161 million of total DPs)
Organic	3 641	40%	1 456	4%
Extensive (w/o organic)	9 678	40%	3 871	10%
Low-input (w/o organic and extensive)	5 164	40%	2 066	5%
Total budget contributing to clean air	**18 483**	**40%**	**7 393**	**19%**

Source: Study team based on FADN database and catalogue of CAP interventions (Agri-food data portal)

Table 31 - Estimated budget of ANCs contributing to clean air, 2022 (SQ 6.3)

EU-27	Estimated budget of ANC to each farming system (A)	Weighting 1 = 40% 2 = 100% (B)	ANC with positive contribution *(million EUR)* (C=A*B)	% of ANCs with positive contribution (D=C/EUR 2 694 million of total ANCs)
Organic	456	40%	183	7%
Extensive (w/o organic)	1 290	40%	516	19%
Low-input (w/o organic and extensive)	250	40%	100	4%
Total budget contributing to clean air	**1 996**	**40%**	**798**	**30%**

Source: Study team based on FADN database and catalogue of CAP interventions (Agri-food data portal)

Thus, in 2022, **the estimated budget of DPs and ANCs supporting positive farming systems and contributing to climate is EUR 7.4 billion for DPs (19%) and EUR 0.8 billion for ANCs (30%).**

Based on these shares and considering the planned EU expenditure of the current programming period (2023-2027), the estimated budget of DPs and ANCs supporting positive farming systems and contributing to clean air is EUR 27 billion for DPs and EUR 3 billion for ANCs.

Synthesis table

The table below summarises the final results of the estimation of the budget of DPs and ANCs supporting positive farming systems and contributing to climate, biodiversity and clean air.

Regardless of what is being considered (climate, biodiversity and clean air), the contribution of DPs is estimated at 19% (EUR 7.4 billion for the year 2022 and EUR 37 billion for a five-year programming period) **and the contribution of ANC is estimated at 30%** (EUR 800 million for the year 2022 and EUR 4 billion for a five-year programming period).

Table 32 - Synthesis table of DPs and ANCs contributing to climate, biodiversity and clean air for the current programming period

EU-27	Climate		Biodiversity		Clean air	
	million EUR	%	*million EUR*	%	*million EUR*	%
DPs	27	19%	36	25%	27	19%
ANCs	3	30%	4	40%	3	30%
Total	30	20%	40	26%	30	20%

Source: Study team based on FADN database and Agri-food data portal

5.7. SQ7: Considering the specific role and mechanisms of the conditionality system (especially the GAECs), what would be the options to best reflect their contributions?

SQ7: Considering the specific role and mechanisms of the conditionality system (especially the GAECs), what would be the options to best reflect their contributions to 7.1 climate? 7.2 biodiversity? Clean air quality?

Key findings:

- Each GAEC can be linked to relevant FPs, and each FP can be assessed in terms of its impact on climate change adaptation, mitigation, biodiversity and clean air.
- Given the land area concerned by each GAEC and total EU DPs (excl. eco-schemes), the amount attributed to each GAEC over the 2023-2027 period can be calculated.
- The GAECs' contribution to climate change adaptation, mitigation, biodiversity and clean air is quantified using the coefficients 0% and 40%, based on the assessment of the FPs.
- For the 2023-2027 CAP, the results show that GAECs 1, 5 and 8 contribute moderately to each horizontal objective (between EUR 18 million and EUR 163 million), GAEC 3 contributes only to clean air (EUR 3 million), and that GAECs 6 and 7 together contribute equally to climate change adaptation, mitigation and biodiversity (around EUR 1 600 million for each horizontal objective per GAEC).
- GAEC 2 was not studied due to data deficiency for historical areas and a lack of detail in many CSPs. GAEC 4 was not studied because of the complexity in estimating the related area, and GAEC 9 is considered to be included in calculations made for GAEC 1.
- The amounts allocated to GAECs 6 and 7 are 91% of the total amount for GAECs, so these two GAECs contribute most to environmental action.

5.7.1. Methodological approach

Conditionality is based on SMRs and GAECs. SMRs are regulatory requirements that shall not be considered in the tracking, while GAECs are additional requirements that may be considered. There are nine GAECs defined at the EU level:

- maintain a certain share of permanent grassland of the total agricultural area (GAEC 1);
- protect wetlands and peatlands (GAEC 2);
- maintain soil organic matter and soil structure through a ban of burning arable stubble (GAEC 3);

- protect water from pollution through the establishment of buffer strips along water courses (GAEC 4);
- prevent soil erosion through relevant practices (GAEC 5);
- protect soil by defining rules for minimum soil cover (GAEC 6);
- preserve the soil potential through crop rotation (GAEC 7);
- maintain non-productive areas and landscape features, and ensure the retention of landscape features through, for example, a ban on cutting hedges and trees during the bird breeding and rearing season (GAEC 8);
- protect environmentally-sensitive permanent grasslands in Natura 2000 sites (GAEC 9).

The general approach for this SQ is to estimate the budget of DPs (excl. eco-schemes) allocated to surface areas where GAECs can have a positive impact on the environment or climate (net impact of GAECs). This SQ has been implemented through five steps and relies heavily on the following sources:

- *Rough estimate of the climate change mitigation potential of the CAP Strategic Plans (EU-27) over the 2023-2027 period* (EU CAP Network, 2025) [115];
- database of FPs, elaborated in the context of this study (see section 3.2.2). based on JRC classification of practices (Angileri, 2024)[116] and the FPEL (JRC) (Schievano et al, 2024)[117].

Step 1 – Estimate of the net impact of GAECs in terms of surface area

The net impact of each GAEC has been estimated based on the EU CAP Network study published in 2025. The study assesses the contribution of the different CAP interventions to CCM over 2023-2027, in addition to the contributions attributable to the previous CAP programs. Among the CAP interventions studied, GAECs' additional impacts for the present programming period were determined. This study has been used for GAECs 1, 5, 6, 7, 8 and 9.

For each GAEC, the amount of avoided GHG emissions over the 2023-2027 CAP was reported. Using the methodology implemented by the EU CAP Network, namely FPs corresponding to each GAEC and the emissions avoided by each, calculations were made to identify the corresponding areas.

For GAEC 3, the estimate is based on data provided by the *National emissions reported to the UNFCCC and to the EU under the Governance Regulation* (EEA,

[115] (EU CAP Network, 2024)

[116] (Angileri, Guerrero, and Weiss, 2024)

[117] (Schievano et al., 2024)

2024)[118]. The EEA report provides an annual value of the EU area where field burning of agricultural residues took place, from 1990 to 2022. Based on the trend observed since 1990, the area subtracted from field burning in the 2023-2027 CAP was estimated.

For GAECs 2 and 4, no sources were available to assess the net impact, therefore these two GAECs have not been taken into account in the methodology.

Step 2 – Estimate of the DPs (excl. eco-schemes) attributed to each GAEC

An estimate of the DPs (excl. eco-schemes) related to the surfaces estimated in step 1 is calculated, based on an average amount of DP (excl. eco-schemes) per hectare at EU level. This covers BISS, CRISS, CIS (excluding the CIS for animal production, which are not related to surface areas) and CIS-YF.

For the period 2023-2027, the total DPs (excl. eco-schemes) considered were EUR 127.3 billion (EUR 143.2 billion if we include CIS for animal production). With an EU UAA of 160.9 million ha, the average DP/ha is estimated at EUR 158/year, and EUR 791 over a 5-year period (2023-2027).

Step 3 – Identification of the relevant FPs for each GAEC

For each GAEC, the EU CAP Network identified the relevant FPs contributing to CCM and the related CSPs. The FPs most relevant for each GAEC have been selected. For instance, for GAEC 5, the number of FPs covering GAEC 5 in the different CSPs varies from 1 to 18. A total of five FPs have been selected to conduct the assessment, on the basis of being most widely selected by MS and most relevant regarding the GAEC: description close to the GAEC's content, practice agronomically well represented on large areas and main crop types, tier 2 FPs whenever possible to have an equivalent level of specificities.

The EU CAP Network study focused on the impact of the CAP on CCM. To take into account FPs related to biodiversity and clean air, additional impacts of agriculture on biodiversity and clean air have been identified in the context of this study (EMEP/EEA, 2023)[119] , mainly pest control product use. Therefore, "P2X - Limitation in use of plant protection products" was added to reflect the diminished use of fertilisers in GAECs 1 and 8. The FPs concerned by each GAEC are listed in Annex 7.

[118] (EEA, 2023)

[119] (EMEP/EEA, 2023)

Step 4 - Defining a score (0/1/2) and a weighting coefficient (0%/40%/100%) based on the impact of each FP on CC, biodiversity and clean air

Through the JRC FPEL assessment on the impacts of FPs on the horizontal objectives, each FP was attributed a score (0/1/2), from 0 (no impact) to 2 (significant impact) (see Table 1 - Description of the scores). FPs' scoring is detailed in Annex 7. Each GAEC was assigned a score equivalent to the corresponding FPs' score, however, a maximum score of 1 was considered for the calculations of DPs, due to a possible risk of overestimation of the impact of GAECs (see feedback from FGD). This translates into a maximum weighting coefficient of 40%.

Step 5 – Assessment of double counting

Double counting among GAECs 1 and 9

GAECs 1 and 9 both focus on grassland. The net impact of GAEC 9 is embedded in GAEC 1, thus, in order to avoid double-counting, no specific analysis has been conducted for GAEC 9.

Double counting among GAECs 5, 6 and 7

Double counting has been identified in the surface areas assessed for the net impacts of GAECs 5, 6 and 7. This is due to overlaps in the associated FPs. The method to assess this double counting is provided in Annex 7.It is based on area associated with each FP and the number of GAEC each FP is relevant to. It has been assessed that double counting for GAECs 5, 6 and 7 reached 27% of the total surface estimated for these GAECs. Thus, the total area for GAECs 5, 6 and 7 was reduced by 27%.

Double counting with positive farming systems

There is double counting between the budget identified under positive farming systems and the contribution of GAECs.

Among the different "positive farming systems":

- organic: we consider that GAECs do not influence organic farming systems , thus we do not consider double counting here (this approach has been validated in the context of focus groups with experts);
- extensive grazing systems and low-input farming:

  these farming systems may be influenced by GAECs 5, 6 and 7 (which means that the "net impact" identified for these GAEC may concern some farms in extensive and low-input farming);

- these farming systems account for 15% of the DPs (excl. eco-schemes, based on FADN data, see SQs 5 & 6), so we consider that 15% of the calculation for GAECs 5, 6 and 7 is a double counting with the calculation of the “positive farming systems;
- the total DPs (excl. eco-schemes) for each GAEC were thus reduced by 15%.

5.7.2. Answer to the study question

For 2023-2027, the contribution of GAECs is estimated at:

- EUR 3 549 million for CC (same amount for CCA and CCM);
- EUR 3 549 million for biodiversity;
- EUR 1 898 million for clean air.

A general overview of the weighting coefficients and amounts attributed to each GAEC is given in the table below.

For each GAEC and for a five-year period, the following table summarises the corresponding area and DPs (excl. eco-schemes), taking into account the calculations explained above to exclude double-counting. For each horizontal objective (CC, biodiversity and clean air), the weighting coefficient is indicated, as well as the resulting DPs (excl. eco-schemes).

As CCA and CCM had the same scores for all GAECs, the score and the corresponding amounts were kept to define CC in general.

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Table 33 - Overview of weighting coefficients and DPs for GAECs (2023-2027 period)

GAEC*	Total area concerned: arable land or grassland (2023-2025) (million ha)	Net concerned area (2023-2025) (million ha)	Total amount of DPs *(million EUR)*	CC**		Biodiversity		Clean air	
				Weighting coefficient	DPs*** *(million EUR)*	Weighting coefficient	DPs*** *(million EUR)*	Weighting coefficient	DPs*** *(million EUR)*
GAEC 1: Maintenance of permanent grassland based on a ratio of permanent grassland in relation to agricultural area.	51	2.2	298.7	40%	119.5	40%	119.5	40%	119.5
GAEC 3: Ban on burning arable stubble.	97	0.1	7.4	0%	0.0	0%	0.0	40%	3.0
GAEC 5: Tillage management	97	3.0	407.6	40%	163.0	40%	163.0	40%	163.0
GAEC 6: Minimum soil cover to avoid bare soils	97	29.7	3 986.4	40%	1 594.6	40%	1 594.6	40%	1 594.6
GAEC 7: Crop rotation in arable land.	97	30.8	4 133.1	40%	1 653.2	40%	1 653.2	0%	0.0
GAEC 8: Minimum share of arable land devoted to non-productive areas and features.	97	0.3	45.7	40%	18.3	40%	18.3	40%	18.3
TOTAL	/	/	127 300	/	3 549	/	3 549	/	1 898

*GAEC 2 was not studied due to data deficiency for historical areas and a lack of detail in eight CSPs. GAEC 4 was not studied due to the complexity in estimating the corresponding area. GAEC 9 is included in GAEC 1.

