# IMPACT AND OPPORTUNITIES OF THE 2023-27 CAP REFORM IN DENMARK

CONCITO

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Report

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## Content

## Abbreviations

AgETS - Agricultural Emissions Trading System

CAP - Common Agricultural Policy

CBAM - Carbon Border Adjustment Mechanism

CC - Cross Compliance

CO2 - Carbon Dioxide

CO2e - Carbon Dioxide equivalent

COM - Commission (EU Commission)

CSP - CAP Strategic Plans

DAA - Danish Agricultural Agency

DKK - Danish Crown

EAGF - European Agricultural Guarantee Fund

EAFRD - European Agricultural Fund for Rural Development

EEB - European Environmental Bureau

EU - European Union

EUR - Euro

F2F - Farm to Fork Strategy

GAEC - Good Agricultural and Environmental Conditions

GHG - Greenhouse Gas

Ha - Hectare

IEEP - Institute for European Environmental Policy

LULUCF - Land-Use, Land-Use Change and Forestry

MRV - Monitoring Reporting and Verification

MS - Member States

MFF - Multiannual financial Framework

N - Nitrogen

NDM - New Delivery Model

P - Phosphorus

PMEF - Performance Monitoring and Evaluation Framework

RED - Renewable Energy Directive

SDG - Sustainable Development Goals

SMRs - Statutory Management Requirements

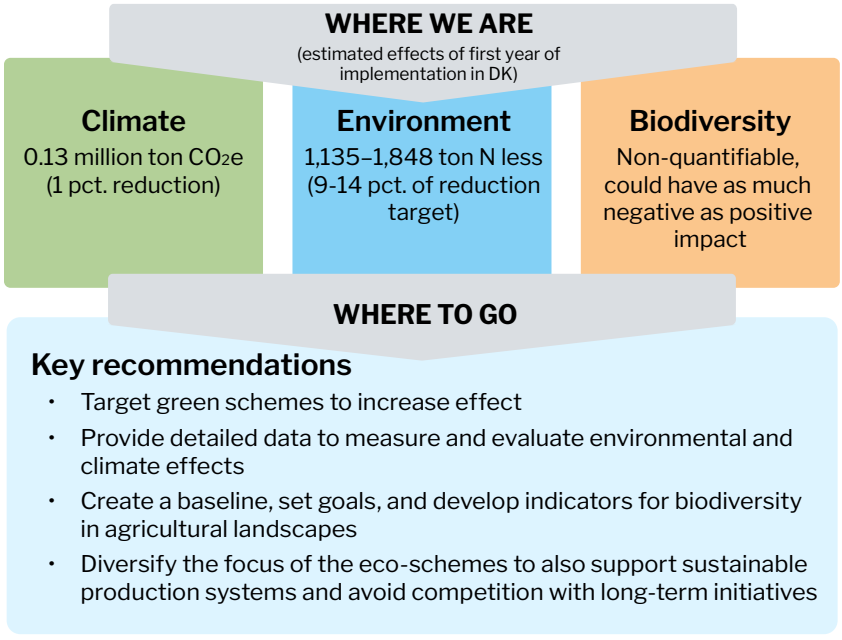
# 1. Executive Summary and Recommendations

In this report, CONCITO analyses the implementation of the 2023-27 Common Agricultural Policy (CAP) reform after its first year of implementation, using Denmark as a case study. The focus lies on examining the new components of the reform, namely the New Delivery Model (NDM), the enhanced conditionality, and the eco-schemes, and their contribution towards both the European Union (EU) and national objectives concerning climate, biodiversity, and the environment. Additionally, the report examines economic developments within Denmark's agricultural sector in 2023 and offers insights into potential future agricultural policies in the EU. The report aims to provide a near-real-time impact evaluation of some of the most crucial greening measures and assesses their effectiveness. It does not cover the rural area development program, as the expected impacts of these funds are long-term and therefore have not yet occurred.

**Minimal effects from new green elements**

The primary impacts of implementing the new CAP on climate, biodiversity, and the environment in Denmark in the first year have largely resulted from land set-asides incorporated in short-term commitments. On a positive note, this has allocated more land for non-productive elements in the agricultural landscape, which has slightly reduced greenhouse gas (GHG) emissions, nitrogen leaching and provided more support for generalist species in the farmland like ladybird beetle, common carabid, spiders and hare. However, as this report shows, there are significant insufficiencies both in the EU CAP framework, but especially also in the way the Danish CAP Strategic Plan (Danish CSP) has been implemented.

One of the main conclusions is that the enhanced conditionality has not introduced many new green requirements, thereby having a limited additional effect. Moreover, the implementation of the sole conditionality, also known as Good Agricultural and Environmental Conditions (GAEC) number 8, which requires allocating 4% of agricultural land to 'non-productive areas,' has been somewhat counterproductive. This is because it has inadvertently encouraged the clearing of semi-natural areas in some areas.



Another key finding is the low uptake of eco-schemes, with only approximately 60 pct. of the budget utilised. Moreover, the most popular eco-schemes exhibited low additionality, largly functioning as compensatory measures to mitigate the economic impact of the reform on certain sectors, rather than as incentives to provide environmental benefits. Therefore, a significant portion of the funds allocated for eco-schemes in Denmark has not been used for intended climate or environmental purposes. CONCITO estimates that approximately 37 EUR million subsidised existing operations without fostering new advancements or enhancements in environmental management. This corresponds to 57 pct. of the total applied eco-scheme funds.

In this report, the following 'green' effects of the Good Agricultural and Environmental Conditions (GAECs) and eco-schemes are estimated:

- A climate effect of 0.13 million tonnes $CO_2e$, corresponding to a 1 pct.[1] reduction of the total Greenhouse Gas (GHG) emission from the Danish agricultural sector.
- A reduction in nitrogen (N) leaching to the aquatic environment of 1,135–1,848 tonnes N, corresponding to 2 - 3 pct. reduction of the total N-leaching from land to sea in Denmark and 9 - 14 pct. of the 13,000 tonnes N reduction goal by 2027 stated in the Water Framework Directive.
- Short-term biodiversity measures were incentivised, which can have as much negative as positive impact on organisms in the agricultural landscape. The target of the EU Biodiversity Strategy is to reach at least 10 pct. high-diversity landscape features on agricultural land by 2030 in the EU.

Therefore, the overall green effect is minimal, and several of the green measures are also competing against each other.

**Simplification of the CAP**

While Denmark, as one of the few Member States, implemented all the GAECs and eco-schemes, the report shows an overall improvement of the Danish agricultural sectors' economy in 2023. This improvement can be attributed to reduced debt for the agricultural sector, increased prices of agricultural land, and high crop prices.

Starting from 2025, the CAP will undergo another change following the European Commission's sudden proposal to increase 'flexibility'. This proposal will, among other things, greatly reduce the requirements of GAEC 8 to accommodate farmers' concerns and demands following the protests in 2023-24. However, the example from Denmark shows that implementing enhanced conditionality (GAEC 8) can coincide with improvements in the agricultural economy, which raises questions about the need to remove the enhanced GAEC 8.

**Danish implementation of the CAP has limited effect**

The implementation of the new CAP in Denmark has revealed a deficiency in providing effective tools, establishing measurable goals, and implementing appropriate regulations to yield additional environmental benefits. While the New Delivery Model (NDM) sets a minimum level of ambition at the EU level through conditionalities, these conditionalities have not resulted in significant additional environmental effects in Denmark.

1 As a total the entire sector's GHG emissions, including LULUCF, husbandry, manure management and application as well as fisheries and the energy use of the sector.

All the Danish eco-schemes are currently designed as annual schemes. However, many of the desired goals of these schemes require persistent changes in agricultural practices and land use. Therefore, the annual approach lacks the potential to significantly facilitate lasting environmental impacts and does not support farmers to make long-term investments in more sustainable production systems.

**The EU CAP framework does not ensure the environmental impact of the new CAP**

The performance monitoring and evaluation framework (PMEF) primarily focuses on process-oriented evaluations and, as a result, does not provide quantitative estimates of the impacts of measures implemented by Member States in the CAP Strategic Plans (CSPs). This shortfall hinders the accurate assessment of the quality of the CSPs before the ex-post evaluation scheduled for 2031. This presents a significant problem as it allows for an extended period of undetected inefficiency, unaddressed environmental impacts, and misallocation of resources.

Moreover, the governance framework in the NDM may inadvertently incentivize setting low ambitions to avoid missing targets and to ensure a high uptake of the schemes in order to distribute funds to farmers and prevent budgetary losses. While the EU Commission is working to develop relevant methodologies for estimating the climate impacts of CSP measures, further work is critically needed to facilitate the quantification of the impacts of CSP measures in order to allow for more responsive policy adjustments within the current CAP cycle.

**Need for new innovative solutions**

This report highlights persistent structural issues within the CAP itself, including inadequate environmental ambition, implementation complexity, as well as conflicting interests and competing objectives; all of which further hinder the policy's effectiveness. Hence, there is a demand for innovative solutions within EU policies addressing the agricultural sector, both within and beyond the scope of the CAP.

A more comprehensive and effective **policy mix for EU agriculture** is essential to tackle the multitude of challenges facing the agricultural sector. This proposed policy mix could encompass **substantial reforms within the CAP,** including phase out of direct payments, the implementation of an **agricultural Emissions Trading System (AgETS)**, and the establishment of a new **Sustainable Land Management and Fair Transition Fund**, among other measures. It is crucial that these changes are pursued simultaneously and in a coordinated manner to prevent conflicting policy signals, such as both pricing GHG emissions and subsidising emissions-intensive agriculture.

The potential enlargement of the EU to include Ukraine could be a 'shock' to serve as a catalyst for reconfiguring the CAP, creating a window of opportunity where the proposed changes become politically viable. This 'shock' to the CAP could thus provide the necessary momentum for implementing a CAP reform aligned with broader sustainability and environmental goals.

To enhance the effectiveness of the new CAP framework, **CONCITO recommends strengthening the conditionality, promoting knowledge exchange among member states, and implementing impact-oriented monitoring and evaluation systems for CAP implementation at the EU leve**l.

Additionally, to amplify the effect on climate, biodiversity, and environmental objectives of the eco-schemes, **CONCITO recommends strengthening the design requirements of the schemes**. Specifically, implementing an 'above-the-baseline-point-system' in each Member State. This system should define explicit targets for each eco-scheme that surpass the national baseline, including conditionality, in quantifiable terms. This should ensure that eco-schemes not only provide tangible environmental improvements but also avoid merely compensating certain agricultural sectors for the economic impacts of the CAP reform.

Furthermore, CONCITO has the following concrete recommendations based the Danish implementation of the eco-schemes:

- **Diversify the focus** of eco-schemes in Denmark to prioritise more support for sustainable production systems, rather than solely focusing on setting aside agricultural land. Additionally, ensure that eco-schemes are designed in a way that they do **not compete with long-term schemes.**
- The Danish Government should provide more detailed **data on the effect** of the different measures to reduce nitrogen leaching to the aquatic environment.
- Establishing a **baseline, goals and monitorable indicators for biodiversity** in the agricultural landscape, which can be used by farmers and consultants.
- Eco-schemes should be **targeted and regionalized** based on the specific objectives of each scheme to enhance their impact and effectiveness. For instance, linking the biodiversity scheme to a High Nature Value map.

For each eco-scheme, CONCITO recommends:

- The eco-scheme **'Diversified plant production'** is split into two eco-schemes respectively: **one for plant-based foods** and **one for diversified plant production**, thereby avoiding any counterproductive restrictions.
- The **'Climate- and Environmentally Friendly Grassland'** eco-scheme specifically should **target areas** with a need for nitrogen leaching reductions, such as coastal catchments or environmentally sensitive zones as well as integrate a system that considers **both the duration** that land has been maintained as grassland and **the proportion of grassland** within the crop rotation.
- The eco-scheme **'Biodiversity and sustainability'** is modified to be a **multi-annual scheme** which prioritises protection of existing biotopes and encourages long-term conservation efforts for both new and existing habitats.

Overall, after the first year of implementing the new CAP, the agricultural sector has yet to make a significant contribution toward aligning with the EU's climate targets, biodiversity objectives, and environmental goals. Therefore, it is imperative to prioritise a **broader policy mix for EU agriculture** in the upcoming negotiations of the next Multiannual Financial Framework (MFF) by the EU Commission. This policy mix should address the wide scope of challenges within the agricultural sector and should be designed to **enhance environmental integrity, effectiveness, and social equity of policy interventions** by strategically integrating various policy tools.

# 2. Introduction

The Common Agricultural Policy (CAP) of the EU has undergone extensive changes over the last four decades, evolving from a policy primarily aimed at increasing agricultural productivity and income support to one that encompasses a broader range of objectives including environmental protection, social equity, and rural development. The 2023-27 reform aims to address these issues through a more dynamic and responsive policy framework that better aligns agricultural practices with EU-wide environmental and climate goals.

This report examines the most recent CAP reform 2023-27 (new CAP), with a particular focus on its implementation in Denmark and the integration of new elements including the New Delivery Model (NDM), the Good Agricultural and Environmental Conditions (GAECs, referred to as 'conditionalities'), and the eco-schemes. Furthermore, the report also provides reflections on the economy of the agricultural sector in Denmark as well as perspectives on future EU agricultural policies.

**The previous CAP did not sufficiently deliver on climate and biodiversity**

While the CAP is a critical tool for meeting climate and biodiversity goals within the agricultural sector, evaluations from entities such as the European Court of Auditors and the European Commission did not significantly advance the political objectives related to climate or biodiversity. Greenhouse gas (GHG) emissions from the agricultural sector have stagnated since 2010, and the biodiversity on farmland has not improved. This is despite the fact that 66 billion EUR of the CAP budget was in principle earmarked for biodiversity and 100 billion EUR for climate in the previous CAP period. While it is important to acknowledge that 'green' CAP interventions may have helped stabilise greenhouse gas emissions and biodiversity levels by preventing more significant declines, it is also worth considering that CAP's per hectare support incentivizes agricultural production on marginal lands. This often leads to less efficient agricultural practices in areas that would be more suitable for natural landscapes.

**Elements of the new CAP**

Eco-schemes are new instruments in the CAP intended to support farmers to increase environmental and climate action via funds in pillar I[2]. Furthermore, nine enhanced conditionalities set out requirements which farmers must live up to in order to receive their full direct income support from the CAP.

On the 15th of March the EU Commission proposed to 'ease administrative burden' for EU farmers. These changes included the removal of the enhanced conditionality number 8 and made several of the other conditionalities more flexible. GAEC 8 will solely continue to be a requirement for the protection of historic sites in the landscape. An eco-scheme, which farmers can apply for on a voluntary basis, will replace the enhanced GAEC 8. The reduced ambition of the GAECs may consequently lower the ambition of the eco-schemes. Member States can now set the ambition of these schemes to just slightly above the diminished levels of the GAECs.

2 The CAP is divided into two pillars which serve different functions. Pillar I provides direct income support to farmers and regulates the market through the common market organisation to counter-balance price volatility in agricultural markets in the EU. Pillar II provides funding for rural development, including environmental schemes, and is thereby also an element of the CAP green architecture, however not a new element.

The Danish Government is still obligated to deliver on the estimated effects of the enhanced GAEC 8 with the projected reducing GHG emissions and nitrogen leaching in Denmark, as stipulated by the broad political agreement on agriculture in 2021, which provides the political approval of the Danish CSP. The signatory parties to the Danish agricultural agreement included eleven political parties, reducing the chances of backsliding from the original deal.

Denmark, along with Malta, was among the first EU countries to fully implement GAECs without derogations in 2023. Derogations related to fallow land first came about in 2022 due to the Russian invasion of Ukraine. The full implementation of all the GAECs in Denmark could also be attributed to the broad political agreement on agriculture in 2021, since some of the parties would not permit any derogations.

**Pillar II can provide increased impact**

Pillar II of the CAP is the EU's designated rural development program, intended to support economic, environmental and social development to the rural areas of the EU. Compared to pillar I, the flexibility offers Member States the possibility to draft individual multiannual rural development programs based on requirements named 'menu of measures' by the EU commission, requiring Member States to include measures such restoring agricultural production damaged by natural disasters, transfer of knowledge, animal welfare, Nature 2000 and Water Framework Directive. Unlike pillar I, pillar II is financed through both EU, regional and national funds. There have been changes to pillar II in comparison to the previous reform, with a focus on enhancing flexibility and specificity of support to effectively address diverse local needs. The current CAP reform places a stronger emphasis on integrating environmental and climate objectives. Pillar II, dedicated to rural development, now features increased co-financing rates and aligns more closely with broader EU strategies, such as the European Green Deal.

Denmark is utilising the pillar II funding towards the five following schemes: (1) the establishment of green biorefining facilities, (2) start-up aid for young farmers, (3) afforestation on private land, (4) establishment of small wetlands to reduce N and P leaching and (5) clearing of areas to sustain open areas with grazing husbandry. Pillar II measures are not assessed in this report as a comprehensive and meaningful evaluation of pillar II's effectiveness would require a longer timeline to accurately capture the impact of its various initiatives.

**Big environmental challenges related to the agricultural sector in Denmark**

In Denmark, there are profound challenges to overcome in order to reach climate and biodiversity goals. GHG-emissions from agriculture[3] are high and currently make up 30 pct. of all national emissions and the share is projected to increase to 49 pct. by 2035. This equals a 43 pct. reduction compared to 1990 levels. The broad political agreement on agriculture in 2021 sets a binding reduction target for greenhouse gas emissions from the land and forestry sectors of 55-65 pct. by 2030 compared to emissions in 1990.

Biodiversity is in continued decline in Denmark and only 1.6 pct. of the land areas are protected.

3 Containing GHG emissions from LULUCF, animal husbandry, manure management and application, as well as fisheries and the energy use of the sector.

There have been significant improvements in regards to reducing nitrogen and phosphorus leaching, but there are still substantial challenges of eutrophication and oxygen depletion in Danish surface waters, as reported through ongoing monitoring. Through the water framework directive, Denmark has committed to reducing the inputs of nitrogen (N) to the aquatic environment with just over 13,000 tonnes approx. by 2027.

In 2021, the normalised leaching of nitrogen to the aquatic environment was 55.000 tonnes N according to national monitoring and in 2027 the goal is a maximum leaching of 42.000 tonnes N to the aquatic environment from agriculture.

The purpose of this report is to conduct an impact evaluation of the GAECs and eco-schemes in Denmark after their first year of implementation. It aims to share insights both from Denmark's CAP implementation with other EU Member States as well as highlighting shortcomings in the EU CAP framework. The methodology of this study is based on the uptake data for the GAECs and eco-schemes in Denmark from 2023, along with the emissions and leaching factors developed by Aarhus University most of which is detailed in the Danish CSP.

This analysis aims to identify challenges, propose potential solutions, and offer recommendations for policy improvements at both the national and EU levels.

# 3. The New Delivery Model

During the latest CAP period (from 2014-20) an extensive revision and public consultation of the CAP was undertaken, reflecting a wish to modernise and simplify the CAP amongst the recipients. An opinion paper submitted by the Danish Business Forum, but widely supported by stakeholder throughout the Member States called for a streamlining of the CAP, particularly regarding the cross compliance (CC) within the CAP. Resulting in the scope of cross compliance being simplified into one single list including all Statutory Management Requirements (SMRs) and Good Agricultural Environmental Condition (GAECs) standards. Moreover, the number of SMRs was reduced from 18 to 13, clearing out cases where there are no clear and controllable obligations for farmers.

The framework of CC within the last reform period provided Member States with a broad explanation on how to administer CC, resulting in localised interpretation of eligibility and penalties for malpractice.In the European Commission's communication regarding the latest CAP period (2014-20), it was concluded that direct payments needed to be redistributed to address the issue of a minority of farmers receiving the majority of payments. Additionally, the redistribution aimed to increase the proportion of EU farmland under environmentally beneficial practices. However, the communication did not provide specifics on how these environmental benefits should be achieved.

**High flexibility of the Member States**

With the New Delivery Model (NDM), Member States must design their own CAP Strategic Plans (CSPs). These are policy plans for the entire CAP period that must be designed based on accurate assessment of challenges observed in each individual Member State, as well as main requirements for developing the CAP Strategic Plans. In this way, Member States can shape performance-oriented measures to address their specific needs, as well as the strengths, weaknesses, opportunities, and threats identified through a mandatory SWOT-analysis, within a simplified, but still common EU framework of e.g. common requirements, objectives and indicators, and common list of broad types of interventions.

The EU legislation lays down procedural requirements for submission, assessment and approval of CSPs, including specific time limits of the new CAP. Figure 1 shows an example of a SWOT-analysis from the Danish CSP. The SWOT-analysis should take into account national strategies to address challenges in the agricultural sector. The objective of the SWOT-analysis is to comprehensively address disadvantages, and vulnerabilities in each Member State in a tailored fashion and create the foundation for the national CSP.

**EU CAP framework sets the lowest common denominator**

Firstly, the EU has set 10 key policy objectives, upon which EU countries should design their CSPs. These objectives are focused on social, environmental and economic goals and are aligned with the ambitions of the European Green Deal. It is important to note that these objectives are not operationalized in terms of setting concrete and specific goals, due to the diversity of natural and structural conditions across the EU.

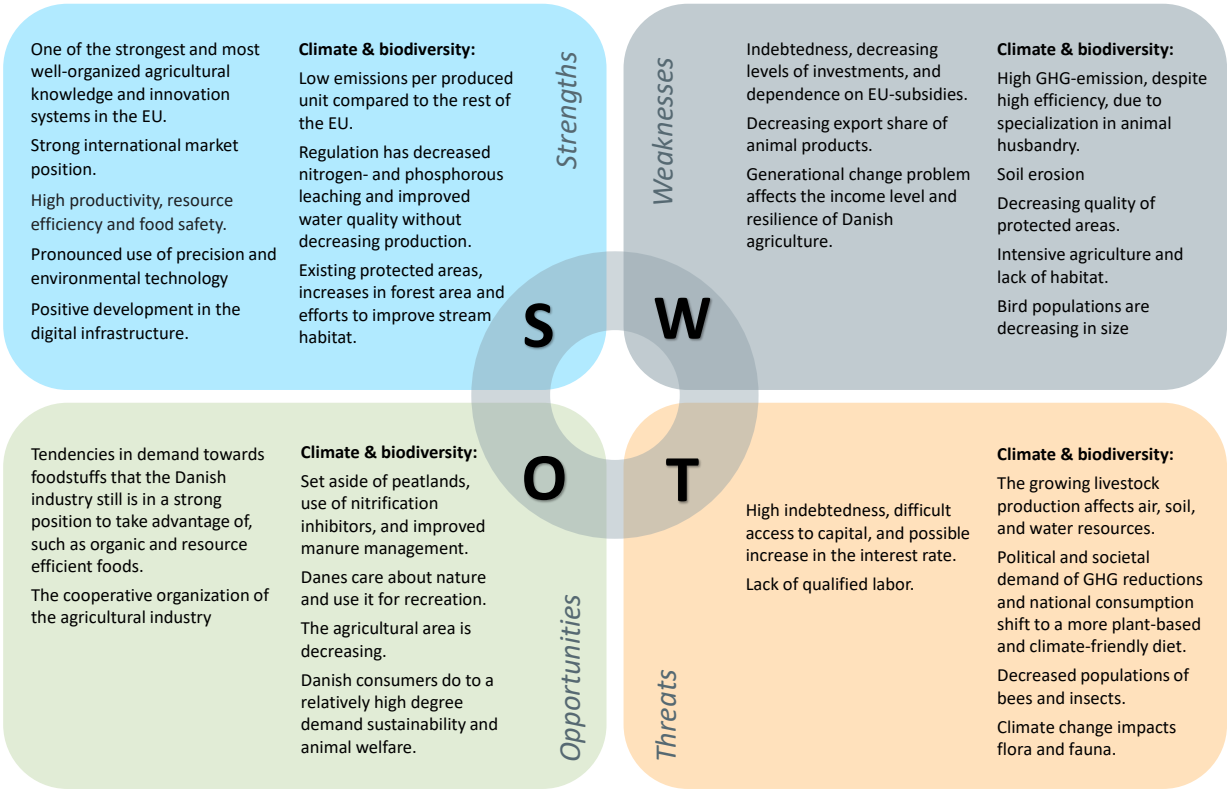



*Figure 1. The strengths, weaknesses, opportunities, and threats distilled in the SWOT-analysis are briefly in the Danish strategic CAP-plan.*

Instead, the objectives outline the topics to be addressed, leaving the setting of specific, actionable targets to the discretion of the Member States.

With the green architecture of the new CAP, the GAECs is setting a minimum standard for environmental efforts in the EU, as they serve as baseline requirements that farmers must meet to qualify for subsidy payments. Furthermore, Member States must allocate at least 25 pct. of Pillar I funds to eco-schemes. These schemes reward farmers who voluntarily adopt more environmentally and climate-friendly practices. While the eco-schemes are voluntary, farmers must follow the mandatory requirements, named GAEC's in order to fully qualify for direct payments. The Member States can voluntarily increase the requirements of the GAEC's, provided it is a relevant increase. The requirements of the GAEC are described in detail in chapter 3.1 regarding the conditionality.

**EU Commission has to approve CSPs with lower environmental ambition**

During the preparation of the CSP, the EU Commission conducts a structured dialogue with Member States, providing initial recommendations and responding to drafts with observation letters that offer feedback for improvements. This iterative process ensures that CSPs align with EU legislation, including the Climate Law and the objectives of the Farm to Fork (F2F) and Biodiversity strategies.

As a safeguard against inadequate CSPs, the EU Commission assesses the alignment of all Member States' CSPs with addressing national challenges, as well as compliance with EU legislation and commitments. The Commissions can also employ the 'no backsliding' principle.

However, the governance framework of the CAP limits the EU Commission's ability to incentivise environmental ambitions beyond existing EU laws and requires that assessments are based on legally binding national acts.