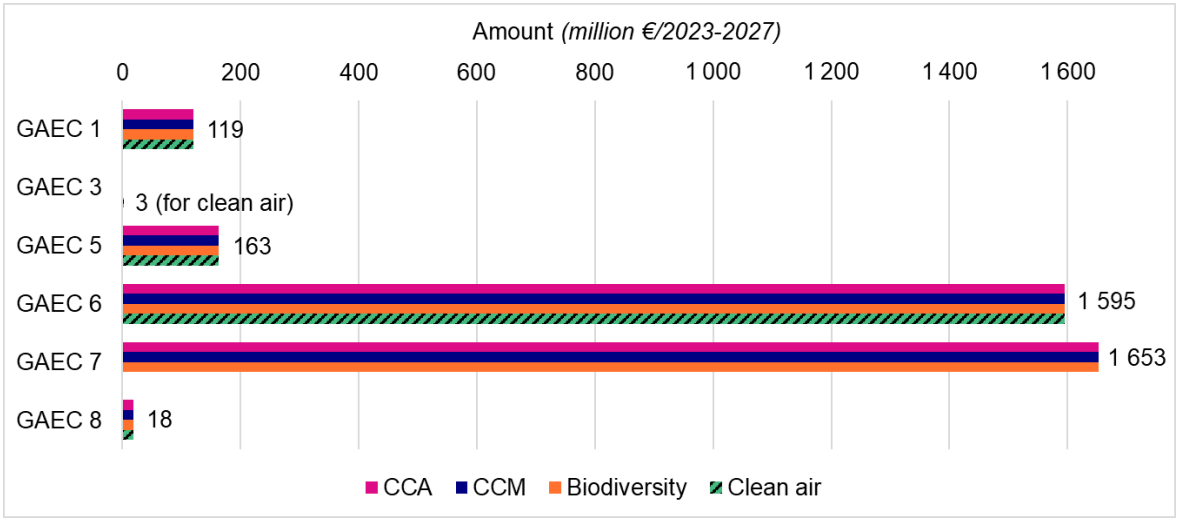
**CC is estimated at the same level as CCA or CCM.

***DPs excl. eco-schemes

Source: Study team elaboration based on several sources

The comparison of each GAEC's contribution to each horizontal objective is detailed in the figure below.

Figure 5 - GAEC contribution to each horizontal objective



Source: Study team

Of the EUR 3 549 million attributed to CCA and CCM, GAECs 6 and 7 are the most significant contributors, each contributing about EUR 1 600 million to both horizontal objectives. The remaining 10% of the DPs is supported by GAECs 1, 5 and 8.

Based on the calculations, the contribution to biodiversity is comparable to that for CCA or CCM.

Even though all GAECs contribute to clean air, the allocated amounts are lower than those allocated to the other horizontal objectives, with a maximum of EUR 1 595 million (GAEC 6). GAEC's 6 contribution to clean air is weighted with a 40% coefficient as it is indirect: part of the FPs of this GAEC (soil cover, green cover, winter and summer cover crops, etc) include a reduction in plant protection products and fertilisers, which have negative impacts on clean air.

GAECs 6 and 7 cover the largest area. For this reason, they are attributed with the largest amount of DPs (excl. eco-schemes), EUR 3 986 million and EUR 4 133 million, respectively, over a 5-year period, which amounts to 90% of the positive contribution attributed to GAECs. Both are weighted with a 40% coefficient for all horizontal objectives, except clean air for GAEC 7. GAECs 6 and 7 contribute to 91% of the GAEC spending for CCA, 91% for CCM and 91% for biodiversity. For clean air, GAEC 6 contributes the amount of EUR 1 595 million. This is 84% of the GAECs' spending for clean air.

GAECs 6 and 7, as well as GAEC 5, cover some of the same FPs and areas: even with the method adopted to avoid double-counting, it is not excluded that such double-counting has interfered with our results.

GAECs 1, 5, 6 and 8 have an impact on all horizontal objectives. The difference in the amounts allocated is due to the differences in the GAECs' areas.

GAECs 1, 5 and 8 have a limited economic contribution, of EUR 163 million maximum, because the area covered by these GAECs is quite small.

GAEC 3 impacts only clean air, slightly, and the area it impacts is very limited. It is the smallest GAEC for clean air, to which it contributes EUR 3 million.

GAEC 8's non-productive areas and landscape features are very positive for climate change adaptation, mitigation and biodiversity, but the small area they represent limits the contribution to these horizontal objectives to EUR 18 million each.

5.8. SQ8: To what extent are current CAP tracking methodologies adequately reflecting contribution of CAP DPs and ANC?

SQ8: To what extent are current CAP tracking methodologies adequately reflecting contribution of CAP DPs (excluding eco-schemes) and ANC to the three horizontal budget objectives in comparison to budget estimations under SQ6 and contributions under SQ7?

Key findings:

- The current methodology on **climate** attributed an overall 34% weighted factor for DPs and 40% for ANCs. Proposed alternative methodologies estimate a weighted factor of 21% for DPs (excl. eco-schemes) and 29% for ANCs. This represents a 36% decrease in the budget of DPs (excl. eco-schemes) and a 28% decrease in the budget of ANCs contributing to climate.
- The current methodology on **biodiversity** attributed an overall contribution of 4% (40% of the coefficient + 10% weighting factor) for DPs and ANCs. The proposed alternative methodologies estimate a contribution of 27% for DPs and 39% for ANCs. This represents a 587% increase in the budget of DPs and a 866% increase in the budget of ANCs, contributing to biodiversity.
- The current methodology on **clean air** attributed a 0% factor for DPs (excl. eco-schemes) and no specific information for ANCs. Proposed alternative methodologies estimate a weighted factor of 20% for DPs (excl. eco-schemes) and 29% for ANCs. This represents a budget of DPs (excl. eco-schemes) and ANCs contributing to clean air estimated at EUR 32 billion that is not identified in the current methodology.

5.8.1. Methodological approach

SQ8 aims to compare current CAP tracking methodologies to assess the contribution of CAP DPs (excluding eco-schemes) and ANCs to the three horizontal objectives (SQ2 and SQ4) with the alternative methodologies proposed and developed in SQ6 and SQ7.

The first step is to remind the current rules for tracking the contribution of CAP DPs and ANCs to climate, biodiversity and clean air, as well as the proposed alternative methodology developed in SQ6 and SQ7.

The second step is to compare the contributions assessed with the different approaches (current methodology onone side and SQ6 and SQ7 on the other side).

This SQ is mainly based on outputs from SQ2, SQ6 and SQ7.

5.8.2. Answer to the study question

5.8.2.1. Step 1 - Description of tracking methodologies

The 2023-2027 CAP reform introduced a harmonised tracking methodology based on EU-specific coefficients (0%/40%/100%), but the approach differs for each of the three horizontal objectives.

Climate tracking

Current methodology

Article 100 of the Regulation (EU) 2021/2115 (CSP Regulation) describes how climate expenditure should be tracked in the CAP. The contribution to achieving the expenditure target is estimated through the application of specific weightings, according to their level of contribution (significant, moderate or no contribution) to achieve CC objectives.

DPs are governed by Article 20 to 41 of the same regulation. Their weightings are applied as follows.

Table 34 - Climate coefficients for DPs and ANCs for 2021-2027

Climate coefficient	DPs and ANC
0%	Coupled DPs interventions in certain sectors
40%	DPs – BISS, CRISS, CIS-YF ANC

Source: Regulation (EU) 2021/2115

Alternative methodology

Three positive farming systems have been selected to represent the potential contribution to environmental objectives. We estimate the budget of DPs and ANCs supporting these systems and contributing to climate objectives (excluding GAECs and eco schemes). It has been estimated that 19% of DPs (excl. eco-schemes) and 30% of ANCs support the positive farming systems that can contribute to the climate.

DPs also rely on conditionality, based on SMRs (not considered in the study), and GAECs. For each GAEC, the area impacted over the 2023-2027 period was evaluated and gave way to an estimate of the related DPs (excl. eco-schemes), taking into account double counting with DPs supporting positive farming systems.

Each GAEC was also linked to a number of FPs, each of which was scored according to its impact on climate (CCA and CCM). GAEC's overall score (0%, 40%, or 100%) was used to estimate the contribution of the DPs.

According to the methodology explained in SQ7, it has been concluded that EUR 3.55 billion contribute to climate (column "CC" in Table 33). This amounts to 3% of the five-year DPs of EUR 127.5 billion (excl. eco-schemes).

Biodiversity tracking

Current methodology

According to SQ2, the biodiversity budget tracking methodology under CAP 2021-2027 applies a 40% EU coefficient to DPs (excl. eco-schemes) and ANCs, with a weighting factor of 10%. This equals an estimated contribution from DPs of 4%.

Alternative methodology

Three positive farming systems have been selected to represent the potential contribution to environmental objectives. We estimate the budget of DPs and ANCs supporting these systems and contributing to biodiversity (excluding GAECs and eco-schemes). It has been concluded that 25% of DPs and 40% of ANCs that support positive farming systems contribute to biodiversity.

DPs also rely on conditionality, based on SMRs (not considered in the study), and GAECs. For each GAEC, the area impacted over the 2023-2027 period was evaluated to provide an estimate of the related DPs, taking into account double counting with DPs supporting positive farming systems.

Each GAEC was also linked to a number of FPs, each of which was scored based on its impact on biodiversity. Each GAEC's overall score (0%, 40%, or 100%) was used to estimate the contribution of the DPs.

According to the methodology explained in SQ7 it has been concluded that EUR 3.55 billion of DPs (excl. eco-schemes) (column "biodiversity" in Table 33), contribute to biodiversity. This amounts to 3% of the five-year DPs of EUR 127.5 billion.

Clean air

Current methodology

The current methodology for clean air is more approximate.

Regarding DPs, considering the difficulty in quantifying this contribution and the expected low value in the overall value of DPs, it was decided to assess the contribution to 0%.

For ANCs, there is no specific information regarding their contribution on clean air.

Alternative methodology

Three positive farming systems have been selected to represent potential contributions to environmental objectives (excluding GAECs and eco-schemes). We estimate the budget of DPs and ANCs supporting these systems and contributing to clean air. It has been concluded that 19% of DPs and 30% of ANCs that support positive farming systems contribute to clean air.

DPs also rely on conditionality, based on SMRs (not considered in the study), and GAECs. For each GAEC, the area impacted over the 2023-2027 period was evaluated and gave way to an estimate of the related DPs, taking into account double counting with DPs supporting positive farming systems.

Each GAEC was also linked to a number of FPs, each of which was scored based on its impact on clean air. GAEC's overall score (0%, 40%, or 100%) was used to estimate the contribution of the DPs.

According to the methodology explained in SQ7 it has been concluded that EUR 1.9 billion of DPs contribute to clean air (column "clean air" in Table 33). This amounts to 1.5% of the five-year DPs of EUR 127.5 billion (excl. eco-schemes).

5.8.2.2. Step 2 - Comparison of the estimated budget of these contributions with current and new alternative methodology

The following tables present the estimated budgets of DPs (excl. eco-schemes) and ANCs that contribute to the three horizontal objectives, calculated with the current methodology and with the alternative methodology proposed in SQ6 and SQ7. More detailed tables are provided on the following pages.

These tables highlight the following points:

- Regarding CC, the proposed alternative methodology estimated a decrease of 35% in the contribution of DPs (excl. eco-schemes) and ANCs compared to the current methodology: from 34% in the current methodology to 22% in the alternative one.
- Regarding biodiversity, the proposed alternative methodology estimated an increase of 606% in the contribution of DPs (excl. eco-schemes) and ANCs compared to the current methodology: from 4% in the current methodology to 28% in the alternative one.
- Regarding clean air, the current methodology was more approximate and concluded to set a 0% contribution of DPs (excl. eco-schemes) and ANCs whereas alternative methodology estimated a 21% contribution of DPs (excl. eco-schemes) and ANCs (EUR 32 bn).

Table 35 - Synthesis of the comparison of current methodology with alternative one for DPs and ANC

Climate coefficient	Current methodology	Alternative proposal	% of change between the 2 methodologies
CC	34 % EUR 52 billion	22 % EUR 34 billion	-35 %
Biodiversity	4 % EUR 6.4 billion	28 % EUR 43 billion	+606 %
Clean air	0 % EUR 0	21 % EUR 32 billion	N/A

Source: Regulation (EU) 2021/2115

Table 36 - Comparison of the estimated budgets of DPs (excl. eco-schemes) and ANCs contributing to the three horizontal objectives - Climate

CLIMATE	Amount of EU spending for all period 2023-2027 (billion EUR)	*Current methodology (SQ2)*		*Proposed alternative methodology*						% Evolution of the amounts
		Weighting	*Amount with positive contribution*	Weighting positive farming system (SQ6)	Amount with positive contribution (SQ6)	Weighting for GAECs (SQ7)	Amount with positive contribution (billion EUR) (SQ7)[120]	Total amount with positive contribution	Average total weighting	
Coupled DPs interventions in certain sectors	23	0%	0	Assessment is aggregated for all DPs in the alternative methodology						
BISS, CRISS and CIS YF	120	40%	48							
Total DPs (excluding eco-schemes)	**143**	**34%**	**48**	19%	27	3%	3.6	**31**	**22%**	**-36%**
ANC	**10**	**40%**	**4**	30%	3	-	-	**3**	**29%**	**-28%**
Total DPs (excl. eco-schemes) + ANC	**153**	**34%**	**52**	20%	30	2%	3.6	**34**	**22%**	**-35%**

Source: SQ2, SQ6, SQ7

[120] This calculation is based on a total amount of DPs of EUR 127 billion (excl. eco-schemes), corresponding to the total DPs (excl. eco-schemes) excluding animal support, as GAECs have no link with livestock production.