While there is a clear legal framework that defines Member States' obligations regarding CSPs, the actual adherence to these obligations can vary significantly, presenting a broad scope for interpretation. This can lead to divergent outcomes, which can undermine the overarching objectives of the policy, such as ensuring sustainability and uniformity in agricultural practices across the EU.

While the Commission can urge Member States to set national targets for key F2F Strategy objectives, it cannot compel adherence to its recommendations unless there is a violation of EU law obligations. Member States are expected to respond to observation letters but are not obligated to adopt recommendations unless legally required. This limitation often results in a status quo bias among some Member States.

A result of the new CAP governance framework is that the pre-allocated CAP budget envelopes are independent of the CSP quality and environmental ambition. Member States perceive pre-allocated CAP funds as theirs regardless of plan quality. Legally these allocations are part of the overall budget decision for each Member State, which is established by the Multiannual Financial Framework (MFF). This practice raises significant concerns about the effectiveness of these funds in promoting environmental sustainability, as it encourages prioritising budgetary considerations over impactful environmental actions within CSP.

**Monitoring framework does no indicate impact**

Monitoring progress and making adjustments based on assessed outcomes are crucial elements of the governance process, governed by the Performance Monitoring and Evaluation Framework (PMEF). According to the Strategic Plan regulation, Member States are required to submit annual performance reports to the EU Commission detailing the progress made during the implementation of their CSPs.

As described in the regulation, it is appropriate for the plans to contain a result-oriented intervention strategy, including quantified targets in relation to those objectives, which are based on result indicators, to allow for annual performance monitoring. The plans should also contain a specific description of the individual interventions, including the eligibility conditions, the budgetary allocations, the planned outputs, and the unit costs.

Result and output indicators, however, do not quantify impact but rather the uptake of measures. A result indicator, for example, measures the share of agricultural area or the number of animal units subjected to management schemes to reduce GHG emissions, but not the amount of emission reductions resulting from these management which the scheme entails.

The PMEF is based mainly on a 'process evaluation approach' which concentrates on the implementation process, understanding how and why the program produces certain outcomes. An impact-oriented approach could significantly enhance the effectiveness of the CAP, which is especially relevant given its substantial budget allocation to the EU's Multiannual Financial Framework. The CAP represents one-third of the EU's total expenditures, with 40 pct. of the budget dedicated to biodiversity and climate initiatives.

Conducting an annual impact evaluation of the green architecture within the EU CAP framework, could ensure that the CAP addresses public needs and challenges more effectively. However, impact-oriented policy making also faces challenges. Defining precise and measurable impacts is complex, particularly for broad or deeply entrenched social issues. To overcome these challenges significant resources for data collection, analysis, and continuous monitoring, is needed.

Based on all the CSPs, the EU Commission has estimated that the plans allocate nearly 32 pct., or close to EUR 98 billion, of the total public CAP funding to deliver specific environmental benefits for climate, water, soil, air, biodiversity, and animal welfare which goes beyond the conditionality. However, the potential impact of this budget allocation has not been assessed.

If cases arise, where the results achieved are significantly below the milestones of the CSP, the EU Commission can ask the Member States to submit an action plan, setting out the remedial actions. Member States has an interest in complying with the legally binding targets, otherwise they risk reductions in their pre-allocated funds, penalties, or infringement procedures. An interim evaluation will be made in 2026, but the impact of the 2023-27 CAP is only evaluated ex-post, in 2031.

The EU Commission is working to develop the relevant methodologies for estimating climate impacts of CSP measures. For this process it is important to start with a solid baseline to accurately assess changes, using scientifically validated models for reliability. Data collection should prioritise high quality and relevance, incorporating both direct and indirect effects of CSP measures.

**Member States lack the incentive**

The governance framework gives the Member States flexibility to use the CAP funds to enhance the sustainability in the agriculture sector, and support implementation of national targets which are legally binding. Thus, the effect of the 2023-27 CAP will depend on the political will for each country, and ability to make ambitious policies as well as the farmers willingness to implement voluntary measures. There are however concerns regarding the capacity of Member States to design robust strategies, their level of ambition, and the data availability for monitoring implementation.

Despite the EU Commission's provision of technical assistance, doubts persist about Member States' administrative capabilities to produce high-quality plans. The ministries governing the CAP funds may undervalue strategic planning or not take the needed environmental objectives into consideration. Limited institutional capacity as well as the mindset and skills among officials can also be a constraint. Strategic planning necessitates setting targets, evaluating progress, and adjusting as needed and in the case of some interventions data availability may be inadequate to support evidence-based policymaking.

## 3.1 Conditionality

Conditionality is linked farmers' compliance with various EU standards to their eligibility for CAP payments under a system known as "cross-compliance." The new CAP reform has expanded and intensified these requirements to better integrate environmental and climate. Conditionality requires all farmers applying for CAP subsidies to live up to a set of nine GAECs, see table 1.

If GAECs standards are not respected by European farmers, they will not receive the full amount of direct income support through the CAP. Malta and Denmark were the only EU Member States which implemented all 9 original conditionalities in 2023. However, due to pre-existing requirements, as well as normalised good agricultural practices, farmers in Denmark comply with most of the requirements listed in the conditionalities.

There is thus little additional effect of the conditionalities towards climate, biodiversity, and environment. The only conditionality which has a significant additional effect is GAEC 8. As previously mentioned, the enhanced GAEC 8 will be removed from the CAP's conditionality, but the Danish government is obligated to achieve the effects intended by the enhanced GAEC 8. Around June 2024, the government will present a plan outlining how it intends to maintain the current level of ambition. This example highlights the benefits of incorporating the CSP into national political agreements, as it can help prevent backsliding.

*Table 1. The 9 Good Agricultural and Environmental Conditions*

| | Description | New in the 2023-2027 reform | March 2024 simplifications |
|---|---|---|---|
| GAEC 1: Maintenance of permanent grassland | Farmers in Denmark must collectively maintain the area of permanent grassland[1] to a minimum of 3 pct. below the area in 2018. If the area of permanent grassland in Denmark is reduced by 3 pct. compared to 2018, it is no longer allowed to change areas with permanent grass, and if there is a 5 pct. reduction, farmers will be required to reestablish permanent grasslands. | GAEC 1 is a continuation of one of the existing three green requirements in Denmark. The reference year has been changed from 2015 to 2018, and organic farmers are now included in the conditionality, but no changes with additional climate or environmental effects are expected from. | MS' will be given some flexibility to consider structural changes in the conversion of permanent grassland areas. |
| GAEC 2: Protection of wetlands and peatlands | Tilling is not allowed on soils with a carbon content of >12 pct. in §3 areas[1]. Areas with a carbon content of min. 6 pct. have reduced nitrogen standard | GAEC 2 is a continuation of requirements in the national nature protection law and the reduced nitrogen standard corresponds to the existing national standard for organic soils. Thus, no changes with additional climate or environmental effects are expected. | No changes to GEAC 2 under the 2024 simplifications. |

| | | | |
|---|---|---|---|
| GAEC 3: Ban on burning of crop residues on arable fields | GAEC 3 bans the burning of crop residues unless it is important for plant health reasons. Therefore, it is still allowed to burn crop residues from seed grass on areas where seed grass is to be grown the following year as well. | Burning of crop residues has been illegal in Denmark since the 1990's. Thus, no changes with additional climate or environmental effects are expected. | No changes to GEAC 3 under the 2024 simplifications. |
| GAEC 4: 3-metre wide buffer strips along streams and lakes | GAEC 4 requires farmers to establish 3-metre buffer strips along mandatory streams and lakes. It is not allowed to till, fertilise, or make use of chemical plant protection in the buffer strips. | The GAEC 4 is an extension of the existing requirement of 2-metre buffer strips along mandatory streams and around lakes, which must be expanded to 3-metre buffer strips. There is thus a small additional effect. | No changes to GEAC 4 under the 2024 simplifications. |
| GAEC 5: Tilling-ban on soils with high risk of erosion | GAEC 5 requires that soils with an erosion rate of >7.5 ton soil per ha per year are not tilled in the period October 1st to February 15th. | GAEC 5 is a continuation of the existing soil erosion requirement. There are no changes to the requirement except that the map of areas designated as erosion sensitive has been changed based on a more recent erosion map from the University of Aarhus. No changes with additional climate or environmental effects are expected. | Certain crops, soil types and farming practices can be exempted from complying (applies also to GAEC 6 and 7). |
| GAEC 6: Soil cover during periods with increased risk of soil degradation | Requirement of plant cover on agricultural land, with a few exceptions, during specified periods in fall and winter to reduce risk of nutrient leaching and soil erosion. | GAEC 6 is very close to Danish national regulation on plant cover during periods with increased erosion risk. No significant environmental effect is expected. | Member States will have more flexibility in defining periods with increased risk of soil degradation. |
| GAEC 7: Crop rotation on arable fields | GAEC 7 requires crop rotation on arable and consists of two sub-requirements, 1) On 35 pct. of the agricultural area a new crop must be sown annually, and 2) the same crop can only be sown on the same area three years in a row. | Replaces the former green requirement of several different crop categories depending on farm size. Crop rotation may have benefits for soil- and crop health. However, no additional green effects can be quantified. | Farmers can now fulfil this requirement by choosing to either rotate or diversify their crops. |

| | | | |
|---|---|---|---|
| GAEC 8: Minimum requirement of non-productive areas on all farms | GAEC 8 requires farmers to set aside a minimum of 4 pct. of their arable agricultural area as non-productive elements and areas in the form of fallow, buffer strips, small biotopes, field thickets, lakes, or historical monuments. | GAEC 8 partly replaces previous requirements such as Ecological Focus Areas[2]. In addition, field thickets[3] could be included in GEAC 8 as existing non-productive areas. Additional effects are expected for an area of 63.500 ha. | Farmers will no longer be obliged to set aside a minimum part of their land as fallow land. Voluntarily keeping land as fallow will be rewarded through an eco-scheme. |
| GAEC 9: Protection of permanent grassland in environmentally vulnerable areas | Not allowed to till or change permanent grasslands in special habitat areas, designated as environmentally sensitive. | A larger area is now part of the GAEC 9 requirement covering a total of 19,200 ha. An additional effect is expected on the new areas included in the requirement. | Targeted exemptions to allow ploughing to restore permanent grassland in Natura 2000 sites in case it is damaged |

Description of the nine conditionalities, whether they are additional or are continuations of existing requirements. Information about the conditionalities is obtained through Danish Agricultural Agency's (DAA) descriptions. Information about the 2024 CAP simplifications is retrieved from the EU-Commission and the European Parliament.

[1]A grassland will be classified as permanent grassland after 5 consecutive years.
[2] Areas such as lakes, peatland, meadows and waterways, which are protected under §3 of the Danish Nature Protection Law. No tillage, pesticide or fertiliser application is allowed, and it is not allowed to convert areas protected under §3 to farmland.

[3] Ecological Focus Areas were introduced as part of the greening measures under the CAP reform in 2013 to ensure that agricultural practices contribute to the protection of the environment.

[4] Field thickets are existing small biotopes located within subsidy-eligible fields with a minimum cover of 75 pct. bushes or trees. They must be between 100 $m^2$ to 0.5 ha and not narrower than 10m at any point.

### 3.1.1 GAEC 8

GAEC 8 is a conditionality which obliges farmers to set aside at least 4 pct. of their agricultural land as non-productive[4] areas if they want to access the full direct payments. In the Danish implementation this has to be 4 pct. of the arable area only, excluding the area with permanent crops. Non-productive elements can be mown fallow, flower- or pollinator fallow, lakes, historic sites, new biotopes, buffer zones, and existing field thickets. There are no rules regarding the plant cover for mown fallow areas, but they must be mowed once a year no later than October 25th.

For pollinator fallow, specific types of flowers must be included in the flower mix, while any flower mixture can be used for flower fallow as long as it contains a minimum of two different nectar-producing plant species per square metre. For both flower and pollinator fallow, the fallow areas need to have a minimum of 50 pct. plant cover, which includes nectar-producing plants and must be reestablished every second year, which involves harrowing and resowing of the area. To protect birds and other wild animals living in the fallow areas, mowing is forbidden between May 1st and July 31st.

4 'Non-productivity' means that no agricultural operations, such as soil tillage or harvesting, is allowed the entire calendar year, except for the requirements which are specific for the non-productive elements such as mowing during the specified time windows. Grazing, with a few exceptions, is not allowed in GAEC 8 areas as it is seen as a means of production.

Existing fallow areas and field thickets can be counted as a part of the GAEC 8 area. However, existing nature on agricultural land cannot be included, as the aim of the conditionality is to create new non-productive areas to improve biodiversity, meaning that areas must be placed on arable agricultural land eligible for subsidies. The exceptions are field thickets and small biotopes consisting of a minimum of 75 pct. bushes and trees.

Therefore flower and pollinator fallow require more complex management with specific planting and maintenance protocols that include soil cultivation and seeding.. These factors make them more resource-intensive and expensive to implement compared to the relatively straightforward practice of maintaining mown fallow.