Table 37 - Comparison of the estimated budgets of DPs (excl. eco-schemes) and ANCs contributing to the three horizontal objectives - Biodiversity

BIODIVERSITY	Amount of EU spending for all period 2023-2027 (billion EUR)	*Current methodology (SQ2)*		*Proposed alternative methodology*						% Evolution of the amounts
		Weighting	*Amount with positive contribution*	Weighting positive farming system (SQ6)	Amount with positive contribution (SQ6)	Weighting for GAECs (SQ7)	Amount with positive contribution (billion EUR) (SQ7)[121]	Total amount with positive contribution	Average total weighting	
Total DPs (excluding eco-schemes)	**143**	**40% of coefficient + 10% weighting factor**	**6**	25%	36	3%	3.6	**39**	**27%**	**+587%**
ANC	**10**	**40% of coefficient + 10% weighting factor**	**0.4**	40%	4	-	-	**4**	**39%**	**+866%**
Total DPs (excl. eco-schemes) + ANC	**153**	**4%**	**6.4**	26%	40	2%	3.6	**43**	**28%**	**+606%**

Source: SQ2, SQ6, SQ7

[121] This calculation is based on a total amount of DPs of EUR 127 billion (excl. eco-schemes), corresponding to the total DPs (excl. eco-schemes) excluding animal support, as GAECs have no link with livestock production.

Table 38 - Comparison of the estimated budgets of DPs and ANCs contributing to the three horizontal objectives – Clean air

CLEAN AIR	Amount of EU spending for all period 2023-2027 (billion EUR)	*Current methodology (SQ2)*		*Proposed alternative methodology*						% Evolution of the amounts
		Weighting	*Amount with positive contribution*	Weighting positive farming system (SQ6)	Amount with positive contribution (SQ6)	Weighting for GAECs (SQ7)	Amount with positive contribution (billion EUR) (SQ7)[122]	Total amount with positive contribution	Average total weighting	
Total DPs (excluding eco-schemes)	**143**	**0%**	**0**	19%	27	1.5%	1.9	**29**	**20%**	**N/A**
ANC	**10**	**No specific information**		30%	3	-	-	**3**	**29%**	**N/A**
Total DPs (excl. eco-schemes) + ANC	**153**	**0%**	**0**	20%	30	1%	1.9	**32**	**21%**	**N/A**

Source: SQ2, SQ6, SQ7

[122] [122] This calculation is based on a total amount of DPs (excl. eco-schemes) of EUR 127 billion, corresponding to the total DPs (excl. eco-schemes) excluding animal support as GAECs have no link with livestock production.

5.8.2.3. Step 3 - Conclusion of the SQ

The current methodologies are heterogeneous in terms of approach and coverage. While climate tracking provides a weighting for most of the CAP interventions, biodiversity and clean air tracking only focuses on the interventions specifically linked to some indicators or SOs. Thus, biodiversity and clean air remain in an intent-based approach, while climate tracking is more oriented toward a result-based approach (the alternative methodology has also considered a result-based approach).

In addition, the use of scientific evidence is uneven among the current methodologies. The granularity being relatively low, the use of scientific evidence is also highly challenging. This has led to a possible over-estimate of the climate contribution (if we compare current and alternative methodologies) and a possible under-estimation of the contribution for biodiversity and clean air.

When comparing these numbers, it should be remembered that tracking only focuses on positive impacts of the intervention (and does not consider negative impacts), which means that it does not aim to provide a full picture of the CAP impacts.

Compared to the current methodologies, the alternative methodology provides:

- a higher granularity;
- a more scientific approach;
- a result-based approach (meaning that the impacts of an intervention are considered, even if this intervention was not explicitly linked to an environment or climate objective);
- a more comprehensive approach:
    - covering most of the CAP interventions and not focusing on interventions linked to a selection of SOs,
    - proposing a new approach with lower contribution for GAECs (compared to the current assessment for climate) but an assessment of the support to “positive farming systems”;

The alternative approach is highly different from the ones implemented at present; it leads to important changes in the estimated contribution of CAP, in particular for clean air and biodiversity (with significant increases). For climate tracking, the alternative approach provides a lower estimate;

Several limits have been highlighted for the alternative approach (see section 3.2.3) and are linked to:

- the information available on the link between CAP interventions and FPs (due to heterogeneity of CSPs);
- the capacity to conduct in-depth assessments of each FP in each context with the information available (evaluation studies, academic research…);
- the challenges to assess the impacts of CAP intervention at the EU level, with possible leakage effects and complex causality links between CAP interventions and FPs and systems.

5.9. SQ9: What is the estimated budget from Green interventions to Climate? Biodiversity? Clean air?

SQ9: What is the estimated budget from Green interventions (eco-schemes, management commitments, N2000 payment, WFD payment, green investments, sectorial green interventions, etc) contributing to 9.1 Climate? 9.2 Biodiversity? 9.3 Clean air?

Key findings:

- Green interventions are those contributing to environmental or climate objectives, namely SO4 (climate), SO5 (sustainable development and efficient management of natural resources such as water, soil and air), SO6 (biodiversity, ecosystem services, habitats and landscapes). Major green interventions are eco-schemes, AECC and green investments. Together, they represent 96% of the green interventions' budget. These interventions are labelled into FPs by the JRC.
- The approach adopted to estimate the budget from green interventions disentangles the support provided by these interventions with more granularity, mainly based on FPs. Then, EU coefficients are applied according to the expected impact of FPs to the three horizontal objectives. Evidence on the expected impact of FPs is provided by FPEL.
- The estimated budget for green sectoral interventions, representing 1% of the green interventions, relies on ring-fencing requirements specified in the CSP regulation. The estimated budget for other green EAFRD interventions (3%) (ASD (including N2000 and the WFD), cooperation, knowledge exchange, risk management) relies on PMEF result indicators.
- The estimated budget of green interventions per horizontal objective is the following:
  - The contribution to CC amounts to EUR 55.29 billion with allocations of EUR 49.1 billion for CCM and EUR 46.84 billion for CCA. Double counting is taken into consideration. The contribution mainly originates from eco-schemes (55%), AECC (26%) and green investments (15%).
  - The contribution to biodiversity amounts to EUR 60 billion, mainly originating from eco-schemes (63%), AECC (28%) and green investments (8%).
  - The contribution to clean air amounts to EUR 22.13 billion, mainly originating from eco-schemes (68%) and AECC (29%). The concept of clean air has entered the CAP recently and has yet to be integrated homogeneously across MS.

5.9.1. Methodological approach

5.9.1.1. Green interventions

The purpose of this SQ is to assess the contribution of green interventions to the three horizontal objectives. Green interventions are those contributing to environmental or climate objectives SO4 (climate), SO5 (sustainable development and efficient management of natural resources such as water, soil and air), SO6 (biodiversity, ecosystem services, habitats and landscapes).

The following types of interventions in support of the environment, climate and animal welfare are legally considered as “green” interventions:

- Eco-schemes (Article 31) Pillar I;
- AECC (Article 70) – Pillar II;
- Other areas of specific constraints resulting from certain mandatory requirements (Article 72) (Natura 2000, WFD, etc.) - Pillar II;
- Green and non-productive investments (Article 73/74) Pillar II[123];
- Other support to SO4, 5 and 6 (training, cooperation, etc.) Pillar II;
- Sectoral green interventions (Article 47.1) – Pillar I (ring-fencing requirements for wine: at least 5% of the expenditure (see Article 60.4 of Regulation 2021/2115); for fruit and vegetables: at least 15% of the expenditure (see Article 50.7)).

The approach is based on the current EU coefficients applied to the budget of green interventions, but using a greater granularity than in the current tracking methodology. To improve the granularity of the current tracking methodologies, the following approaches were applied:

- For eco-schemes, AECC and green and non-productive investments linked to **SO4, SO5, SO6,** the analysis is based on disentangling these interventions into FPs labelled by JRC and the European Evaluation Helpdesk. These FPs allow to specify the respective support of interventions to the three horizontal objectives (see section 3.4 database of FPs) (e.g. preservation of landscape features (L1x) contributes to biodiversity; soil cover (S2x) contributes to climate change adaptation, etc The four steps of the methodological approach

[123] Productive investments are in some cases key to addressing emissions (CCM), for instance in the case of investments related to livestock. This detailed information is not readily available and more detailed analyses would have been necessary to identify the specific productive investments contributing to this end.

for these three interventions and the assumptions are described hereafter.

- For sectoral interventions, the budget is estimated based on ring-fencing requirements. For other green interventions (e.g. Natura 2000, WFD, cooperation etc.), the budget estimate is based on the PMEF indicators linked to each horizontal objective. The proposed approach was discussed in FGDs with experts in the field.

5.9.1.2. Overall budget of green interventions

The overall budget of green interventions based on the current methodology is provided in the table below. It compares the overall budget of these interventions (eco-schemes, AECC, investments, sectoral interventions for wine and fruits and vegetables, and other RD interventions) and the share of this budget that is allocated to green interventions, i.e., interventions linked to SO4, SO5, SO6[124]. This budget is considered for the proposed approach below.

Table 39: Budget of green interventions compared to the total budget of each intervention (2023-2027, million EUR)

Intervention	Planned EU expenditures (2023-2027) in million EUR	Green interventions in terms of the EU planned EU expenditures (2023-2027) in million EUR	%of green interventions
Eco-schemes	44 438	41 177	93%
AECC	21 203	19 214	91%
Investments	17 689	11 049	62%
ASD	461	461	100%
Cooperation	6 983	1 489	21%
Install	3 403	4	0%
Know	1 124	597	53%
Risk	2 902	200	7%
Sectoral wine and fruits and vegetables	8 420	850	10%
Total	**98 203**	**74 191**	**76%**

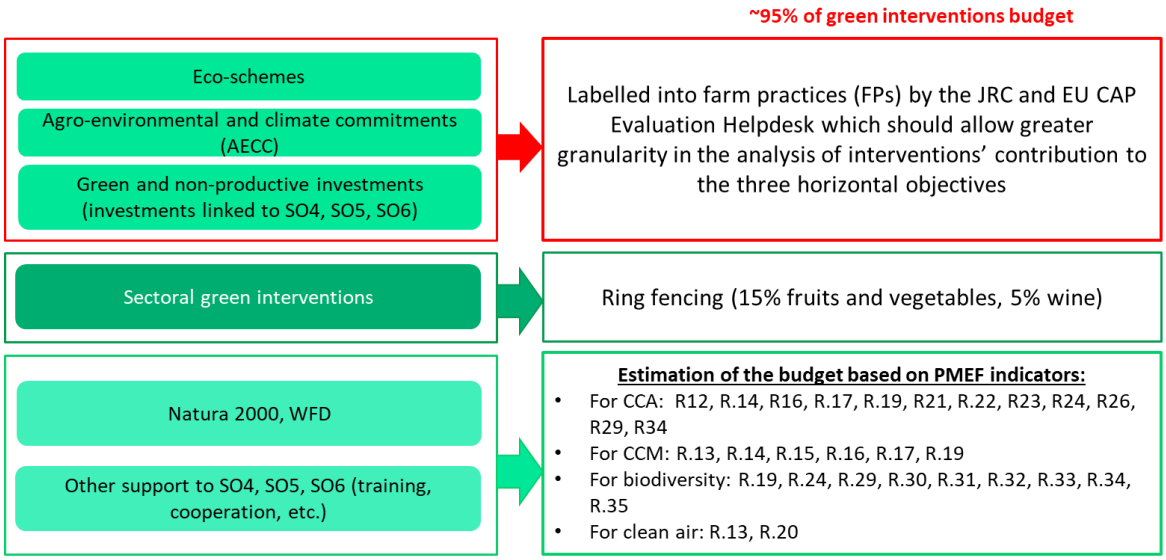
Source: Study team with data from the Catalogue of CAP interventions

[124] Eco-schemes and AECC not linked to SO4, SO5 and/or SO6 are all linked to animal welfare (SO9).

Methodological approach and hypotheses

The approach to assess the contribution of the green interventions to the three horizontal objectives considers the best data available per intervention, as summarised in the following figure. Specifically, three approaches were developed as detailed below.

Figure 6 - Approach to estimate green interventions' contribution to the three horizontal objectives



Source: Study team

5.9.1.3. Approach for eco-schemes, AECC and green investments

The JRC has elaborated a classification scheme of FPs. These are used to report in a common way about the CAP interventions supporting farm practices beneficial to the environment, climate, and animal welfare[125], as defined in the CSPs[126]. The FPs related to these interventions (including per intervention unit amount) are described in the CSPs. CAP interventions have been labelled into FPs in the Agri-food data portal based on JRC classification. The classification is available at the UAC level[127], providing greater granularity on the scope of the

[125] They cover eco-schemes, AECC, green investments and GAEC.

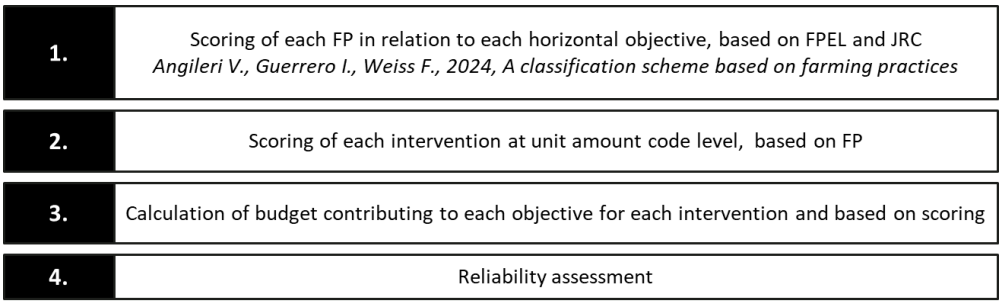
[126] Angileri V., Guerrero I., Weiss F., 2024, A classification scheme based on farming practices

[127] A unit amount is the amount paid to farmers for a supported practice, expressed per hectare or livestock head. Many MS interventions are declined in several unit amounts e.g., for a given eco-scheme or AECC, different unit amounts can be paid depending on the uptake of the intervention. For instance, to qualify for the eco-scheme in France, farmers must

practices (e.g. targeted hectares or livestock heads). This classification enables the specification of respective support of interventions to the three horizontal objectives (climate, biodiversity and clean air).

To estimate the interventions budget for the three horizontal objectives based on FPs, the steps described in the figure below were followed:

Figure 7: Methodological steps to assess contribution of eco-schemes, AECC and investments based on FPs



Source: Study team

Step 1 - Scoring of FPs for each horizontal objective

To assess the contribution of FPs to each horizontal objective, a scoring system was established as described in section 3.4. This system links each FP to a score between 0 and 2 based on the JRC FPEL database and the report '*Classification scheme based on farming practices'* by JRC. A score of 2 represents a direct or significant contribution of the practice to the objective, a score of 1 represents a context-dependent, ambiguous, intermediate, or indirect impact, and a score of 0 denotes that the practice has a low or no contribution to the objective. In addition, FPs could be scored as NA (not available) if evidence is lacking regarding the contribution to the objective[128]. To score FPs as 2, 1 or 0, evidence on the impact of the practice must be available in the FPEL.

choose one of three access pathways. The first is based on sustainable agricultural practices, including crop diversification, non-ploughing of permanent grasslands, and vegetative cover on permanent crops. The second involves full certification of the farm under an environmental scheme such as organic farming, the updated High Environmental Value (HVE) label, or a recognized CE2+ certification. The third pathway requires dedicating at least 7% of the farm's eligible agricultural area to biodiversity-friendly elements such as hedgerows, fallow land, or ponds.

[128] For example, the practice A1X – Improved livestock feeding strategies is considered to have an impact depending on the context on climate change mitigation (score 1) but no impact is defined for biodiversity due to a lack of supporting evidence.

Step 2 - Scoring of each intervention at UAC level, based on FPs

In the Agri-food data portal, each intervention is usually linked to several FPs, which are themselves available at different tiers[129]. This means that each intervention can be linked to FPs with different scores. To estimate the contribution of an intervention at the UAC level to an objective, the FP with the highest score was considered as follows:

- Each UAC *U* is associated with a set of farm practices $P_U = \{p_1, p_2, \ldots, p_n\}$.
- Each practice $p_i \in P_U$ is assigned a score $s(p_i) \in [0,2]$, representing its level of contribution to a horizontal objective.
- The overall score of the intervention S(U) is defined as the maximum value among the scores of the farm practices linked to it:

$$S(U) = \max_{pi \in P_U} s(pi)$$

The following table presents an example of maximum scores attributed to Wallonia's eco-scheme on long-term ground cover. This sub-intervention supports[130] soil cover and soil management through coverage of arable land between January and mid-February (UA 141_a). Related FPs are detailed in the table below and show the diversity of FPs concerned. For the first variant UA 141_a, they include soil management (SX), plant protection (PX) linked to the ban on using certain products for the destruction of the winter crop, as well as crop rotation and diversification (RX)[131].

[129] FPs are established at three tiers, each tier representing a different level of detail, with tier 1 presenting the more generic practices (e.g. S2X soil cover), tier 2 is more detailed (e.g. S23X cover crops) and tier 3 is the most detailed (e.g. S232 winter cover crops). While some interventions/MS provide a great level of detail on the targeted FPs and enable the classification of interventions at tier 3 level, this is not always available for all MS nor all interventions.

[130] The measure is designed as a financial tool to encourage farmers, on a voluntary basis, to improve their intercrop management practices on arable land; to rebalance crop rotations; to (re)integrate temporary grassland into rotations; to maintain or even redevelop permanent grassland areas (CSP BE-Wallonia). This intervention is also expected to contribute to clean air through the ban on the use plant protection products along water courses (P23).

[131] SX-Soil management; S2X-Soil cover; S23X – Cover crops; S232-Winter cover crops.
PX – Plant protection; P2X-Limitation in the use of PPP; P21X Ban on the use of plant protection products other than along water courses.
RX-Crop rotation and diversification; R12X-Cultivation of specific crop or ground of crops; R122 Cultivation of catch crop with potential to attract and feed pollinators; R18 Ban of some crop species.

Table 40 - Example of score attribution based on FP (Long-term ground cover in Wallonia)

				Maximum score		
MS	Intervention	Unit amount	Link to FPs	Climate	Bio-diversity	Clean air
Wallonia	141. Eco-schemes – Long-term ground cover	141_a	SX; PX; RX; GX; S2X; P2X; R1X; G1X; S23X; P21X; R12X; R18; P23; S232; P213; R122	2	2	1
		141_b	SX; PX; RX; GX; S2X; P2X; R1X; G1X; S23X; P21X; R12X; P23; S232; P213; R121	2	2	1
		141_c	SX; PX; GX; S2X; P2X; G1X; S23X; S25; P23; S232	2	1	1

Source: Study team based, own calculations based on Agri-food data portal and JRC FPEL

It should be noted that the data does not specify whether all practices or only a subset of practices must be implemented by the farmer to receive payment. To assess whether the maximum score approach is not overestimated, results are validated through a reliability assessment (see step 4).

Step 3 - Calculation of the budget contributing to each objective for each intervention, based on scoring

To estimate the budget for each intervention, the first step involved calculating the budget at the level of UACs, using data from the *Planning by Intervention Unit Amount* tab of the Catalogue of CAP interventions. This level of detail offers greater granularity than the Catalogue of CAP Interventions and was therefore essential for a more precise assessment. However, it required additional calculations and extensive data preprocessing and validation (see Annex 8).

Then, to estimate the budget of each intervention (eco-scheme, AECC and investments) contributing to each horizontal objective, EU coefficients were applied as follows on the total planned EU expenditures for the 2023-2027 period. The methodology for scoring is detailed in the section “Farming practices (FP) database” (section 3.2.2).

Step 4 - Reliability assessment

To assess the reliability of the assigned scores, a descriptive analysis was first conducted across interventions, at UAC level. Specifically, the distribution of scores for each horizontal objective was examined at tier 1 and tier 2 levels, which offer a balance between granularity and interpretability. Indeed, tier 3

level FPs are very detailed and can mislead the interpretation of results of score distribution[132].

For each intervention with a score of 2 at the UAC level, the number of practices with a score of 0 was calculated. The interventions with a score of 2 but presenting a significant share of practices with a score of 0 (i.e., >25%) and a budget over EUR 10 million were then analysed in detail. This was done through a specific search in the CSPs by experts from the study team in order to verify whether practices with a score of 2 represent a key component of the intervention (e.g. the farmers must implement the best practices to get payment). For biodiversity, two interventions were examined in detail, namely the Spanish eco-schemes on "Carbon Agriculture and Agroecology: Extensive grazing, mowing and biodiversity on wet pastures" and "'Carbon farming and agro-ecology: extensive grazing, mowing and biodiversity in Mediterranean pastures".

For CCM, 27 interventions were analysed e.g., Greece's eco-schemes on "Implementation of improved vegetation cover practices, and creation of enhanced biodiversity areas" or Italy's eco-scheme on "ECO – diagram 2 Insertion of tree crops". For CCA, 28 interventions were analysed, such as Italy's eco-scheme "Figure 4 Extensive fodder systems with rotation" or Poland's eco-scheme on "Carbon farming and nutrient management". For clean air, no interventions met the requirement for the in-depth analysis. All analysed interventions were deemed to contribute significantly to relevant objectives. The complete method and results of this analysis are available in Annex 8.

5.9.1.4. Approaches for other green interventions

The green interventions other than eco-schemes, AECC and green investments have not been classified into FP. Hence, as shown in Figure 7, alternative approaches were used.

For green sectoral interventions, ring-fencing requirements were used (15% for fruits and vegetables and 5% for wine).

PMEF result indicators were used to estimate other green EAFRD interventions' budget (ASD, cooperation, risk management, knowledge exchange). As

[132] For example, the practices related to plant protection (PX) at Tier 3 level include: P211: Ban on herbicides, haulm destructors and moss killers, P212: Ban on fungicides and bactericides, P213: Ban on insecticides and acaricides, P214: Ban on molluscicides, P215: Ban on plant growth regulators, P216: Ban on other plant protection products. These practices are very detailed and numerous. Taking into consideration tier 3 level scores when computing the mean or median of the FP scores of an intervention can be misleading as it can lead to overrepresentation of tier 3 level practices in the analysis.

explained in SQ4, result indicators establish the link between an intervention and its purpose given in the SO (e.g. SO4 "*Contribute to climate change mitigation and adaptation, as well as sustainable energy*"). They are used for target setting and to measure progress towards those targets (performance review).

The PMEF result indicators contributing to each horizontal objective were identified. The selection of result indicators for CCM and CCA is explained in SQ4 (section 5.4.1). It includes the PMEF indicators linked to SO4, SO5, SO6 that contribute to the reduction of GHG emissions/increased carbon storage for CCM (R.13-R.17 and R.19) and indicators contributing to CCA (R.12, R.14, R.16, R.17, R.19, R.21-24, R.26, R.29, R.34).

For biodiversity, all PMEF result indicators linked to SO6 were selected (R.29-R.35) as these directly contribute to biodiversity. In addition, two indicators linked to SO5 were also selected, namely R.19 on Improving and Protecting soils and R.24 on sustainable and reduced use of pesticides.

For clean air, two result indicators were selected, namely R.13 on reducing emissions in the livestock sector (reduction of greenhouse gases and/or ammonia) and R.20 on improving air quality (reduction of ammonia emissions).

The interventions were then analysed using the CAP Catalogue of interventions of the agri-food data portal. The interventions linked to the selected indicators were allocated a 100% coefficient. The interventions not linked to those indicators were allocated a 0% coefficient.

5.9.1.5. Limitations of the approach

The proposed approach presents a series of limitations and mitigation measures, presented in the following table.

Table 41 - Limitations and mitigation measures for SQ9

Limitation	Mitigation measure
Few eco-schemes, AECC and green investments are not linked to FPs. This could be because the FP data is not up to date for all CSPs. In terms of EU planned expenditures, the unavailable data represents 2% of eco-schemes, 3% of green investments, and 4% of AECC.	The contribution of these interventions to the three horizontal objectives is currently not considered. They can be included at a later stage, once the data is updated.
The FP database presents the list of possible FPs that can be implemented by farmers to get payments. In practice, not all of these FPs will be implemented, as it depends on the design of the interventions. Using the best score available for a given intervention could be an overestimation.	Results were validated through a reliability assessment (step 4).
Not all FPs could be allocated a score of 0, 1 or 2 due to the lack of scientific evidence on the impact of the practice in the JRC FPEL.	The JRC FPEL currently provides the best available information on the impact of FPs, based on numerous meta-analyses and hence ensuring that scores are attributed according to scientific evidence. Therefore, only practices for which strong evidence was found were allocated a score.
When assigning result indicators to interventions, MS had relative flexibility: some used a conservative approach (linking interventions to few result indicators only), and others linked interventions to a broader range of indicators. This means that the approach is not fully homogeneous across MS[133]. This limitation was overcome for the bulk of green interventions (including eco-schemes, AECC and green investments which represent over 95% of the green intervention budget) but is applicable to other RD interventions.	This limitation still applies to other RD interventions, but these represent a very limited share of the green interventions budget (3%).
Data provided in the planning by the intervention unit amount dataset in the agri-food data portal presents the unit amount paid per output (i.e., hectare). To calculate the budget at the unit amount level, unit amounts are multiplied by the target output. Depending on the intervention design, some UACs are not linked to target output indicators (e.g. targeted hectares of UAA) at the UAC level, but rather at the intervention level. For these UACs, the budget could not be calculated on this basis.	For the unavailable intervention data at the UAC level e.g. targeted hectares, the study team estimated the data based on the best information available (e.g. spending data, see Annex 8).

5.9.2. Answer to the study question

The following table presents the summary results of the estimation of the contribution of the green interventions to each horizontal objective. These are described by type of intervention in the following sub-sections.

74% of the green interventions' budget is expected to contribute to climate objectives. Eco-schemes are the largest contributor to this objective (around

[133] (European Commission. Directorate General for Agriculture and Rural Development. et al., 2023)

EUR 33 billion), followed by AECC and investments. The share of budget contribution to CCA and CCM is similar, with contributions representing 62% and 65% of the total, respectively.

80% of the green interventions' budget is expected to contribute to biodiversity based on the proposed approach, out of which 63% comes from eco-schemes (EUR 38 billion).

29% of the green interventions' budget is expected to contribute to clean air, of which 68% comes from eco-schemes (EUR 15 billion).