**Low additionality**

GAEC 8 has resulted in the set aside of approximately 99.000 ha of agricultural land as non-productive areas and elements in Denmark in 2023. This corresponds to 4.3 pct. of the arable agricultural area and 3.9 pct. of the total agricultural area in Denmark.

DAA data shows that there has been 2,700 ha registered as field thickets, GAEC lakes and historic sites and according to the Danish CSP 32.800 ha of GAEC 8 would in 2023 be existing fallow land registered as Ecological Focus Areas in 2022. Consequently, GAEC 8 was applied to an estimated area of 35,500 hectares consisting of existing non-productive areas, resulting in no additional effects from the previous CAP. A total area of 63,500 ha of new non-productive area was registered as a result of GEAC 8, corresponding to 2.5 pct. of the agricultural area in Denmark, see figure 2. As mentioned in the introduction, it is important to acknowledge that previous CAP elements, such as the 'Ecological Focus Areas,' have preserved existing non-productive lands. However, with the new 'simplifications' and the removal of the enhanced requirements of GAEC 8, there is an increased risk of converting these pre-existing non-productive areas into arable lands. Such conversions would directly negatively impact the climate, environment, and biodiversity.

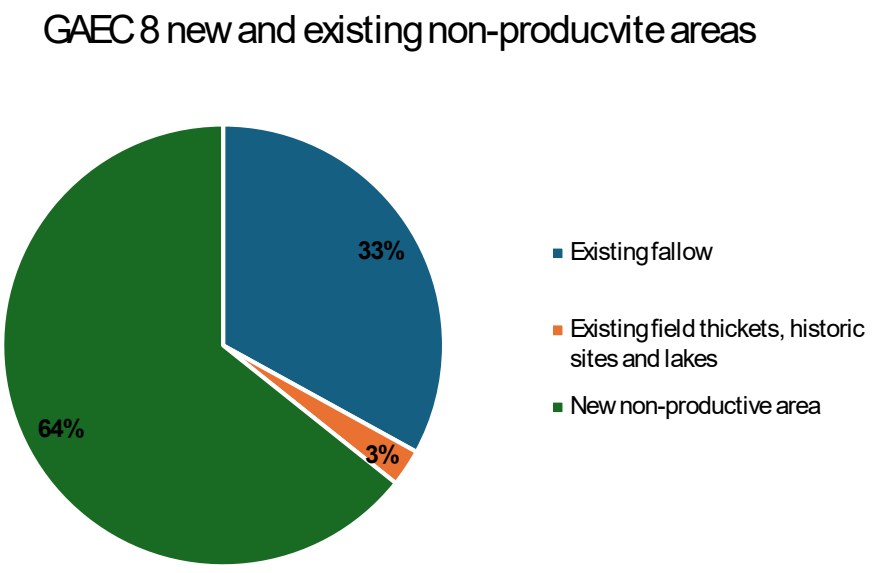



*Figure 2. New and existing non-productive areas under GAEC 8 in 2023.*

**Short-term mown fallow - an insufficient biodiversity measure**

Figure 3 illustrates the distribution of the registered GAEC 8 areas and shows that 94 pct. of the area was used for fallow. Figure 3 also illustrates that 85 pct. of the GAECs 8 areas are mown fallow, where there is no requirement regarding plant cover, meaning that the fallow area likely is dominated by volunteer plants from last year's main crop and weeds. Fallow can provide an undisturbed habitat benefitting common farmland organisms. However, mowing is a disturbance which can negatively impact these organisms. It also causes homogenization of the vegetation and may increase the probability of local extinction of butterflies.

Farmers will most often choose to place their GAEC 8 areas on the land that is least productive or hardest to cultivate, and thereby keep the GAEC 8 areas in the same place year after year. This is beneficial in both a production and biodiversity perspective, as marginal land gives low yields and has higher biodiversity potential. However, there are currently no requirements or incentives to prevent the relocation of fallow areas each year, posing a risk to the long-term biodiversity benefits of GAEC 8 areas. Short-term fallow can potentially have as much negative as positive impact on organisms in the agricultural landscape. Short-term fallows increase the risk of creating ecological traps[5], which influence insects and arthropods living near the soil surface and are negatively impacted by soil disturbance. Studies show that long-term fallow areas provide a higher quality habitat which better support farmland birds compared to short-term fallow.

Therefore, short-term mown fallow is not an effective strategy to improve farmland biodiversity. It is important to create and maintain more robust ecosystems through fallow lands of longer duration that are more strategically managed compared to the generalised shorter-term requirements of GAEC 8.

A list of recommendations based on scientific guidelines on how to improve biodiversity on fallow land is provided in appendix 3. Modifying the requirements in GAEC 8 to target specific biodiversity outcomes would be feasible for the Danish government, given the flexibility granted in the current EU CAP framework.

However, since this part of GAEC 8 is eliminated with the new simplifications, it may not be worthwhile to pursue.

**Not targeted to sufficiently improve biodiversity**

Homogenization of landscapes through agriculture, including the decrease of semi-natural areas and increase of monocultural fields, is a major threat to biodiversity within agricultural landscapes. Agricultural land generally has low biodiversity potential when managed intensively, e.g. due to the high nutrient content of the soil, pesticide residues and the lack of natural hydrology due to drainage. Therefore, a targeted approach to improve habitats is necessary to support biodiversity in the agricultural landscape, especially in intensively managed farmland such as in Denmark. It is supportive to set aside agricultural land for biodiversity purposes, however there are several aspects of the actual implementation of GEAC 8 which are not ideal or even problematic for biodiversity.

Year-round, extensive grazing is generally beneficial for biodiversity. Research shows that grazing is a more effective management strategy for maintaining biodiversity than mowing, particularly on agricultural land with high nutrient levels as

5 Ecological traps refer to the situation where organisms cannot complete their reproductive cycles within the sites and most eggs deposited into plants or soil as well as developing larvae are destroyed when the field is cultivated again.

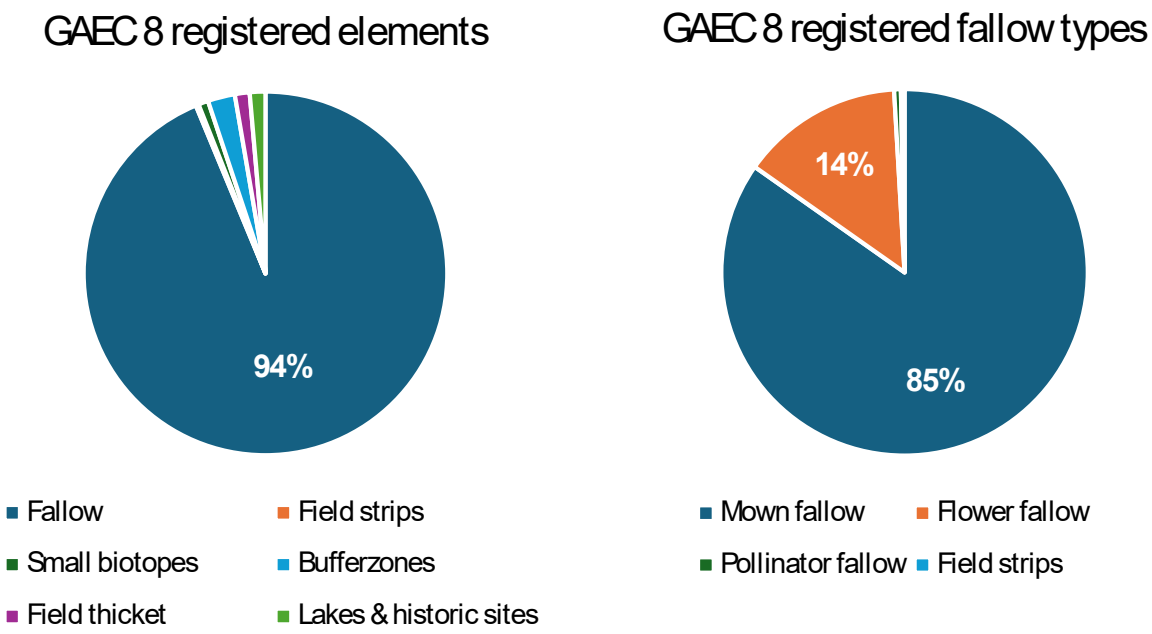



*Figure 3. GAEC 8 registered non-productive elements and fallow types expressed as the share of the total GAEC 8 areas.*

it often results in a few plant species becoming dominant. Grazing helps increase both the structural diversity of the vegetation and the variety of plant species. However, grazing is not allowed on the GAEC 8 fallow lands, instead a yearly mowing is required.

Flowering plants improve the food resources for organisms in the field and thus better support insects and also farmland's birds and mammals. However, flower and pollinator fallow only makes up 15 pct. of the GAEC 8 area in 2023.

Small biotopes increase biodiversity in the farmland and the inclusion of woody species both introduces more vegetative diversity in the agricultural landscape and provide ecosystem service such as erosion control. Small biotopes are also more likely to provide long-term effect as they cannot easily be moved around once planted with woody species. However, there is no incentive for farmers to choose small biotopes over fallow. In 2023, less than 1 pct. of the GEAC 8 areas were small biotopes.

A negative side-effect of GAEC 8 is that its conditionality does not protect existing semi-natural areas, as its primary objective is to create new habitats. Although additional semi-natural habitats would enhance farmland biodiversity, GAEC 8 has inadvertently incentivized the clearing of existing biotopes on farmlands e.g. clearing of permanent grass lands to establish non-productive elements. The area with permanent grassland reduced approx. 1,400 ha from 2022 to 2023 indicating a slight conversion of these semi-natural habitats, see figure 11. This occurs because only areas that are part of the crop rotation qualify for GAEC 8.

**Some additional effect on reducing GHG emissions and nitrogen leakages**

GAEC 8 has reduced GHG-emissions through reducing the use of fuel, reducing nitrogen leaching, reduced fertilisation and liming. GAEC 8 conditionality resulted in the additional set aside of 2.5 pct. of the total agricultural area.

This has led to an estimated reduction of 0,08 mil. tonnes $CO_2e$, see appendix 4 regarding how this was calculated.

This estimate does not take into account the potential negative climate effect of clearing of biotopes and cultivation of permanent grassland. According to The Danish Council on Climate Change, approx. 21 million tonnes $CO_2e$ are stored in the existing biotopes on farmland. This number reflects the maximum potential, of how many tonnes of $CO_2e$ could have been released, however the 'National Climate projection' from the 2023, shows that there was not change in the LULUCF[6] category 'grassland transitioning to cropland' the last three years.

Therefore, this potential negative effect might be so small that the national climate projections did not detect it, and/or the carbon stored in the biotopes on farmland are not sufficiently registered in the climate inventories. The additional non-productive areas will also result in reduced nitrogen leaching to the aquatic environment, and the effect is estimated to 631 tonnes N, see appendix 4 regarding how this was calculated.

**Less production on marginal soils**

The area cultivated with grain in Denmark has been reduced 13 pct. from 2018 to 2023 and 6 pct. from 2022 to 2023, see figure 4.

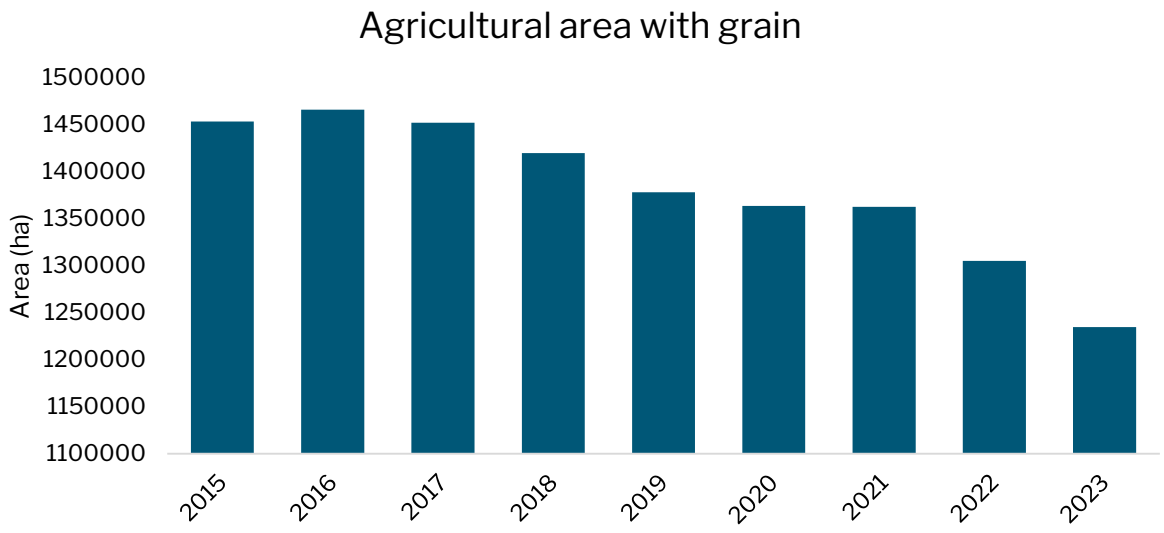



*Figure 4. Development in the agricultural area with grain from 2015 to 2023. Data obtained from Statistics Denmark.*

Meanwhile the area with fallow land has increased 64 pct. from 2022 to 2023, and 117 pct. over the last five years, see figure 5. Fallow was on the top-10 list of common crops in Denmark in 2023.

6 LULUCF stands for 'Land Use, Land-Use Change, and Forestry'. It is a term used in the context of greenhouse gas inventories and refers to the land sector.

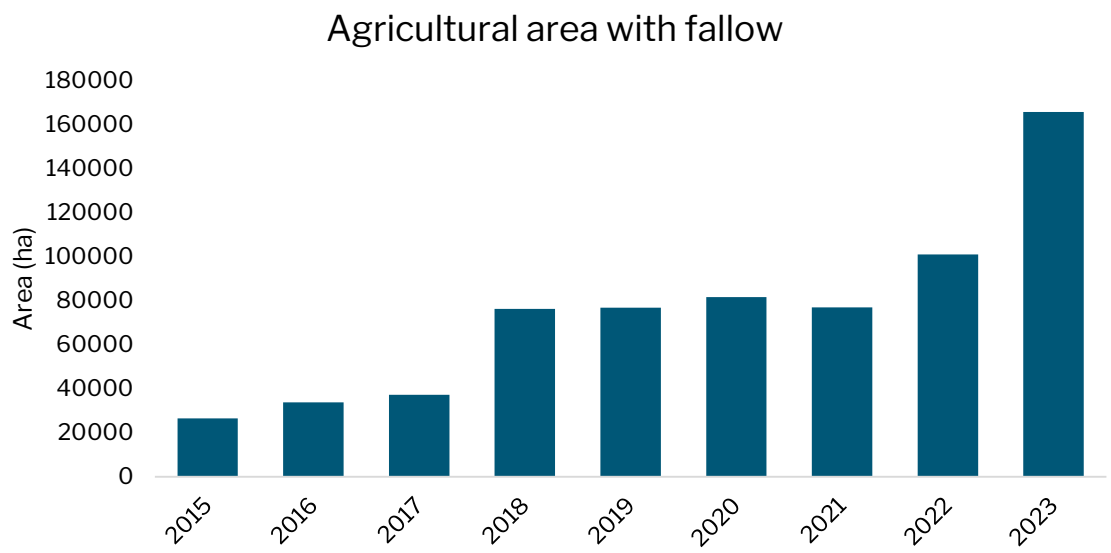



*Figure 5. Development in the agricultural area with fallow from 2015 to 2023. Data obtained from Statistics Denmark.*

There has been a significant reduction in the quantity of harvested grain in Denmark in 2023 when compared to the average harvest of the past decade, as illustrated in figure 6. Statistics Denmark has reported 7.14 million tonnes of harvested grain in 2023, which is 25 pct. less compared to 2022 and 22 pct. less compared to the average annual grain harvest between 2015 to 2022. The weather conditions, especially severe early summer drought and late summer storms in 2023, have also negatively influenced the harvest. An estimated 24 pct. reduction in spring barley yield has been reported in 2023.

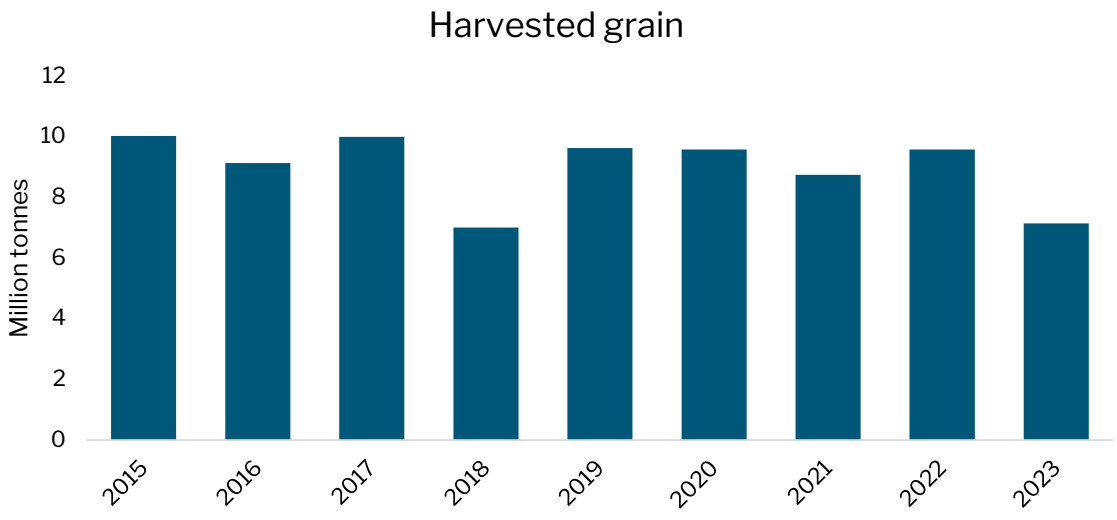



*Figure 6. Development in the amount of harvested grain from 2015 to 2023. Data obtained from Statistics Denmark.*

The reduction in grain production is a result of poor harvests, a decrease in cultivated areas in favour of other crops, and an increase in fallow land and the overall productivity[7] in the agriculture sector reduced approx. 5 pct. from 2022 to 2023. As farmers are incentivized to locate non-productive areas on marginal soils, a 4 pct. reduction in the total crop rotation area in Denmark does not equate to a 4 pct. reduction in total output. An economic projections for Denmark's agricultural sector anticipate an approx. 18 pct. increase in crop production in 2024, assuming a normal harvest. Removing the least productive areas from agricultural use, while keeping productive lands in production offers several environmental and economic benefits, as marginal lands typically require excessive inputs but yield lower returns.

**The EU Commission should enhance the conditionality, facilitate Member State knowledge exchange and improve monitoring and evaluation of the GAECs**

Conditionality sets the baseline for environmental standards that partially determine direct payments. In Denmark, only GAEC 8 had an additional effect beyond the green requirements of the previous CAP plan (2014-2020). However, with the 'simplification' of the CAP, the conditionality has not been enhanced relative to the previous CAP period, and none of the GAECs will have an additional effect.

The situation varies from Member State to Member State depending on factors such as pre-existing national regulations, predominant agricultural practices, environmental and climatic conditions, and the implementation and enforcement of policies. With the removal of the enhanced GAEC 8, the direct requirement for non-productive elements, present in the previous CAP period, no longer exists in the EU CAP framework. In 2021, there were 1.9 million hectares of non-productive elements, and it was expected that the 2023-2027 reform would increase this to 3 million ha. This backsliding in the protection of farmland biodiversity only increases the gap toward achieving the EU Biodiversity Strategy's target of at least 10 pct. high-diversity landscape features on agricultural land by 2030. In the proposed nature restoration law GAEC 8, along with AECMs and relevant eco-schemes, is mentioned as instrumental in striving toward the 10 pct. target.

To improve the environmental benefit of the GAEC's both the EU Commission and Member States should take action to raise the level of ambition as well as facilitate a smooth implementation which farmers can relate to and integrate in their operation. At the EU level the EU Commission can enhance GAEC conditionality, to make the GAECs more stringent and impactful, ensuring that they significantly contribute to environmental sustainability across all Member States and lowering additionality as presented above. Given the latest changes to the CAP, this seems unlikely to happen within a short timeframe. However, the EU Commission could increase the support for the Member States to facilitate knowledge exchange on how to best implement the GAECs.

The EU Commission should intensify the evaluation of the GAECs. In 2022, the Commission released an extensive study of all the CSPs, which mapped out the plans and assessed their potential effects. However, the study did not quantify these effects. This omission represents a significant gap in our understanding and management of the CAP's effectiveness in achieving its environmental and agricultural goals.

7 The overall productivity is defined as the ratio between the quantitative expression for production and total factor consumption, see further explanation here.

Providing a quantified estimate of the new CAP's impact at the start of the implementation period would establish a crucial baseline. The absence of such a baseline undermines the effectiveness and credibility of the entire CAP framework.

The study concludes that the '*CSPs contain positive elements in terms of contributing to climate change mitigation, but the overall impact from Member States' choices in the CSPs remains uncertain'* as well as '*… the combination of the enhanced requirements for GAEC 8, covering landscape elements and non-productive features, together with the choices made on voluntary interventions in the CSPs seem to indicate that there will be an increased contribution from the CAP towards the biodiversity objectives'.*

These conclusions already have reservations in relation to the climate effect and biodiversity improvements of the new CSP, however given the simplifications of the GAECs, and the findings in this paper, it is questionable whether the conclusions from the study still hold true.

**Member States should improve the implementation of the GAECs and enhance their effect**

Member States should not tolerate reducing the green ambitions of the CAP. Coalitions of ambitious Member States should collaborate to maintain and elevate the level of ambition at the EU level, sharing strategies on how to sustain and enhance the implementation of the GAECs nationally.

Member States have the flexibility to implement the GAECs more ambitiously than the EU minimum requirements. This could include setting stringent standards for soil health, biodiversity, and water conservation. Additionally, Member States could boost awareness and provide extensive training for farmers on how to effectively implement the GAECs.

Aligning the GAECs more closely with national environmental strategies and objectives can also maximise their impact. Given that Denmark was among the few countries implementing GAEC 8 effectively, it could share its experiences with other Member States interested in expanding areas designated as non-productive. This collaboration could help prevent the clearing of existing semi-natural areas in other Member States.

## 3.2 Eco-schemes

With the new CAP, five eco-schemes have been introduced in Denmark. Eco-schemes are mandatory for Member States to include in their CSPs, but the schemes are voluntary for farmers to apply for. Eco-schemes are area-based and provide an economic incentive for applying certain types of agricultural and land-management practices to an area. All of Denmark's eco-schemes are annual, however Member States can also decide to make them multi-annual. Eco-schemes are mandated to constitute at least 25 pct. of direct payments for the 2023-2027 period, yet Member States have the option to allocate all of their Pillar I funding to eco-schemes if desired. However, in practice, eco-schemes are often treated merely as supplements to the direct payments.

The Danish eco-schemes are currently designed as annual schemes. However, many of the desired goals of these schemes require persistent changes in agricultural practices and land use.

Therefore, the annual approach lacks the potential to significantly facilitate lasting environmental impacts and does not support farmers to make long-term investments in more sustainable production systems.

The EU Commission has provided a list of potential agricultural practices that eco-schemes could support. The schemes aim to enhance biodiversity, reduce environmental impact, and promote sustainable agricultural practices, contributing to national and EU climate, biodiversity, and organic farming goals. Each Member State has the flexibility to customise the eco-schemes to specific national environmental and climate needs in their CSP. The EU Commission assesses and approves the CSPs. The eco-schemes are also recognized to be key tools for the CAP to deliver on the Green Deal targets.

The Danish eco-schemes are described in table 2 and key figures for the Danish eco-schemes in 2023 are listed in appendix 1.

Table 2. Descriptions of the Danish eco-schemes and their desired effects based on the Danish CSP.

| Eco-scheme | Subsidy rate [EUR/ha] | Description | Desired effects |
|---|---|---|---|
| **Climate and environmentally friendly grassland** | **201** | This scheme extends the duration of grassland by an additional year and can be applied to agricultural areas that have been with grass and have not been ploughed for a minimum of 2 years. The scheme does not apply to grasslands on natural or extensively grazed areas. | To increase carbon sequestration and the diversity of the soil fauna, as well as reduce nitrogen leaching. |
| **Biodiversity and sustainability** | **331** | This scheme gives a subsidy for taking agricultural land out of production with the aim of creating new non-productive areas for biodiversity purposes. The scheme cannot be applied to existing nature such as §3 areas, existing biotopes, or Natura 2000 areas. | Contribute to achieving the goals of the EU biodiversity strategy by 2030.<br>Nitrogen-leaching reductions and decreased GHG emissions are derived effects of reduced production. |
| **Diversified plant production** | **83** | This scheme aims to increase crop diversification while at the same time promotion production of certain crops. The scheme has requirements to the size of the areas on which the selected crop is grown as well as the number of crop categories that the farm cultivates. The selected crops can be found in appendix 2. | To increase crop diversification, especially the proportion of legumes and crops for human consumption. Contribute to more plant-based foods and national supply on protein-rich feed. To maintain soil fertility and improve soil quality, improve the utilisation of fertilisers, reduce GHG emissions, increase farm biodiversity. |
| **Nutrient extensification of grassland** | **473** | This scheme can be applied to agricultural areas that are eligible for basic income support and are either organic soils (min. 6 pct. carbon) or designated as edge areas in river valleys. DAA's map shows eligible areas. The scheme requires that the area is mowed, and biomass is removed, and that all other agricultural activity is stopped. | Production on organic soils are stopped annually which should prepare them to enter rewetting projects through nutrient exhaustion, thereby contributing to reaching climate goals as well as the targets in the Water Framework Directive. |

| | | | |
|---|---|---|---|
| **Organic farming** | **117** | The scheme gradually replaces the five-year commitment scheme for organic farming. It is possible to apply for basic support for certified organic areas, for conversion support during the two years of conversion to organic agriculture and for additional support for fruit and berry production as well as reduced nitrogen input. | Contribute to maintaining the existing, as well as increasing the organic area, to achieve the national goal of doubling the organic area by 2030.<br>Achieve benefits for climate, environment, biodiversity, and animal welfare. |

**Low uptake of eco-schemes in 2023**

In 2023, the budget for the eco-schemes was approx. 107 million EUR, which corresponds to 25 pct. of the Danish budget for the basic income payments. As figure 7 illustrates, all the schemes had lower rates of uptake than expected resulting in around 67 million EUR being utilised, which is approx. 60 pct. of the budget. The low uptake level can be explained by uncertainties regarding how to implement the schemes and new policies in practice. The instruction guides[8] for the eco-schemes were published in February 2023 which only left 3 months from the publishing of the instructions to the deadline for application of the eco-schemes on April 28th, 2023. This is a short window for farmers to both understand the new schemes and plan the implementation of it into the 2023 growing season. This underlines that preparation time is necessary for a new regulation to be understood and implemented.