Table 42 - Summary table of green interventions' contribution to climate, biodiversity and clean air

	Green Planned EU expenditures *(million EUR)*	Climate Change	Climate Adaptation	Climate Mitigation	Biodiversity	Clean air
Eco-scheme	41 177	33 310	31 969	30 550	38 065	15 121
AECC	19 214	14 525	9 948	13 759	16 645	6 414
Green investments	11 049	6 294	4 625	4 479	4 964	359
Other green RD interventions	2 751	309	297	309	332	234
Sectoral interventions	850	850	na	na	na	Na
Total	**75 040**	**55 288**	**46 838**	**49 096**	**60 005**	**22 128**
Share of green interventions	***/***	**74%**	**62%**	**65%**	**80%**	**29%**

na: not available

Source: Study team

5.9.2.1. Eco-schemes

The contribution of eco-schemes to the three horizontal objectives, based on the approach adopted, is presented in the following table. It shows that eco-schemes contribute most to biodiversity (EUR 38 billion) followed by CC (EUR 33 billion). Although many FPs supported by eco-schemes are estimated to contribute to climate objectives, 24% of eco-schemes' FPs in terms of EU planned expenditures are allocated a 40% coefficient. For biodiversity, the majority of eco-schemes (89% in terms of EU expenditures) are allocated a 100% coefficient. The lower contribution to clean air can be explained by the fact that most eco-schemes are allocated a 40% coefficient, and a third of expenditures have an undefined impact. Interventions contributing to clean air notably include those addressing the reduction of pesticide use and ammonia emissions.

For each intervention, a set of practices has an undefined impact, meaning that the impact of the practice on the objective could not be assessed with sufficient

evidence by the study team. For climate, these include practices related to Assessment and Management Plans (DX), Certification (X) and animal welfare (AX). For biodiversity, these include practices related to animal welfare (AX), Certification (CX) and Water Management (W1X). For clean air, practices notably include the bioeconomy (BX), the use of fertilisers (F1X), grazing management (GX), landscape features (L1X) and crop rotation (R1X).

Table 43 - Contribution of eco-schemes to climate, biodiversity and clean air based on farming practices methodology

	Climate change		Biodiversity		Clean air	
	EU planned expenditure allocated to each EU coefficient *(million EUR)*	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***
100% coefficient	29 387	29 387	36 697	36 697	6 234	6 234
40% coefficient	9 809	3 923	3 418	1 367	22 218	8 887
0% coefficient	1 058	0	0	0	459	0
Impact not defined	37	0	175	0	11 379	0
FP not available	816	0	816	0	816	0
Total EU planned expenditures for eco-schemes	**41 106**	**33 310**	**41 106**	**38 065**	**41 106**	**15 121**

Source: Study team

The following table presents the estimated contribution of eco-schemes to CCM, CCA and CC based on the proposed approach. It shows that the share of total eco-schemes contributing to each objective is similar (78%, EUR 32 billion for CCA and 74%, EUR 31 billion for CCM)[134].

[134] It should be noted that double counting is applied, meaning that a farming practice that contributes to CCM may also contribute to CCA, e.g. the S23X Cover crops is expected to contribute to both CCA and CCM, although to a different extent. Likewise, a practice that has a positive score for CCM may have an undefined impact on CCA. This is for instance the case for Y11 afforestation of agricultural land. As both CCM and CCA contribute to CC objectives, it is likely that the amount of "impact not defined" is lower for CC than for CCA or CCM.

Table 44 - Contribution of eco-schemes to climate mitigation and climate adaptation based on farming practices methodology

	CCA		CCM		CC	
	EU planned expenditure allocated to each EU coefficient *(million EUR)*	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***
100% coefficient	27 906	27 906	25 572	25 572	29 387	29 387
40% coefficient	10 158	4 063	12 445	4 978	9 809	3 923
0% coefficient	1 320	0	1 293	0	1 058	0
Impact not defined	906	0	981	0	37	0
FP not available	816	0	816	0	816	0
Total EU planned expenditures for eco-schemes	**41 106**	**31 969**	**41 106**	**30 550**	**41 106**	**33 310**

Source: Study team

5.9.2.2. AECC

Based on the proposed approach, the contribution of green AECC to the three horizontal objectives is presented in the following table. As for eco-schemes, AECC is expected to contribute most to biodiversity (86%, EUR 17 billion) followed by CC objectives (75%, EUR 15 billion) and clean air (33%, EUR 6 billion). 67% of AECC (EUR 13 billion) have a 100% coefficient for climate objectives, and 20% of AECC (EUR 4 billion) have a 40% coefficient. For biodiversity, 82% of AECC (EUR 16 billion) are allocated a 100% coefficient. For clean air, 70% of AECC (EUR 13 billion) have a 40% coefficient. These, for instance, include AECC contributing to the reduction of pesticide use and organic farming. 18% of AECC (EUR 3 billion) have an undefined impact.

Table 45 - Contribution of AECC to climate, biodiversity and clear air based on farming practices methodology

	Climate change		Biodiversity		Clean air	
	EU planned expenditure allocated to each EU coefficient *(million EUR)*	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***
100% coefficient	13 016	13 016	15 939	15 939	1 016	1 016
40% coefficient	3 772	1 509	1 764	706	13 494	5 398
0% coefficient	443	0	0	0	196	0
Impact not defined	961	0	490	0	3 486	0
FP not available	1 188	0	1 188	0	1 188	0
Total EU planned expenditures for eco-schemes	**19 381**	**14 525**	**19 381**	**16 645**	**19 381**	**6 414**

Source: Study team

The following table shows the expected contribution of AECC to climate adaptation and climate mitigation based on the proposed methodology. It shows a higher share of AECC expected to contribute to climate change mitigation, with many interventions related to soil management, afforestation and forest management.

Table 46 - Contribution of AECC to climate mitigation and climate adaptation based on farming practice methodology

	CCA		CCM		CC	
	EU planned expenditure allocated to each EU coefficient *(million EUR)*	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***
100% coefficient	6 068	6 068	11 971	11 971	13 016	13 016
40% coefficient	9 698	3 879	4 469	1 788	3 772	1 509
0% coefficient	700	0	613	0	443	0
Impact not defined	1 726	0	1 140	0	961	0
FP not available	1 188	0	1 188	0	1 188	0
Total EU planned expenditures for eco-schemes	**19 381**	**9 948**	**19 381**	**13 759**	**19 381**	**14 525**

Source: Study team

5.9.2.3. Investments

Based on the proposed approach, the contribution of investments to the three horizontal objectives is presented in the following table. It shows that investments are expected to mainly contribute to climate objectives (57%, EUR 6 billion), followed by biodiversity (45%, EUR 5 billion). Clean air has the smallest contribution (EUR 3%, EUR 359 million).

The interventions identified as "Impact not defined" for CC mainly include practices related to Animal Welfare (AX) and Other species (ZX), for biodiversity practices related to Animal Welfare (AX), Manure Management (MX) and Training (TX). For clean air, these include Animal Welfare (AX), Training (TX), Conservation of traditional agricultural landscapes (L4X), Wildlife (ZX), etc.

Table 47 - Contribution of investments to climate, biodiversity and clean air based on farming practice methodology

	Climate change		Biodiversity		Clean air	
	EU planned expenditure allocated to each EU coefficient *(million EUR)*	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***
100% coefficient	4 476	4 476	3 577	3 577	0	0
40% coefficient	4 545	1 818	3 466	1 386	898	359
0% coefficient	1	0	87	0	1 823	0
Impact not defined	1 554	0	3 445	0	7 855	0
FP not available	418	0	418	0	418	0
Total EU planned expenditures for eco-schemes	**10 994**	**6 294**	**10 994**	**4 964**	**10 994**	**359**

Source: Study team

The following table shows the expected contribution of green investments to CCA and CCM based on the proposed approach. It shows a similar contribution for both, with 42% and 41% respectively.

Table 48 - Contribution of investments to climate mitigation and climate adaptation based on farming practice methodology

	CCA		CCM		CC	
	EU planned expenditure allocated to each EU coefficient *(million EUR)*	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***	**EU planned expenditure allocated to each EU coefficient *(million EUR)***	**EU planned expenditures linked to objective *(million EUR)***
100% coefficient	2 682	2 682	3 807	3 807	4 476	4 476
40% coefficient	4 857	1 943	1 680	672	4 545	1 818
0% coefficient	23	0	1	0	1	0
Impact not defined	3 014	0	5 087	0	1 554	0
FP not available	418	0	418	0	418	0
Total EU planned expenditures for eco-schemes	**10 994**	**4 625**	**10 994**	**4 479**	**10 994**	**6 294**

Source: Study team

5.9.2.4. Other interventions

The following table shows the expected contributions of other green interventions (EAFRD and sectoral intervention). Cooperation accounts for the largest share of green interventions, with a budget of EUR 1.49 billion.

From the green intervention budget (EUR 3.6 billion), 32% (EUR 1.16 billion) of the other rural interventions and sectoral interventions budget is expected to contribute to CC, with the Fruits and Vegetables sectoral interventions being the largest contributor (EUR 640 million), followed by cooperation (EUR 310 million).

For biodiversity, 9% (EUR 330 million) of the other rural development interventions and sectoral interventions is expected to contribute to the objective, with cooperation as the largest contributor (EUR 300 million). Based on this methodology, ASD only has EUR 34 million allocated to biodiversity, although it includes support to Natura2000. Indeed, most MS have linked ASD to R.4 and R.7. An in-depth analysis of the CSPs may, however, highlight the

role of ASD in biodiversity through the protection of habitats through grassland management and the preservation of water courses contributing to the protection of species (source: Wallonia CSP, Bulgaria CSP).

For clean air, only two cooperation interventions amounting to EUR 234 million are expected to contribute to the objective based on the proposed approach. This could be explained by the fact that these interventions are rarely associated with clean air PMEF indicators by the MS.

Table 49 - Contribution of other interventions to climate, biodiversity and clean air[135]

Intervention	EU planned expenditures in million EUR	EU planned expenditures linked to SO4, SO5, SO6 (green interventions) in million EUR	EU planned expenditures linked to CC in million EUR	EU planned expenditures linked to biodiversity in million EUR	EU planned expenditures linked to clean air in million EUR
ASD	461	461	0	34	0
Cooperation	6 983	1 489	309	298	234
Installation	3 403	4	0	0	0
Knowledge	1 124	597	0	0	0
Risk management	2 902	200	0	0	0
Sectoral fruits and vegetables	4 288	643	643	0	0
Sectoral wine	4 132	207	207	0	0
Total	**23 293**	**3 601**	**1 159**	**332**	**234**

Source: Study team. Data on sectoral interventions was retrieved from (EUROPEAN COMMISSION–Directorate-General for Agriculture and Rural Development –Unit A.3, 2025)

[135] As described in section 5.9.1, a 100% EU coefficient is applied to interventions linked to the PMEF result indicators relevant to each horizontal objective. The other interventions have a 0% EU coefficient applied.

5.10. SQ10 To what extent are current CAP tracking methodologies adequately reflecting contribution of Green interventions?

SQ10 To what extent are current CAP tracking methodologies adequately reflecting contribution of Green interventions (eco-schemes, management commitments, N2000 payment, WFD payment, green investments, sectorial green interventions, etc) to the three horizontal budget objectives in comparison to budget estimations under SQ9?

Key findings:

- Current tracking methodologies are based on different approaches for each horizontal objective. The methodology is defined most precisely for climate (coefficients assigned at the intervention level). For biodiversity, EU coefficients are assigned in relation to SOs, especially to SO6 (biodiversity). For clean air, the approach relies on PMEF result indicators which mainly capture ammonia emissions.
- The proposed methodology under SQ9 adopts a consistent approach for all horizontal objectives. For eco-schemes, AECC and green investments (i.e., 95% of the green interventions budget), the proposed approach is based on the analysis of FPs to which interventions are linked and relies on scientific evidence on the expected impact of FPs on each horizontal objective.
- The current methodologies lead to approximate assessments of green interventions, with an over- or underestimation of around 25% for climate change and biodiversity, in comparison with the approach under SQ9, mainly based on FPs and existing scientific evidence on their potential impact.
- For climate, the contribution of green interventions under the current methodology amounts to EUR 77.46 billion compared to EUR 55.29 billion under SQ9, i.e. a reduction of 29%. This is explained by the more nuanced approach adopted under SQ9, where between 62-66% of eco-schemes and AECC are allocated a 100% coefficient, and 20-25% are allocated a 40% coefficient. This is due to the granular approach based on the classification of FPs.
- For biodiversity, the contribution of green interventions under the current methodology amounts to EUR 47.39 billion compared to EUR 60 billion under SQ9, representing an increase of 27%. This is explained by the greater budget allocated to eco-schemes (+41%) and AECC (+23%) under SQ9, which was estimated based on the expected contribution of FPs related to biodiversity.
- For clean air, the contribution of green interventions increased from EUR 1.9 billion under the current methodology to EUR 22.13 billion under SQ9. This can be explained by the fact that the current methodology only considers two result indicators mainly linked to ammonia emissions, while the approach under SQ9 also considers FPs that contribute to the reduction of emissions based on the restriction on pesticide and fertiliser use and soil management. In addition, SQ9 adopts a more granular approach based on FP.

5.10.1. Methodological approach

This question concerns the comparison of current tracking methodologies for green interventions and the proposed methodology under SQ9. To answer this question, the current tracking methodology was applied to green interventions for the 2023-2027 period. The current tracking methodologies and the estimated budget based on these were compared with the methodology and results in SQ9. The approach to green interventions under SQ9 was discussed in the FGD with experts in the respective fields.