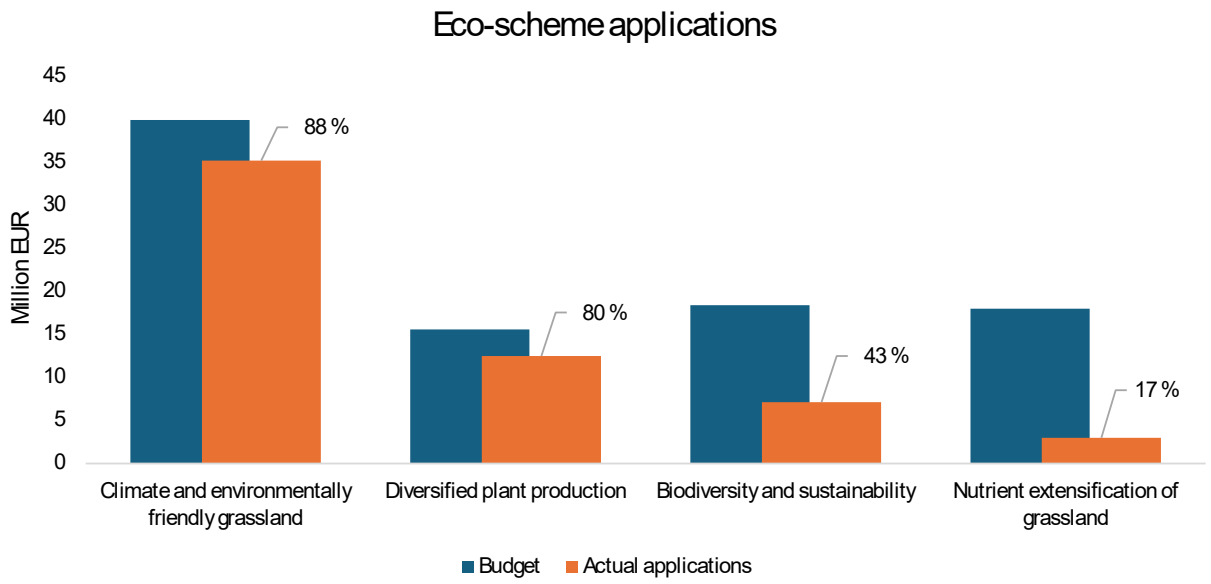



*Figure 7. Illustrates the expected and actual applications for the different Danish eco-schemes in 2023 expressed in the budget for each scheme and the amount of money applied for each scheme. The share of the budget which was used for each eco-scheme (pct.) is indicated in the diagram. Source: The Danish Strategic CAP-plan 2023-27 and a Review of selected figures for applications on the CAP funds in 2023.*

Despite offering higher subsidy rates than other eco-schemes, 'Biodiversity and Sustainability' and 'Nutrient Extensification of Grassland' have been notably less popular, see table 2. The uptakes were respectively 43 pct. and 17 pct in 2023, see figure 7. Those two schemes only covered 1 pct. of the agricultural land in Denmark.

8 Instruction guides for 'Climate- and environmentally friendly grassland', 'Biodiversity and sustainability', 'Diversified plant production' and 'Nutrient extensification of grassland'.

The low uptake of the 'Biodiversity and Sustainability' and 'Nutrient Extensification of Grassland' eco-schemes can be attributed to their focus on fallow and extensification, which may disincentivize farmers. This is particularly significant given the new, mandatory requirement under GAEC 8 that farmers set aside 4 pct. of their land as non-productive. Additionally, the limited popularity of some eco-schemes may be due to competition with other measures. For instance, GAEC 8 and the 'Nutrient Extensification of Grassland' eco-scheme both target the same marginal lands. The low participation rates suggest that the subsidies offered were not sufficient to incentivize farmers to engage with the eco-schemes. Additionally, there was significant market pressure due to high commodity prices in 2023, as illustrated in figure 15.

The eco-schemes 'Diversified plant production' and 'Environmental and climate-friendly grassland' is designed to support sustainable agricultural production rather than set aside areas, which is the effect of the 'Biodiversity and Sustainability' and 'Nutrient Extensification of Grassland' eco-schemes. 'Diversified plant production' and 'Environmental and climate-friendly grassland' were more popular with an uptake rate of respectively 88 pct. and 80 pct., which amount to 13 pct. of the agricultural land in Denmark.

Although eco-schemes cover 14 pct. of Denmark's agricultural land, result of figure 8, this percentage does not necessarily mean that 14 pct. of the land is managed in more environmentally friendly ways. This issue will be further explored in subsequent chapters.

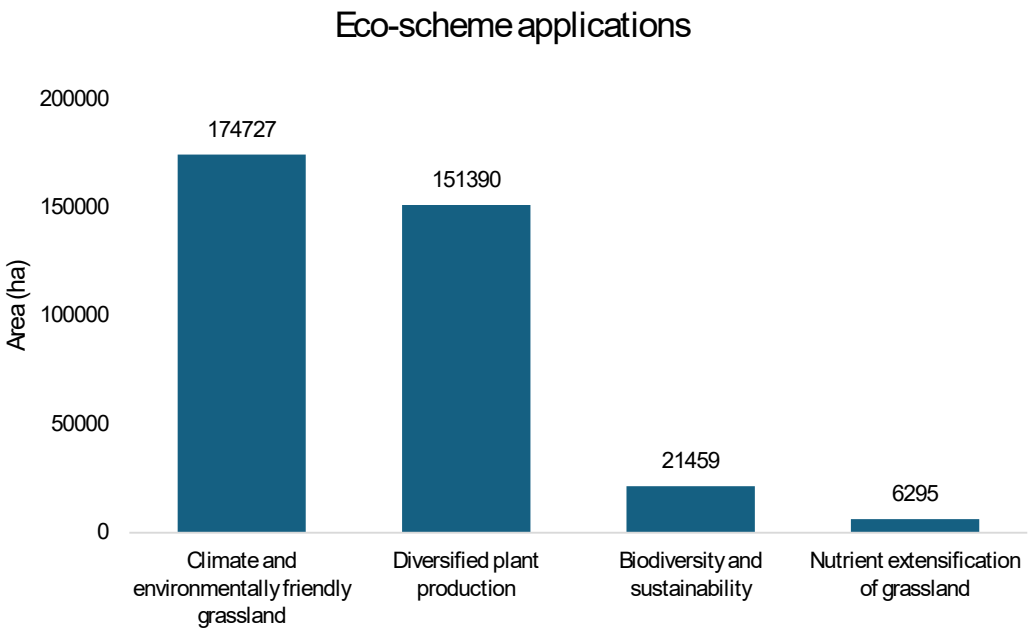



*Figure 8. Illustration of the applications for the new Danish eco-schemes in 2023 expressed in the area applied for per scheme. Source: DAA: 'Review of selected figures for applications on the CAP funds in 2023.'*

**Improving the regulatory framework of eco-schemes**

The uptake of eco-schemes in 2023 was disappointingly low, falling short of meeting the requirement that 25 pct. of the budget for direct payments be allocated to eco-schemes. Actual uptake was only 16 pct. The EU Commission has granted the Member States a two-year 'learning period,' allowing for potentially lower uptake in 2023 and 2024. However, Member States are expected to compensate for this shortfall by the end of 2027.

To increase farmer participation, the schemes must be made more appealing. This necessitates clear guidance on implementing the various schemes, a responsibility that falls to the Member States, and in this context, specifically to the Danish government.

There is a risk that Member States may reduce the ambition levels of eco-schemes to make them more attractive to farmers and thereby facilitate easier compliance with the 25 pct. target. Additionally, there is a concern that Member States might lower the ambition of eco-schemes in response to the reduced requirements of the GAECs which were put in place with the changes to the CAP, see table 1.

The legal framework governing eco-schemes mandates that their ambition must exceed the standards set by conditionality. However, it does not specify the extent to which they must surpass these requirements. Moreover, the legal basis of the eco-schemes permits a low amount of additionality as they can compensate for established, normalised good agricultural practices that exceed conditionality but are already widely implemented nationally.

At the EU level, the requirements for eco-schemes could be strengthened by raising the standards and obligations outlined in the conditionality. This would elevate the baseline for eco-schemes and require a higher level of ambition. However, as noted in the previous chapter, the simplification of the GAECs has reduced the impact of the GAECs, making this approach unlikely in the short term.

Alternatively, the EU Commission could propose broadening the legal framework of the eco-schemes by stipulating that the ambition levels should significantly exceed a national baseline. This would mean that established good agricultural practices, common across various production systems in different Member States as well as pre-existing regulation would set the baseline, and the eco-schemes would then encourage farmers to significantly surpass this level.

**A point-system for the eco-schemes could be a way forward**

A point system for eco-schemes could represent a significant step forward. An 'above-the-baseline' point system could be developed, using clearly defined national baselines which could be built on the data from the SWOT analysis and the CSP. This system should be integrated into the CSPs and establish relevant baselines for areas Member States aim to enhance, such as climate impact, biodiversity, animal welfare, and reduced water pollution. The baseline setting should be based on the SWOT analysis results.

Additionally, it would be advantageous for the baseline to differentiate between impacts conditioned by existing policies and those stemming from 'normalised good agricultural practices' to clearly establish the additional impact a potential eco-scheme might have. For example, baselines could be established through comprehensive remote sensing mapping of current land use types to prevent any unwanted changes.

Moreover, the method for allocating points needs to be developed. Points within the eco-schemes should be awarded based on their potential environmental benefits, assigning higher points to practices that significantly enhance biodiversity, sequester carbon, or improve water quality.

To ensure a high level of ambition, the point system should include quantifiable targets for each eco-scheme, aligned with environmental goals. Additionally, a minimum requirement on additionality within the Member States eco-schemes should be established to maximise effectiveness.

The point system should encompass an implementation strategy, a monitoring and adjustment process, and ongoing impact evaluations. Arla's[9] incentive model, which is based on a point system, could serve as a blueprint for designing an 'above-the-baseline' point system. Additionally, the Dutch eco-schemes measure impact primarily through a results-focused point-based system, rather than simply checking compliance, to actively engage farmers. This Dutch model could also provide inspiration for establishing a point-based system.

Developing an above-the-baseline point system should be actively pursued by the different Member States within the EU, and the EU CAP framework offers the flexibility for Member States to do this. However, it would be more beneficial if the EU CAP framework not only provided this flexibility but also actively facilitated, supported, and mandated Member States to develop such systems. This enhancement could be integrated into the framework of the CSP. Implementing such changes would ensure that eco-schemes align financial incentives directly with environmental outcomes, thereby driving substantial improvements in biodiversity, soil health, water quality, and climate impact more effectively.

**Performance monitoring and evaluation framework provides limited information about the impact**

The Performance Monitoring and Evaluation Framework (PMEF) is a crucial tool for the effective implementation and achievement of the CAP strategic objectives. The primary role of the PMEF is to provide a structured approach for assessing CAP performance by monitoring and evaluating actions under the Member States' CSP. The EU Commission oversees the entire lifecycle of policy implementation—from planning and approval to monitoring, evaluation, and adjustment. This comprehensive oversight ensures that CAP functions as an effective and coherent tool for supporting sustainable agriculture and rural development across the EU.

**BOX 1.** Two examples from the PMEF guidelines on how to measure the effect of CAP 2023-2027.

An example of an output indicator related to the eco-schemes is the O.14 intervention '*Environmental, climate-related and other management commitments'* where the indicator is *'Number of hectares or number of other units covered by environmental or climate-related commitments going beyond mandatory requirements*'.

Another example in this case of the result indicator R.13PR '*Reducing emissions in the livestock sector*' is measured by '*Share of livestock units (LU) under supported commitments to reduce emission of greenhouse gases and/or ammonia, including manure management*'.

Member States must submit annual performance reports to the EU Commission, documenting progress against output and result indicators, which reflect the expected uptake of the eco-schemes under various objectives. Box 1 illustrates the use of output and result indicators within the PMEF guidelines.