5.10.2. Answer to the study question

Current tracking methodologies are based on different approaches for each of the horizontal objectives, as described in section 4.3. The methodology currently applied to CAP green interventions for each objective is described, applied and compared to the approach proposed under SQ9.

5.10.2.1. Climate change

The current tracking methodology for climate relies on the application of EU coefficients per intervention. This methodology is described in Article 100 of Regulation 2021/2115 and does not differentiate between climate mitigation and climate adaptation. The table below summarises the current tracking methodology and the approach proposed under SQ9 for climate.

Table 50 - Current tracking methodology for climate and proposed approach (SQ9) for green interventions

	Current methodology	Proposed methodology (SQ9)
Eco-schemes	100% EU Coefficient	100% EU Coefficient on interventions linked to FPs with a clear impact on the objective.
AECC	100% EU Coefficient on interventions contributing to SO4, SO5, SO6	40% EU Coefficient on interventions linked to FPs with a moderate, or context-dependent impact on the objective.
Green investments		0% EU coefficient on FPs with no impact
Other green EAFRD interventions (except ANC)		100% EU Coefficient on interventions linked to R.12-R.17, R.19, R.21-R.24, R.26, R.29, R.34
Sectoral interventions	na	100% EU coefficient with a weighting of 15% for fruits and vegetables and 5% for wine

Source: Study team based on Article 100 of Regulation 2021/2115 and SQ9

The current tracking methodology provides an estimate of the green interventions' contribution to climate without explicit scientific evidence. In contrast, the proposed approach provides greater granularity by considering the implemented FPs and an approach based on scientific evidence to estimate the contribution to CCM and CCA. In addition, sectoral support is not considered in the current methodology although ring-fencing requirements for the 2023-2027 period foresee mandatory support to the environment and climate of at least 5% for the wine sector and 15% for the fruits and vegetables sector.

The following table presents the estimated budget for green interventions based on the two methodologies. Under the current methodology, the total contribution of green interventions to CC for the 2023-2027 period amounts to EUR 77 billion compared to EUR 55 billion with the approach proposed under SQ9 (reduction of 29%).

This difference can be explained by the more granular approach developed under SQ9. For eco-schemes, EUR 29 billion (66% of eco-schemes) is allocated a 100% EU coefficient, and EUR 10 billion (22% of eco-schemes) have a 40% EU coefficient. The approach was applied to AECC, with 67% of green AECC (EUR 13 billion) having a 100% EU coefficient and 20% having a 40% EU coefficient (see section 4.9.2). This lowers the contribution of eco-schemes and AECC, which are the main contributors to CC.

Table 51 - Comparison of green interventions' contribution to climate based on current methodology and proposed approach (SQ9).

	Estimated budget based on current methodology (EUR million)	Estimated budget based on SQ9 approach (EUR million)	%change current methodologies and proposed approach (SQ9)
Eco-scheme	44 438	33 310	-25%
AECC	19 214	14 525	-24%
Green investments	11 049	6 294	-43%
Other green RD interventions	2 751	309	-89%
Sectoral interventions	0	850	
Total contribution to the objective	77 452	55 288	-29%

Source: Study team based on data from the Catalogue of CAP interventions

5.10.2.2. Biodiversity

The current tracking methodology for biodiversity relies on the application of EU coefficients and weights according to the link between interventions and SO6, as well as SO4 and SO5. Hence, the current methodology differentiates the weighting and coefficients according to the emphasis placed on the biodiversity objective (SO6) by MS. The methodology proposed under SQ9 provides greater granularity, with the analysis of interventions through the lens of FPs and PMEF indicators. To allocate an EU coefficient to an intervention, the proposed approach uses available scientific evidence regarding the expected impact of FP on biodiversity for eco-schemes, AECC and green investments. The proposed approach, therefore, uses an effect-based approach contrary to the current intent-based approach. The two methodologies are described in the following table.

Table 52 - Current tracking methodology for biodiversity and proposed approach (SQ9) for green interventions

	Current methodology	Proposed methodology (SQ9)
Eco-schemes	40% EU Coefficient with a 10% weight	100% EU Coefficient on interventions linked to FPs with a clear impact on the objective. 40% EU Coefficient on interventions linked to FPs with a moderate, or context-dependent impact on the objective.
AECC	1. 100% EU coefficient with: ▪ 100% weight if linked to SO6 only ▪ 70% weight if linked to SO6, and to SO4/SO5 ▪ 50% weight if linked to SO6 and other SOs 2. 40% EU coefficient if linked to SO4/SO5 but not to SO6	
Green investments		
Other green EAFRD interventions (except ANC)		100% EU Coefficient on interventions linked to R.19, R.24, R.29-R.35.
Sectoral interventions	NA	NA

Source: Study team based on the European Commission's Biodiversity tracking methodology[136] and SQ9

The following table presents the estimated budget for green interventions based on the two methodologies. Under the current methodology, the total contribution of green interventions to biodiversity for the 2023-2027 period amounts to EUR 47.39 billion, compared to EUR 60 billion under the proposed methodology (SQ9). This represents an increase of 27%. This increase can be explained by the greater budget allocated to eco-schemes and AECC under SQ9, which was estimated based on the expected contribution of FPs related to biodiversity.

[136] https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/biodiversity-mainstreaming_en#biodiversity-methodology

Table 53 - Comparison of green interventions' contribution to biodiversity based on the current methodology and proposed approach under SQ9

	Estimated budget based on current methodology (EUR million)	Estimated budget based on SQ9 approach (EUR million)	%change current methodologies and proposed approach (SQ9)
Eco-schemes	27 028	38 065	41%
AECC	13 497	16 645	23%
Investments	5 298	4 964	-6%
Other RD interventions (except ANC)	1 569	332	-79%
Green sectoral interventions	0	0	0%
Total	47 392	60 005	27%

Source: Study team based on data from the Catalogue of CAP interventions

5.10.2.3. Clean air

The current clean air tracking methodology and the proposed approach under SQ9 are summarised in the table below.

Table 54 - Current tracking methodology for clean air and proposed approach (SQ9) for green interventions

	Current methodology	Proposed methodology (SQ9)
Eco-schemes	Preselection of interventions linked to R.13, R.20. Allocation of 100%, 40% or 0% EU coefficient based on verification of contribution to clean air objectives by DG AGRI and DG ENV.	100% EU Coefficient on interventions linked to FPs with a clear impact on the objective.
AECC		
Green investments		40% EU Coefficient on interventions linked to FPs with a moderate, or context-dependent impact on the objective.
Other green EAFRD interventions (except ANC)		100% EU Coefficient on interventions linked to R.13, R.20
Sectoral interventions		NA

Source: Study team based on the Commission's clean air tracking methodology and SQ9

The current tracking methodology is the most approximate. It was developed and implemented to assess the contribution of the EAFRD (pillar 2) based on focus areas[137]. The methodology was updated for the 2023-2027 period to take

[137] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593765728744&uri=CELEX:52020DC0266

into account PMEF indicators directly related to clean air (R.13 on reducing emissions in the livestock sector, R.20 on improving air quality). The interventions linked to these results indicators were verified individually by DG AGRI and DG ENV to allocate EU coefficients at the intervention level. The current methodology uses an intent-based approach.

The approach proposed under SQ9 to analyse the contribution to clean air objectives provides a granular and systematic assessment through the analysis of FPs for eco-schemes, AECC and investments. It is an effect-based approach that uses the available scientific evidence. The FPs expected to contribute to clean air go beyond the reduction of ammonia emissions which were considered in the current methodology, this alternative methodology also considers NO emissions.

A detailed analysis of the interventions which were considered and verified under the current methodology highlights the difference in terms of granularity. Indeed, while interventions linked to R.13 and R.20 were verified individually under the current methodology, the contribution of eco-schemes, AECC and investments based on FPs was assessed at the UAC level.[138] As an example, the following table shows the difference in terms of allocation of the EU coefficient for the Flemish eco-scheme “cultivation of environmentally, biodiversity-friendly and/or climate resilient crops (eco-cropping)”.

[138] The impact of FPs on clean air is not yet well documented on the JRC FPEL. Hence, many FPs were not allocated a score for their contribution to clean air, which remains uncertain and likely underestimated. Only FPs for which robust scientific evidence was available were allocated a score.

Table 55. Comparison of EU coefficients allocated under SQ9 and under the current methodology to the Flemish eco-scheme "cultivation of environmentally, biodiversity-friendly and/or climate resilient crops (eco-cropping)"

UAC	Budget estimated based on unit amounts (EUR)	FPs	EU coefficient under SQ9	EU coefficient under current methodology
1.8.3.2	10 950 000	PX; ZX; P2X; Z1X; P21X; Z14	0	0%
1.8.1	3 338 400	RX; R1X; R12X; R121	0	
1.8.3.1	1 885 450	RX; ZX; R1X; Z1X; R12X; Z16	0	
1.8.3.3	1 617 000	ZX; FX; PX; SX; Z1X; F1X; P2X; S1X; Z16; F13; P23; S13	40%	
1.8.2.2	1 273 200	RX; ZX; FX; SX; R1X; Z1X; F4X; S2X; R13X; Z14; F44; S23X; R131	0	
1.8.2.1	339 480	RX; R1X; R12X	0	
1.8.4	307 800	RX; PX; SX; ZX; R1X; P2X; S2X; Z1X; R16; P23; R12X; S22; Z16	40%	

Source: Study team, based on SQ9 data and the mapping table of interventions used to estimate contributions to clean air under the current methodology

As shown in the table, two UACs are attributed a 40% EU coefficient under SQ9. This is because these UACs include the FP P23 on the limitation in timing and other limitations for plant protection products other than along water courses, which entails restrictions on the application of plant protection products. On the other hand, under the current methodology, the intervention as a whole is allocated a 0% EU coefficient, likely because the intervention mainly focuses on crops.

All in all, the methodology under SQ9 for eco-schemes, AECC and green investments provides more granularity and has the advantage of offering a systematic assessment based on FPs. On the other hand, the current methodology has the advantage of providing a very detailed assessment at the intervention level, but is likely more time-consuming to implement and has less granularity (assessment at the intervention level and not at the unit amount level).

For other EAFRD interventions (e.g. cooperation, training), the current methodology and the proposed methodology under SQ9 use a similar approach by considering interventions linked to R.13 and R.20, which directly address clean air objectives. Only two MS interventions are concerned, representing a very limited contribution. Clean air is currently not well captured by the PMEF result indicators, which only consider ammonia emissions. In addition, the focus of cooperation programmes on clean air is uncertain at the planning stage as they require the selection of specific projects, which are conducted throughout the programming period.

The following table presents the estimated budget for green interventions based on the two methodologies. Under the current methodology, the total contribution of green interventions to clean air for the 2023-2027 period amounts to EUR 1.9 billion, compared to EUR 22.13 billion under the proposed methodology (SQ9). This represents a significant increase, which can be explained by the consideration of other pollutants than ammonia (e.g. NO emissions) captured by FPs and the greater granularity of the analysis at the UAC level.

Table 56: Comparison of green interventions' contribution to clean air based on current methodology and proposed approach under SQ9

	Estimated budget based on current methodology (EUR million)	Estimated budget based on SQ9 approach (EUR million)
Eco-schemes	1 510	15 121
AECC	315	6 414
Investments		359
Other RD interventions (except ANC)	70	234
Green sectoral interventions		0
Total	1 895	22 128
Difference		1068%

Source: Study team

5.11. SQ11: To what extent could the current CAP tracking methodologies be improved to better fit their purposes?

SQ11: To what extent could the current CAP tracking methodologies be improved to better fit their purposes? 11.1: What are the main strengths and weaknesses of each of the current CAP tracking methodologies for climate, biodiversity and air quality respectively? 11.2 What are the feasible and proportionate (including in terms of administrative costs) alternative approaches that guarantee more reliable estimation for climate, biodiversity and air quality respectively? 11.3: How are these alternative approaches comparing with current methodologies in terms of strengths and weaknesses?

Key findings:

- The strength of the current methodologies lies in their practicality for annual implementation. However, significant limitations exist in terms of coherence across methodologies, granularity, use of scientific evidence, and potential overestimation (for climate) or underestimation (for biodiversity and clean air) of CAP contribution.
- The alternative approach adopts specific methodologies to estimate the contribution of each CAP intervention/instrument. It relies on scientific evidence (JRC FPEL, Evaluation Helpdesk studies) to estimate the concrete, expected impact of the main CAP interventions (DP, eco-schemes, ANC, AECC and green investments) on the three horizontal objectives, with greater granularity. In addition, it allows for an effect-based and coherent approach across the three horizontal objectives. All in all, this approach produces more reliable results and is more objective, although it has its limitations.
- While the granularity of the approach has increased, as well as the use of scientific evidence, the alternative approach remains reproducible. It involves more yearly calculations than the current method, but is entirely feasible at the EU level without the involvement of MS.
- The alternative approach can be improved in the future if more detailed data are available, for instance, additional data in the FPEL on the impact of FPs.

5.11.1. Methodological approach

This SQ is based on the outputs from the previous SQs:

- SQs 1 to 3 on the assessment of the past and present tracking methodologies, for the CAP and other funds, in order to identify strengths and weaknesses,
- SQs 5 to 8 on the contribution of DPs and ANC,
- SQs 9 and 10 on the contribution of green interventions.

5.11.2. Answer to the study question

5.11.2.1. What are the main strengths and weaknesses of each of the current CAP tracking methodologies for climate, biodiversity and air quality respectively?

Current tracking methodologies have evolved with the different programming periods, considering an evolving policy framework. This section presents the main strengths and weaknesses of the three current CAP tracking methodologies. These strengths and weaknesses are presented in the framework of budget tracking and consider the capacity to a) reproduce the methodology, b) the use of scientific evidence, c) the level of granularity, d) the coverage of different CAP interventions and e) the alignment with the methodologies implemented by other funds. They are presented for each horizontal objective individually i.e. climate, biodiversity and clean air.

Climate tracking is the methodology that is most grounded in the policy framework, with its specific budget tracking rules included in Article 100 of Regulation 2021/2115. It uses an effect-based approach that considers the main CAP interventions (direct payments, eco-schemes, AECC etc.). The current methodology is aligned with the methodology used for other EU funds and is easily reproducible at low administrative costs. Nonetheless, the current climate tracking has weaknesses. It lacks underpinning scientific evidence to justify the EU coefficients allocated to each intervention. The low granularity of the methodology entails that the diversity of MS interventions contributing to climate is not well-considered. In addition, it does not differentiate the specific contribution of the CAP to climate change mitigation and adaptation. The table below highlights the main strengths and weaknesses of the current climate tracking methodology.

Table 57 - Strengths and weaknesses of the current climate tracking methodology

Strength	Weakness
• Reproducible methodology each year (easy to implement). • Aligned with methods applied across EU climate-relevant funds (CPR, RRF, etc.), using standard EU climate coefficients for consistency and comparability. Fully integrated with CSP Regulation. • EU climate coefficients are assigned at the level of interventions. • Integrated across both CAP pillars (EAGF and EAFRD).	• No differentiation between CCA and CCM • Lack of scientific underpinning for many coefficients. • Assessment at the intervention level, with low granularity. • Depends heavily on MS design of interventions and how SO have been assigned to EAFRD interventions • Risk of overestimation for income support and ANC[139]

Source: Study team based on SQ2 and desk research

[139] The climate coefficients for income support (BISS, CRISS and CIS-YF) and ANC are set at 40% to reflect the contribution of conditionality. However, the contribution of conditionality is debated and the current allocation is not based on specific scientific evidence.

The following table details the strengths and weaknesses of the current biodiversity tracking methodology. The biodiversity tracking methodology evolved with the CSP Regulation to consider changes in the allocation of specific objectives by the MS and the changes from greening measures under 2014-2022 period to enhanced conditionality, eco-schemes and AECC. The methodology has the advantage of being easily reproducible at low cost, with a broad coverage of CAP interventions (DPs, eco-schemes, EAFRD). However, this methodology is not based on scientific evidence and relies heavily on how MS have allocated SOs to interventions in the CSPs, although they have clearly adopted heterogeneous approaches. The latter also reflects an intent-based approach, which translates into the budget estimated to contribute to biodiversity.

Table 58 - Strengths and weaknesses of the current biodiversity tracking methodology

Strength	Weakness
• Reproducible methodology each year (easy to implement), tailored to the CAP. • Specific methodology defined for biodiversity tracking (2023), applying EU coefficients notably according to the SO allocated to interventions. • Evolution of the biodiversity tracking methodology compared to the 2014-2020 period, taking into account changes in the CSP Regulation (allocation of SO, transition to enhanced conditionality and eco-schemes) • Supports CBD reporting and aligns with international obligations.	• Not based on scientific evidence. • Use of an intent-based approach using interventions' links to SOs and not an effect-based approach. • Not consistent with the tracking methodology on CC. • Complex methodology: EU coefficients are applied at the level of SO, with sub-weighting if SOs other than SO6 (biodiversity) is linked to the intervention. • Depends heavily on MS design of interventions i.e., in CSPs where interventions are linked to as many relevant SO as possible, the contribution may be underestimated compared to CSPs in which a conservative approach to the allocation of SO was adopted. • SO4 and SO5 are considered without focusing on result indicators that could specifically contribute to biodiversity i.e., R.19 and R.24.

Source: Study team based on SQ2 and desk research

The following table details the strengths and weaknesses of the current clean air tracking methodology. The clean air methodology considers the CAP interventions linked to PMEF result indicators R.13 and R.20, which mainly capture ammonia emissions. The interventions linked to these indicators and to additional PMEF result indicators were verified individually by DG AGRI and DG ENV to allocate EU coefficients (0%, 40% or 100%), as MS apply a heterogeneous approach for the application of PMEF result indicators. In addition, it does not consider other pollutants such as those emitted by pesticide and fertiliser use, meaning that the current methodology likely underestimates the contribution of the CAP to clean air. Finally, it relies heavily on PMEF result indicators allocated by the MS who followed heterogeneous approaches to link interventions.

Table 59 - Strengths and weaknesses of the current clean air tracking methodology

Strength	Weakness
• Supports reporting under the NEC Directive, aligning with existing legal obligations and improving accountability. • Specific clean air methodology developed by the Commission. • Use of a granular approach to assess the expected contribution of interventions linked to R.13 and R.20. • Linked to RI13 and R.20, this enables intent-based tracking for ammonia and GHG emissions. • Applies standardised EU coefficients (0/40/100%).	• Only covers interventions linked to R.13 and R.20, meaning that other pollutants (e.g. NO) are not considered. • Methodology involves the verification of each intervention to attribute EU coefficients. • Not harmonised with other tracking methodologies • Application depends on MS selection of relevant result indicators and on the information available in the CSPs to define the extent to which an intervention contributes to clean air in the cases where an intervention is linked to multiple result indicators

Source: Study team based on SQ2 and desk research

5.11.2.1. Sub-questions 11.2 and 11.3: What are the feasible and proportionate alternative approaches that guarantee more reliable estimation for climate, biodiversity and air quality? How are these alternative approaches comparing with current methodologies in terms of strengths and weaknesses?

The alternative approach adopts specific methodologies to estimate the contribution of each CAP intervention/instrument using the best information available. It relies on scientific evidence to estimate the concrete, expected impact of the main CAP interventions on the three horizontal objectives, with greater granularity. In addition, it allows for an effect-based and coherent approach across the three horizontal objectives. All in all, this approach produces more reliable results and is more objective, although it has its limitations. Finally, the approach is reproducible and can be further improved as outlined in this section.

Comparison of current and alternative approaches in terms of strengths and weaknesses

The alternative approach entails the following transversal improvements:

- To assess the contribution of direct payments and ANC, the team analysed 1) the contribution of each GAEC individually through a greater understanding of the FPs supported by each GAEC and how these FPs are expected to contribute to the three horizontal objectives; 2) the analysis of the positive farming systems towards the three horizontal objectives supported by the CAP using FADN data.
- To assess the contribution of eco-schemes, AECC and green investments, which are the main green interventions in financial terms, FPs supported by each intervention were analysed at the UAC level (section 5.9.1), and the expected impact of these FPs on the three horizontal objectives. This means that the analysis considers the different implementation modalities of interventions, thereby providing a granular analysis.
- Other green EAFRD interventions representing less than 4% of the green interventions, (cooperation, risk management, knowledge and ASD), as well as sectoral interventions, were analysed using PMEF result indicators and ring-fencing requirements. This approach is proportionate as 1) to get a greater understanding of the contribution of these other interventions, it would be necessary to analyse the specific projects supported by these interventions which would only be possible ex post, when projects have been selected and have demonstrable results; 2) these interventions are small in financial terms (less than 2% of the CAP budget). Efforts were therefore focused on interventions with greater financial impacts (income support, eco-schemes, AECC, ANC and green investments).
- The alternative approach adopts coherent methodologies across the three horizontal objectives. It is also coherent with methodologies used in other funds in terms of the use of EU coefficients and by only considering positive tracking.

The following tables show how the alternative approach responds to the weaknesses identified in the current methodologies, per horizontal objective.

Table 60- Weaknesses of the current methodology addressed by the alternative approach for climate change

Weaknesses of the current methodology	How it is addressed in the alternative approach
• No differentiation between CCA and CCM • Lack of scientific underpinning for many coefficients • Assessment at the intervention level, with low granularity • Depends heavily on MS design of interventions and how SO have been assigned to EAFRD interventions • Risk of overestimation for income support and ANC[140]	• Differentiation between CCA and CCM • Scientific evidence underpinning the contribution of direct payments, ANC, eco-schemes, AECC and green investments, based on the assessment of positive farming systems and FPs supported by these interventions. • Assessment at the level of FP / positive farming system supported by the interventions. • No longer relies on MS allocation to SO for the main EAFRD interventions (AECC and green investments). • Decreased risk of overestimation for income support and ANC, although one should be aware of the limitations of the methodology.

Source: Study team

[140] The climate coefficients for income support (BISS, CRISS and CIS-YF) and ANC are set at 40% to reflect the contribution of conditionality. However, the contribution of conditionality is debated and the current allocation is not based on specific scientific evidence.

Table 61 - Weaknesses of the current methodology addressed by the alternative approach for biodiversity

Weaknesses of the current methodology	How it is addressed in the alternative approach
• Not based on scientific evidence • Use of an intent-based approach using interventions' links to SOs and not an effect-based approach • Complex methodology: EU coefficients are applied at the level of SO with sub-weighting if more than SO6 (biodiversity) is considered in CSPs • Depends heavily on MS design of interventions i.e., in CSPs where interventions are linked to as many relevant SOs as possible, the contribution may be underestimated compared to CSPs in which a conservative approach to the allocation of SO was adopted • SO4 and SO5 are considered without focusing on result indicators that could specifically contribute to biodiversity i.e., R.19 and R.24.	• Scientific evidence underpinning the contribution of direct payments, ANC, eco-schemes, AECC and green investments, based on the assessment of positive farming systems and FPs supported by these interventions. • The assessment is based on the support for FPs and positive farming systems to focus on the effects of an intervention rather than on the global objectives pursued. • No longer relies on MS allocation to SO for eco-schemes and the main EAFRD interventions (AECC and green investments). • For the EAFRD interventions assessed through PMEF result indicators (cooperation, ASD, knowledge, risk management), the analysis considers R.19 and R.24.

Source: Study team

Table 62 - Weaknesses of the current methodology addressed by the alternative approach for clean air

Weaknesses of the current methodology	How it is addressed in the alternative approach
• Only covers interventions linked to R.13 and R.20, meaning that other pollutants (e.g. NO) are not considered • Methodology involves the verification of each intervention to attribute EU coefficients. • Not harmonised with other tracking methodologies • Application depends on MS selection of relevant Result Indicators and on the information available in the CSPs to define the extent to which an intervention contributes to clean air in the cases where an intervention is linked to multiple result indicators	• Consideration of air pollutants beyond ammonia such as NO emitted through pesticide use. • Adopts a systematic approach to estimate the contribution to clean air based on positive farming systems and FPs. • No longer relies on MS allocation to PMEF result indicators for eco-schemes and the main EAFRD interventions (AECC and green investments). • Considers the contribution of direct payments and ANC through conditionality and positive farming systems.

Source: Study team

Reproducibility of the alternative approach

Even though the granularity of the approach, as well as the use of scientific evidence has increased, the alternative approach remains reproducible. It involves more yearly calculations than the current method, but is entirely feasible at the EU level without the involvement of MS. This approach is linked to DG AGRI's work on the Agri-food data portal.

In order for DG AGRI to update the data provided in this report at lower costs, the following elements are suggested:

- The coefficients calculated for GAECs (taking into account the estimated net impacts in hectares and estimated DP budget (excl. eco-schemes)) may be used for the entire programming period (based on EU CAP Network report).
- Some analysis can be updated on a yearly basis:
    - on green interventions and eco-schemes (based on FP data and updated planned expenditures data at UAC level);
    - on the coverage of positive farming systems (based on FADN data).

Possible improvements:

This section presents the possible improvements that can be applied to the alternative approach, notably based on the potential availability of additional data.

1. Link between CAP interventions and FPs

FPs are linked to CAP intervention for eco-schemes, AECC and green investments in the Catalogue of CAP interventions and are based on the JRC classification of FPs. However, as mentioned in the limitations of the methodology, there is no full consistency in the granularity of these links across the CSP and interventions (at tier 1, 2 or 3 of the JRC classification). For the 2023-2027 CAP programming period, it is suggested to consider the information available at the most detailed tier, as is currently done in the proposed methodology, as the data has already been checked and is not expected to be subject to significant changes (link between interventions and FPs). For the next programming periods, ideally, the MS would use the classification of FP developed by JRC in the design of their CSPs, which would allow more consistency across CSPs.

2. Assessment of the impacts of FPs on climate, biodiversity and clean air

The assessment of each FP on climate, biodiversity and clean air is mainly based on the recent database elaborated by JRC FPEL (see section 3.2.2).

At present, it provides synthesis of scientific meta-analysis. Some improvements are planned to be provided with the quantitative assessment of the impact of the different FPs.

A strong limitation remains in the causality link between an intervention and the implementation of a specific FP. There may be some deadweight effects which are difficult to estimate in the context of this study. Net impacts have been assessed when possible, with available literature and conservative assessments in order to avoid these deadweight effects in the calculation. Budget tracking methodologies may be improved on a regular basis taking stock of the results of new research or evaluations on the impacts of CAP intervention on the environment and climate.