9 Arla Foods is a global dairy cooperative based in Denmark, owned by dairy farmers primarily from Denmark, Sweden, the UK, Germany, Belgium, Luxembourg, and the Netherlands.

The indicators primarily measure the participation and implementation rates and are not designed to monitor whether the eco-schemes contribute to the CAP's strategic objective of significantly elevating its environmental and climate ambitions. While participation and implementation rates are essential for ensuring that financial resources are allocated effectively, neither the output nor the result indicators directly measure the actual environmental impact or the quality of the interventions.

The overall assessment of the performance of the CAP 2023-2027, where impact indicators will be applied, will not be presented before December 31, 2031. This is highly problematic as it allows for an extended period of undetected inefficiency, unaddressed environmental impacts, and misallocation of resources.

There is a need for more immediate and ongoing evaluation mechanisms that can provide quicker feedback and allow for more responsive policy adjustments. The PMEF would greatly benefit from being more dynamic, responsive, and effective in near-real-time environmental impact assessments.

This report is one example of how the impact of the GAECs and eco-schemes can be assessed, mainly based on existing data provided by the uptake performance from 2023 and the emission/leaching factors, which were presented in the Danish CSP and therefore widely accessible.

The following sections will assess the effect of the implementation of each of the Danish eco-schemes.

### 3.2.1 Diversified plant production

In the political agreement on Danish agriculture there is a clear priority to the production of more plant-based foods[10] including plant protein and vegetables for human consumption, which was the purpose of the eco-scheme 'Diversified plant production' originally. However, the purpose has changed during the development of the eco-scheme, to mainly focus on diversifying the crop rotation as the CAP funds are solely used to support production and therefore do not regulate the use of the products, i.e. are the beans for human consumption or animal fodder. The eco-scheme is now designed to support the production of a list of subsidy-approved crops which can be found in appendix 2. The specific requirements of the eco-scheme is listed in box 2.

**BOX 2.** Eligibility criteria for the eco-scheme 'Diversified plant production'.

Subsidy-approved crops must be cultivated on a minimum of 5 pct. of the agricultural area of a farm, A farm of <20 ha must grow a minimum of two crop categories. A farm of 20-60 ha must grow a minimum of three crop categories, where the largest category makes up a maximum of 70 pct. of the farm's area. A farm of >60 ha must grow a minimum of four crop categories, where the largest category makes up a maximum of 70 pct. of the farms area and the two largest categories in total make up a maximum of 90 pct. of the farms area.

The list of subsidy-approved crops does contain some legumes and vegetables for human consumption to support the production of more plant-based foods. However, it also contains several crops which are mainly used for fodder, or which are classified as seed crops. The rationale behind including fodder crops is to limit the import of fodder which in some cases may be produced in environmentally harmful ways. The decision-making behind the selection of crops is generally to include crops which cover a relatively small share of the total agricultural area in Denmark, because this should help diversify the crop rotation.

10 The agreement states that "The contracting parties also agree to allocate 77.8 million DKK in 2023-2027 for an eco-scheme for plant-based foods".

The selected crops are in categories: fruit and berry, vegetables, oilseed, and legumes (apart from rapeseed), root vegetables incl. potatoes, linseed, and hemp.

**Low additionality**

Figure 9 displays the top-five most applied for crops in the eco-scheme, which include starch potatoes, sugar beets, fava beans, fodder peas, and spinach seed. Together, these crops constitute 74 pct. of the area covered by the eco-scheme, while the remaining 80 crops on the list account for only 26 pct. of the coverage.

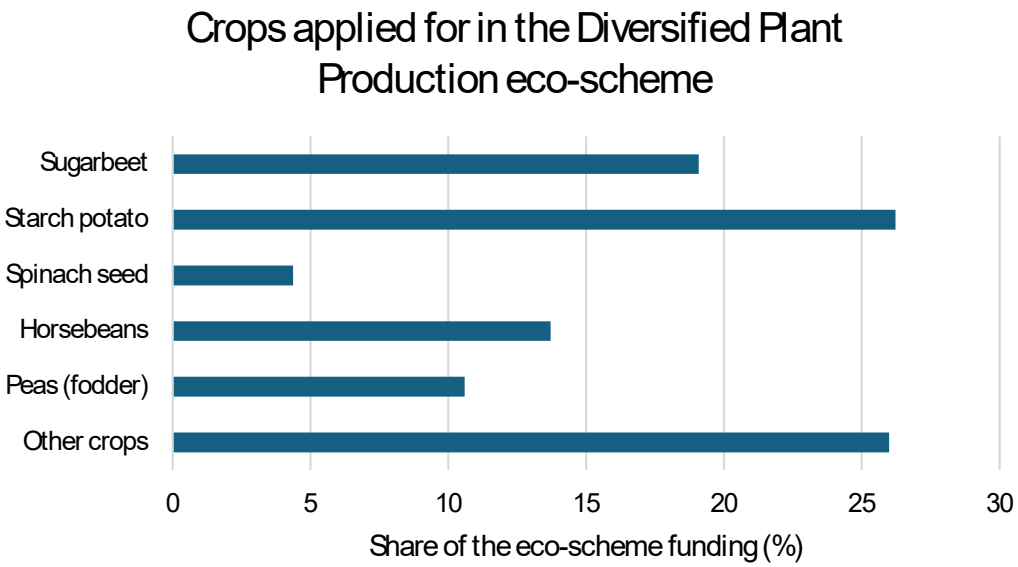



*Figure 9. The distribution of the eco-scheme funds on the top-5 crops which were most applied for and other which cover the remaining 80 crops on the list. Source: Unpublished data provided by DAA.*

CONCITO has estimated the share of the crops utilised for fodder for animals, for legumes, vegetables, herbs for human consumption, for industrial processing and for other purposes, see figure 10. The figure shows how the funds of the eco-scheme have been spent overall, illustrating that nearly half of the eco-scheme funding, 44 pct., has supported starch potatoes and sugar beets for industrial processing, 32 pct. has been used for fodder crops and 13 pct. of the funding has been used for legumes, vegetables, and herbs for human consumption.

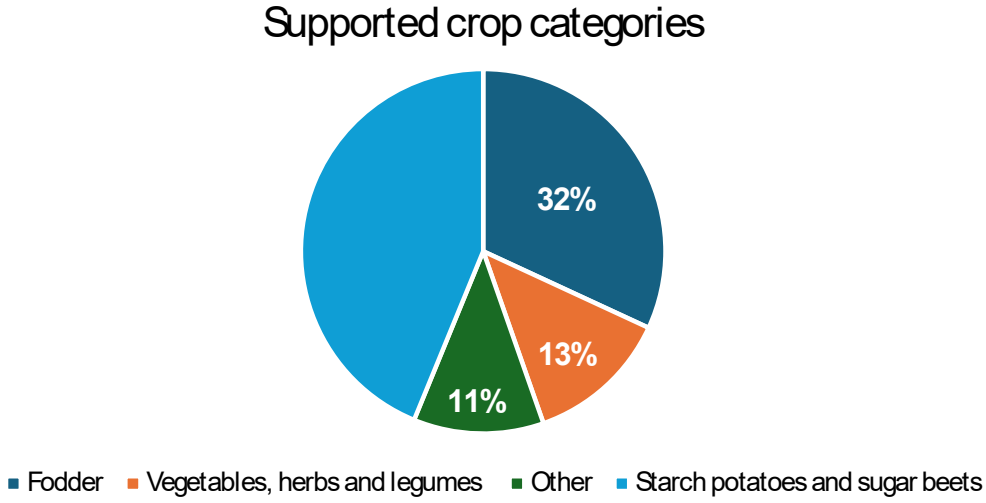



*Figure 10. Inventory of cropping area for the crops supported through the eco-scheme 'Diversified plant production', separated into three broad categories of human consumption, fodder, and other (mainly seed crops).*

Previous years there has already been a substantial production of starch potatoes and sugar beets in Denmark. The production of those crops under the eco-scheme 'Diversified plant production' is thus considered as low additionality. A study of the expected effects of the eco-scheme estimated 139,000 ha being non-additional with the current subsidy rate of 83 EUR/ha made by the University of Copenhagen. With a total area of 152,352 hectares covered by the eco-scheme that corresponds to 91 pct. being non-additional. The starch potato and sugar beet sectors had their payment entitlements[11] removed, with the implementation of this CAP reform, which resulted in the DAA to design this eco-scheme to function as a compensatory measure to these industries.

The crop inventory data from 2022 and 2023 was categorised into human consumption, fodder, and other crops and show that there has been an overall decrease of 1 pct. in the area of crops, which can be classified as foods for human consumption (plant-based foods). There has been a decrease of 59 pct. in the area cropped with legumes for human consumption, which is mainly due to a decrease in the area of peas for human consumption. The reduction in legume production for human consumption can be attributed to the closing of the only Danish pea factory in 2022, and it is clear that the addition of this eco-scheme has not made a significant difference.

The overall area with legumes for human consumption has decreased from 2022 to 2023, but three new crop codes for legumes, namely lentils, chickpeas and beans have been added to the official crop lists in 2023. This indicates a potential minimal shift in cultivation patterns and a diversification of legume varieties within the agricultural landscape.

Table 3. Inventory of cropping area and change in cropping area for the subsidy-approved crops under the 'Diversified plant production' eco-scheme. The crops have been categorised into human consumption, fodder and other based on agronomic evaluation of the most common use of these crops in Denmark.

| Crop categories | | Total area 2023 (ha) | Change from 2022 to 2023 (pct.) |
|---|---|---|---|
| **Human consumption** | Legumes | 1.192 | - 59 |
| | Vegetables and herbs | 19.807 | - 6 |
| | *Total* | *20.999* | *- 12* |
| **Fodder** | Legumes | 42.892 | 4 |
| | Other | 9.519 | 15 |
| | *Total* | *52.411* | *6* |
| **Other** | Seed crops | 18.324 | 5 |
| | Starch potatoes | 41.373 | 7 |
| | Sugar beets | 30.609 | - 4 |
| | Other crops | 665 | - 34 |
| | *Total* | *90.917* | *3* |

Based on the number presented in table 3, it seems that the eco-scheme has not had an effect towards increasing the area of the crops, which are supported through the eco-scheme.

11 Payment entitlements were an arrangement that differentiates area-based payments based on the type of production and farm history. With the removal of these entitlements, all farmers now receive the same direct payment per hectare.

The choice of which crops of the farmers to include in the crop rotation will depend on several factors beyond the small economic gain from this scheme. Factors determining the choice of crops for the farmers are the market prices and processing options, as seen with the closing of the pea factory. Finally, the risk of pests and diseases are important considerations of a good crop rotation.

Additionally, these eco-schemes can disturb the price formulation associated with these crops. Given that several of these crops are classified as niche crops and predominantly traded within the national market, traders may have the leverage to depress the prices offered to farmers, potentially offsetting the intended value of the associated eco-scheme. This reduction in price could undermine the primary incentive of the scheme, which was to increase the production of these crops.

Conversely, for commodity crops covered by this eco-scheme, the price formulation is linked to the global market, thus making the payments from the eco-scheme more supplementary and beneficial to the farmers. While subsidies are designed to support farmers, their implications need careful management to avoid unintended consequences that can undermine their objective. Agricultural subsidy and support schemes can distort market pricing and production incentives.

In summarizing the eco-scheme for diversified plant production, CONCITO has found that due to low additionality, 100 pct. of the funds utilized—totaling 13.7 million EUR—have been ineffectively spent. As a result, none of the allocated funds have contributed to the environmental objectives, making the expenditures ineffective in fulfilling their intended purpose.

**Eco-scheme provides insignificant support to more plant-based diets**

Starch potatoes have a variety of uses including both food and non-food purposes. According to KMC's[12] sustainability report, the processing of starch potatoes results in around 20 pct. of starch, 2 pct. of fibres, 2 pct. of protein, and 76 pct. of potato juice. KMC's sustainability agenda is to optimise the use of potato starch and fibres in plant-based foods. In the financial year 2021/22, KMC has replaced 32,450 tonnes of animal ingredients with plant-based ones from starch potatoes worldwide. This is an increase of 23 pct. compared to the year before.

While KMC is using their products to contribute to the development of plant-based foods, another large processor of starch potatoes in Denmark, AKV, is mainly selling their products to the paper industry. The potato protein is used for fodder, though there is research into using it for plant-based foods, and the potato juice is utilised for biogas production.

The production of sugar from sugar beets does not support the original purpose of the eco-scheme, which was to support plant protein and vegetables for human consumption.

**The scheme does not necessarily support production with a lower environmental footprint**

Apart from compensating the starch potato and sugar beet sectors, the argument in the Danish CSP for this eco-scheme is supporting the production of crops with a low carbon footprint. Additionally, it is argued by the DAA that the cultivation of these crops involves a lower risk of nitrogen leaching due to their long growing seasons and improved soil fertility.

12 KMC is a cooperative and the largest processor of starch potatoes in Denmark.

However, there is a high use of pesticides in potatoes, and the long growing season of sugar beets and potatoes severely constraints establishment of a post-harvest cover crops. Therefore, it is questionable whether production of potatoes and sugar beets should be eligible for support under this eco-scheme, as the environmental benefits are relatively low. In addition, production of potato starch and sugar has a high energy demand.