In addition, at present, all FPs identified in CSP are not integrated into the JRC FPEL.

In the present study, the scale used for assessing FPs is on three levels: 0, 1, 2 (which is coherent with EU markers 0%/40%/100%). In many cases, the assessment was considered “context dependent” and scored 1. If more detailed data were available, a score of 2 could be used in the context where the FP is expected to have higher impacts (in terms of MS, type of farming, type of area).

Thus, the assessment of FPs could still be improved in the future using:

- a higher precision of the FPs covered by each CAP intervention, through a more homogeneous identification of FPs for each CAP intervention in the CSPs and a reporting of this information in the Agri-food data portal;
- a higher precision in the assessment of the contribution of each FP, updating the assessment when new information is made available in the JRC FPEL. This may be conducted on a yearly basis or every 2-3 years, depending on the resources allocated to this task.

3. Assessment of the importance of positive farming systems and the CAP payment received by the farms involved in these systems

The assessment of positive farming systems plays a major role in the weightings of DPs. Thus, it is of high interest to still improve the granularity and robustness of the analysis.

Such improvements could be reached through:

- a more granular approach of the impacts of the systems in the different EU contexts (the present analysis tended to an intermediate scoring in several cases, due to “context-dependent” contributions);
- the use of an additional weighting to provide more balanced results (in relation to a more granular approach provided above). For instance, an additional weighting of 100% in the context where the farming system is identified to have a positive impact, 40% when it is identified to have a limited impact or 0% when no impact is expected. If more detailed information is available on the impact of each farming system, more detailed weighting may be used (20%, 70%, etc.).

4. Possible use of data from annual performance reports (APRs) and DIBs

MS provide APR on a yearly basis. These data could be used to overcome possible gaps in the Agri-food data portal.

DIB is detailed in Articles 9 and 10 of Commission Implementing Regulation (EU) 2022/1475. It aims at gathering detailed information on CAP payment at the beneficiary level. MS shall deliver these disaggregated data on a regular basis.

DIB could be a relevant source to improve the granularity of budget tracking. This could, for instance, allow a higher precision of the analysis conducted through FADN in the context of this study (for the assessment on “positive farming systems” with regard to GAECs) or, if relevant, provide more granular data than what is currently available in the Agri-food data portal. However, this system is being implemented while this study is conducted, and there was no information available on the level of quality and completeness of the data transmitted by MS. Thus, no conclusions could be drawn on the possible use of DIB in the context of budget tracking.

6. Conclusions

Based on the analyses conducted in the framework of this study, the following conclusions are made.

Value added of the alternative approach based on the impacts of farming practices and "positive farming systems"

An alternative approach for budget tracking, based on FPs and contribution to "positive farming systems" to CC, biodiversity and clean air is feasible and provides assessment with high granularity and use of scientific evidence. The consideration of the contribution of DPs and ANC in the support of "positive farming system" is coherent with a result-based approach for budget tracking (compared to an intent-based approach).

This alternative approach is possible thanks to recent improvements of the CAP monitoring tools: Agri-food data portal, classification of CSPs' FPs by the JRC, the JRC FPEL evaluating the impact of each FP on CCA, CCM, biodiversity and clean air and the European Evaluation Helpdesk study on the "Rough estimate of the climate change mitigation potential of the CAP Strategic Plans". In addition, FADN individual data have been used to assess the magnitude of some specific farming systems.

The application of this result-based approach means that the contribution of the CAP interventions has been assessed in relation to the FPs linked and not in relation to the objectives set for each specific intervention. This is a strong shift compared to some current methodologies for budget tracking, where only the interventions related to a specific SO were counted.

The alternative approach is more reliable, based on scientific evidence.

Possible further improvements of the methodology in the future with new data

The level of information available from the different sources is evolving constantly. Any update or improvement from these sources may allow for an improvement of the alternative methodology for budget tracking.

For instance:

- The alternative methodology is extensively based on the FPEL (JRC). Thus, any update or improvement of this tool could allow for an increase in the granularity and robustness of the tracking.
- Data on agricultural areas in wetlands and peatlands should be available in the coming years, which could allow to fill in some gaps in the analysis of GAECs.
- The link between FPs and CAP intervention is not homogeneous among CSPs (this information is disseminated in the Agri-food data portal); any improvement in this reporting may allow an improvement in the tracking. From a methodological point of view, the identification of FPs at the Tier 2 level (from JRC classification) is satisfactory in the context of this alternative approach. In addition, the principles of budget tracking based on FPs could be shared with MS. This would increase their awareness of the impact of the CSP design on the environment and climate. This could encourage MS to provide more granular information on interventions.

As the support of “positive farming systems” through DPs and ANC accounts for a large share of the positive contribution of the CAP to climate, biodiversity and clean air, specific attention should be given to these analyses. Thus, budget tracking would benefit from taking into account possible new research (academic, evaluation studies) on:

- the role of DPs and ANC in the implementation of the different positive systems, to provide a more balanced and robust analysis;
- the possibility of land abandonment as a counterfactual of ANC in some areas.

Comparability between the current and the alternative methodologies

The current methodologies employ different approaches for each of the three horizontal objectives (climate, biodiversity and clean air), while the alternative approach proposes a harmonised method for all these horizontal objectives. The new approach does, however, lead to important discontinuity with the budget tracking provided by the current methodologies (in particular for clean air). If this alternative approach is adopted, the change in methodology should be clearly highlighted in order to avoid any misunderstanding in the evolution of the data.

Feasible update of the assessments and calculations used in the alternative methodology

The alternative methodology is based on a set of assessments and calculations which are feasible. The frequency of updates may be different for each of them, depending on the availability of data and the effort needed to conduct the updates. In more detail:

- the update of the budget allocated to each CAP intervention could be conducted on a yearly basis;
- FADN analysis may be updated every year or every 2-3 years, depending on the resources allocated to this task (these analyses are used to assess the importance of the positive farming systems);
- The link between FPs and CAP interventions used in the present study may be used for the whole programming period (unless there are changes in the CAP interventions in CSPs);
- the use of some coefficients calculated in the present study may be used for the whole programming period (for instance, the impact of GAECs);
- the assessment of the contribution of each intervention or FP to the environment and climate may be updated when new information is available (JRC FPEL, evaluation study on a specific CAP intervention…).

7. Bibliography

Andrés, P., E. Doblas-Miranda, P. Rovira, A. Bonmatí, A. Ribas, S. Mattana, and J. Romanyà, 'Research for AGRI Committee: Agricultural Potential in Carbon Sequestration', European Parliament, Policy Department for Structural and Cohesion Policies, Brussels., 2022.

Angileri, V., I. Guerrero, and F. Weiss, 'A Classification Scheme Based on Farming Practices', JRC Publications Repository, 2024. https://publications.jrc.ec.europa.eu/repository/handle/JRC133862.

EEA, 'Annual European Union Greenhouse Gas Inventory 1990-2021 and Inventory Report 2023', April 18, 2023. https://www.eea.europa.eu/en/analysis/publications/annual-european-union-greenhouse-gas-2.

EMEP/EEA, 'EMEP/EEA Air Pollutant Emission Inventory Guidebook 2023', October 2, 2023. https://www.eea.europa.eu/en/analysis/publications/emep-eea-guidebook-2023.

EU CAP Network, Rough Estimate of the Climate Change Mitigation Potential of the CAP Strategic Plans (EU-18) over the 2023-2027 Period, 2024.

EU Commission, 'Commission Notice on the InvestEU Programme Climate and Environmental Tracking Guidance', June 5, 2021.

'EU Action on Biodiversity Financing | Knowledge for Policy', n.d. https://knowledge4policy.ec.europa.eu/biodiversity/eu-action-biodiversity-financing_en.

European Commission, 'Biodiversity Mainstreaming - European Commission', Biodiversity Mainstreaming, 2025. https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/biodiversity-mainstreaming_en.

Biodiversity Tracking Methodology for Each Programme 2021-2027, 2023.

'Clean Air Methodology', June 24, 2024.

'Clean-Air Tracking - European Commission', Clean-Air Tracking, 2025. https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/horizontal-priorities/green-budgeting/clean-air-tracking_en.

Climate Mainstreaming Architecture in the 2021-2027 Multiannual Financial Framework, 2022.

COMMISSION DELEGATED REGULATION (EU) 2021/2139, 4.6.2021.

‘Commission Notice – Technical Guidance on the Application of Do No Significant Harm under the Recovery and Resilience Facility Regulation’, Official Journal of the European Union, March 24, 2023.

European Commission., ‘Commission Notice — Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027’, Official Journal C 373, September 16, 2021.

European Commission, ‘Common Agricultural Policy - Performance - European Commission’, Common Agricultural Policy - Performance, 2025. https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/programme-performance-statements/common-agricultural-policy-performance_en.

‘COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the Performance Framework for the EU Budget under the 2021-2027 MFF’, 2021.

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the Progress Made on the Implementation of Directive (EU) 2016/2284 on the Reduction of National Emissions of Certain Atmospheric Pollutants, COM(2020) 266 Final, 26.6.2020.

European Commission. Directorate General for Agriculture and Rural Development. and Alliance Environnement., Evaluation Study of the Impact of the CAP on Climate Change and Greenhouse Gas Emissions: Final Report., Publications Office, LU, 2019.

European Commission. Directorate General for Agriculture and Rural Development., ECORYS., METIS., and Agrosynergy., Mapping and Analysis of CAP Strategic Plans: Assessment of Joint Efforts for 2023 2027., Publications Office, LU, 2023.

European Commission: Directorate-General for Environment, IEEP, Trinomics, M. Nesbit, K. Whiteoak, E. Underwood, M. Rayment, et al., Biodiversity Financing and Tracking: Final Report, Publications Office of the European Union, 2022.

European Commission. Joint Research Centre., The JRC Farming Practices Evidence Library: This Library Synthesizes a Large Amount of Scientific Evidence to Assess the Effects of Farming Practices on Sustainability Outcomes, Mainly Regarding the Environment, the Climate, and Agricultural Productivity., Publications Office, LU, 2025.

EUROPEAN COMMISSION–Directorate-General for Agriculture and Rural Development –UnitA.3, ‘Assessment of Sectoral Support within the CAP’, 2025.

European Court of Auditors, Biodiversity on Farmland: CAP Contribution Has Not Halted the Decline, May 6, 2020.

EU Greenhouse Gas Emissions : Well Reported, but Better Insight Needed into Future Reductions, Special Report No ... (European Court of Auditors. Online), Publications Office, LU, 2019.

Joint Research Centre, Schievano, A., Bosco, S., Terres, J.-M., Perez-Soba, M., Montero Castaño, A., Catarino, R., Chen, M., Guerrero, I., Tam-burini, G., Mantegazza, O., Landoni, B., Bielza, M., Rega, C., Weiss, F., Assouline, M., Castro Malet, J., Pasqualini, V. and Makowski, D., The JRC farming practices evidence library, Publications Office of the European Union, Luxembourg, 2025, doi:10.2760/9473570, JRC141584

Special Report 09/2022 - Climate Spending in the 2014-2020 EU Budget - Not as High as Reported, Publications Office, LU, 2022.

'Special Report 16/2021: Common Agricultural Policy and Climate: Half of EU Climate Spending but Farm Emissions Are Not Decreasing', June 11, 2021.

European Parliament, Biodiversity Mainstreaming in the EU Budget Excerpts from Commission's Documents on the Draft Budget 2023, 2023.

European Parliament and Council of the European Union, Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the Reduction of National Emissions of Certain Atmospheric Pollutants, Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC (Text with EEA Relevance), OJ L, 14.12.2016.

Regulation - 2021/523 - Establishing the InvestEU Programme and Amending Regulation (EU) 2015/1017, 24.3.2021.

Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 Establishing Rules on Support for Strategic Plans to Be Drawn up by Member States under the Common Agricultural Policy (CAP Strategic Plans) and Financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and Repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013, 2.12.2021.

Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on Nature Restoration and Amending Regulation (EU) 2022/869 (Text with EEA Relevance), 24.6.2024.

Levarlet, F., M. Alessandrini, M. Schratzenstaller-Altzinger, and N. Franceschelli, 'Climate Mainstreaming in the EU Budget: 2022 Update', 2022.

Münch, A., M. Badouix, H. Gorny, I. Messinger, B. Schuh, M. Beck, S. Bodart, and P. Van Bunnen, 'Comparative Analysis of the CAP Strategic Plans and

Their Effective Contribution to the Achievement of the EU Objectives', Policy Department for Structural and Cohesion Policies, 2023.

Nesbit, M., T. Stainforth, K. Hart, E. Underwood, and G. Becerra, 'Documenting Climate Mainstreaming in the EU Budget; Making the System More Transparent, Stringent and Comprehensive', 2020.

Nesbit, M., K. Whiteoak, M. Rayment, K. Hart, G. Aubert, E. Kollenda, A. Lóránt, et al., Biodiversity Financing and Tracking: Final Report, Publications Office of the European Union, 2022.

Schievano, A., S. Bosco, M. Perez-Soba, R. Catarino, C.A. Montero, M. Chen, G. Tamburini, et al., 'Umbrella-Review of Meta-Analyses: A Methodological Framework to Support Evidence-Based Policymaking', JRC Publications Repository, 2025. https://publications.jrc.ec.europa.eu/repository/handle/JRC139857.

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KF-01-25-017-EN-N

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