In conclusion, the eco-scheme, 'Diversified plant production,' initially aimed to promote the cultivation of plant-based foods, has primarily shifted towards enhancing crop rotation diversity. This scheme, now predominantly supporting crops utilised for fodder or industrial processing, highlights the complex interactions between policy intentions and agricultural practices.

**Two eco-schemes instead of one**

Requirements of diversifying the crop rotation can be a barrier for farmers, who want to grow high value, niche crops which can be part of a healthy and more plant-based diet. Similarly, requirements of including specific crops for human consumption in the crop rotation can be a barrier to farmers who are not interested in cultivating those specific crops but want to diversify their cropping scheme. CONCITO recommends dividing the eco-scheme into two separate schemes, one for plant-based foods and one for diversified plant production, avoiding any unintentional restrictions.

An eco-scheme for diversified plant production can, similarly to the one which has been implemented in Denmark, build on GAEC 7, and further diversify both the spatial and temporal diversification of the crop rotation on a farm. This is to support mosaic farm land areas with different crops which will benefit farmland biodiversity, soil fertility and pest management.

The eco-scheme should ensure additional effects compared to a national baseline, which is not the case with the existing requirements in the eco-scheme. The criteria for the design of an eco-scheme focusing on crop diversification could be; the number of crop categories depending on farm size, the spatial and temporal variation in crop categories, and limits on the maximum area that any single crop category can occupy. A progressive subsidy rate could be built into this scheme e.g. providing additional funding if the eco-scheme is part of an integrated pest management (IPM) strategy.

An eco-scheme for plant-based foods can have a list of crops, which are primarily used for human consumption, such as legumes for huma n consumption, nuts, fruit and berries, mushrooms, herbs, and vegetables. There is a need to strengthen the plant-based food value chain, and create more cohesion in the individual value chain links. Therefore, CONCITO recommends coupling an eco-scheme for plant-based foods with support schemes in pillar II, directed towards rural projects that work with marketing, processing, retail, and increasing demand for plant-based foods. While it can be expected that issues with price formulation will persist, as described above, it is unlikely that all of the subsidy will be marginalised by market pressures.

### 3.2.2 Climate- and environmentally friendly grassland

This eco-scheme extends the duration of grassland by an additional year and can be applied to agricultural areas that have maintained grass cover and have not been tilled for a minimum of two years. The scheme builds on GAEC 9 but is not limited to environmentally vulnerable areas as with GAEC 9. The purpose is to increase carbon sequestration, improve the soil fauna, and reduce nitrogen leaching according to the DAA.

This scheme has the largest budget amongst the eco-schemes, and besides the environmental objectives, the DAA stated that the eco-scheme is mainly designed to mitigate the financial consequences of removing the payment entitlements for the cattle sector, which in Denmark mainly consist of dairy producers. Thus the eco-scheme is designed to compensate the sector, which contributes the most to GHG emissions in the agriculture sector. This can be regarded as a misuse of eco-scheme funds, as eco-schemes are not a tool to compensate dairy farmers for a reduction in payment entitlements. Instead, eco-schemes funds should be used for climate and environmental purposes only.

**Relatively low additionality**

This eco-scheme has low additionality, as the average duration of grass in the crop rotation is three years in Denmark, which is the duration that is required to apply for this eco-scheme. The eco-scheme covered approx. 170.000 ha in 2023 whereof additional effects were estimated for 99.000 ha. This is estimated based on data regarding the length of grassland in the rotation from 2011-2018. A detailed description of the calculation is provided in appendix 4.

Figure 11 shows the area of both permanent and arable grassland in Denmark, which has been relatively stable over the last 5 years. However, the total area of grassland has reduced 2.7 pct. in 2023 compared to 2022, despite the additional support provided by this eco-scheme. The reduction in the area might be due to GAEC 8 conditionality, which could have incentivized farmers to rotate their grasslands to keep the area arable and use it to fulfil GAEC 8.

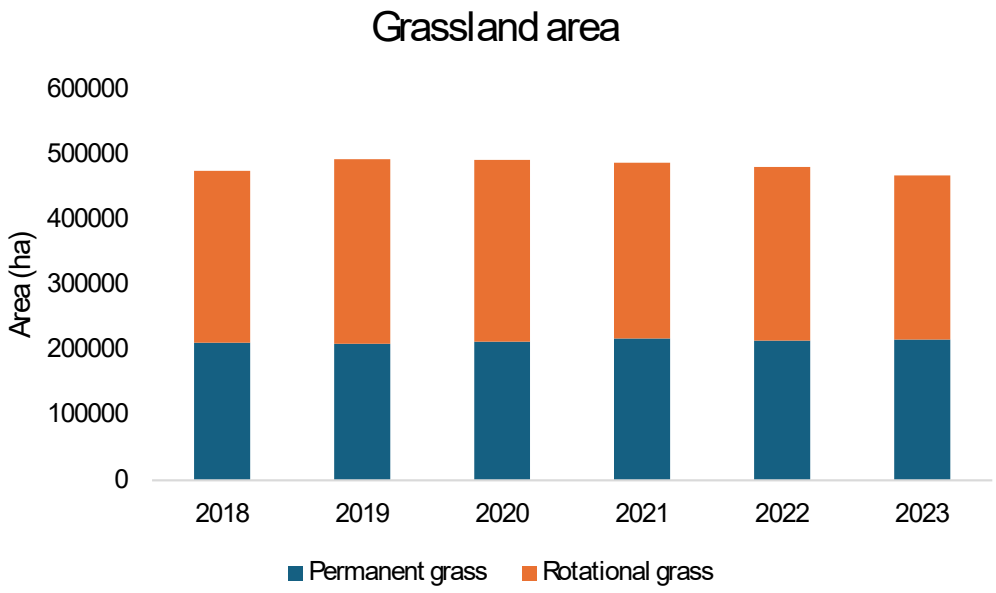



*Figure 11. The area of grass in Denmark from 2018 to 2023. Source: Denmark's statistic.*

This eco-scheme has not led to an expansion of grassland areas in Denmark during the first year of the reform. However, the potential for expanding grassland areas as a result of the eco-scheme may become apparent in the coming years, given that the scheme offers incentives for maintaining areas as grassland for three or more years.

CONCITO has found that due to low additionality in the eco-scheme for 'climate- and environmentally friendly grassland,' approximately 67 pct. of the allocated funds—totaling about 21 million EUR—have been spent ineffectively. Consequently, only 33 pct. of the funds are effectively contributing to environmental objectives, rendering the majority of the expenditure ineffective in fulfilling its intended purpose.

**Minimal effect on climate and nitrogen leaching**

It is estimated by CONCITO that this eco-scheme has led to a carbon sequestration of 0.01 million tonnes $CO_2e$. This is calculated based on the area which can be said to be additional, approx. 99,000 ha, and the expected potential carbon sequestration effect of grass 110 kg $CO_2e$ per ha per year. As fertilisation is allowed on the grassland, no fertiliser associated GHG emission reductions are estimated for this measure.

As grasses are efficient at absorbing nitrogen from the soil CONCITO has estimated an effect of reduced nitrogen leaching to the aquatic environment of 260-973 tonnes N. This is based on the reference value of 9.86 kg N per hectare per year reduction in leaching to the aquatic environment for fallow land, as no data was available on the reduction potential for grassland. Calculations are further explained in section 3.3, as well as appendix 4.

The large variance in the potential nitrogen effects of the scheme, depend on the geographical location of the grassland, the duration of grassland, the timing of ploughing, which crop grass substitutes and where it is placed in the crop rotation.

**More grass in the crop rotation and longer duration should be incentivised**

CONCITO recommends that the eco-scheme is modified to provide a graduated subsidy based on both the duration of grassland as well as the amount of grassland in the crop rotation, e.g. additional funding if the duration is prolonged from three to five years. To increase the effect of reducing nitrogen leaching, CONCITO recommends that this eco-scheme is regionalised and thereby targeted for coastal catchment areas as well as other areas with a high risk of nitrogen leaching, where the grasses could increase the absorbing nitrogen.

Furthermore, CONCITO recommends that this eco-scheme could provide an additional extra funding for the farmers if the grassland achieves a biodiversity status eligible to be protected under the national Nature Conservation Law and become a §3 area, as mentioned by Organic Denmark.

Finally, CONCITO recommends excluding organic soils to enter into the scheme, as it could lead to competition between this scheme and rewetting projects.

### 3.2.3 Organic farming

The certified organic agricultural area in Denmark has slightly decreased over the last few years, and so has the area under conversion to organic agriculture, see figure 12 below. Only 74 pct. of the subsidies for organic agriculture were utilised in 2023, which indicates that there is a continued trend of reduced uptake of organic production.

The Danish government has established an organic production goal to ensure that by 2030, 21 pct. of Denmark's total agricultural land will be dedicated to organic farming.

Today the organic area makes up approx. 11 pct. of the total area. The certified area will probably decrease in the coming years judging from the development in areas under conversion to organic illustrated in figure 12. This trend challenges both the national target and the EU objective of reaching 25 pct. organic agriculture by 2030. To counteract this trend the DAA has increased the payment for organic agriculture from 117 EUR in 2023 to 161 EUR in 2024.

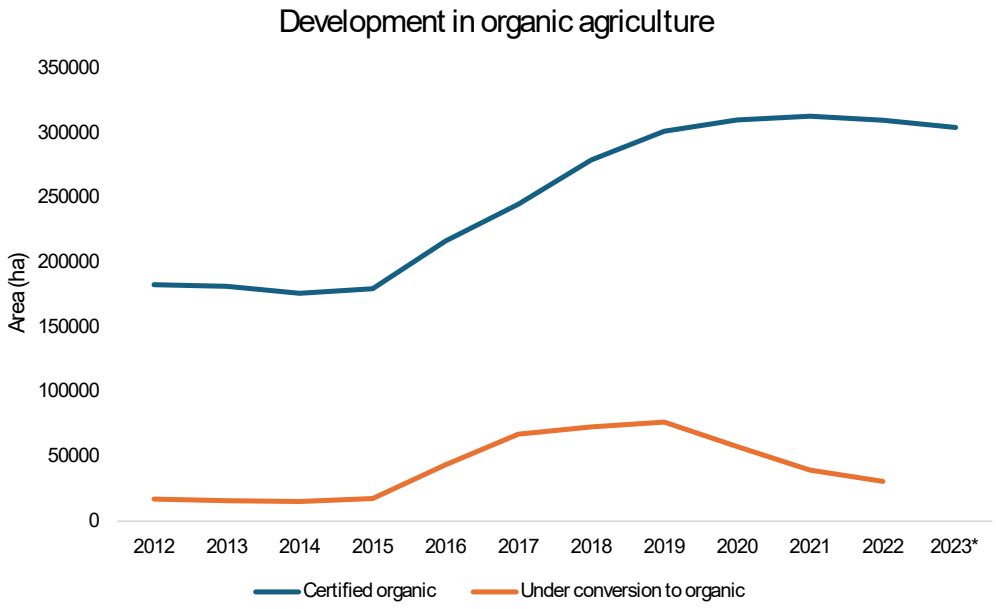



*Figure 12. The development in the area of organic agriculture, as well as the area under conversion to organic agriculture, in Denmark between 2012-2023. Data from 2012-2022 is from Statistics Denmark and *data for 2023 is from the Inventory of crops on organic areas 2023.*

**Demand has decreased**

A reason why organic agriculture is not expanding as hoped may be found in the demand rather than on the production side. Statistics Denmark has in a recent analysis documented a decrease in the organic milk production, due to change in consumers preferences toward avoiding expensive products, including organic, due to inflation and generally higher food prices. Examining trade patterns in organic products reveals a notable uptrend, particularly in the export of Danish organic meat to Germany and the increased import of organic fruits and vegetables to Denmark, primarily sourced from Italy and Spain. Overall, Denmark has experienced a rise in the export of organic products, with dairy and eggs emerging as the predominant category.

In conclusion, organic agriculture is facing challenges as current trends indicate a decline in both the certified organic area and the land transitioning to organic farming. The Danish government has presented a strategy on how to increase organic production in Denmark which strives to increase financial, educational, and technical support to the sector. Modeling of the Danish agricultural sector, which treats organic farming as an independent parameter, projects a 35 pct. increase in organic farming area from 2020 to 2030. This indicates that the eco-scheme is falling short of meeting the stated targets in the organic strategy.

### 3.2.4 Biodiversity and sustainability

The main goal of the scheme is to contribute to Denmark's fulfilment of the objectives of the EU's biodiversity strategy by 2030. This eco-scheme builds on the GAEC 8 conditionality, and incentivizes farmers to set aside more than 4 pct. of their arable agricultural area as non-productive areas and elements. Farmers cannot use the same land for both this eco-scheme and the GAEC 8 requirement. However, if a farmer sets aside 7 pct. or more of their land as non-productive, they receive a bonus; namely only 3 pct. will count towards the GAEC 8 requirement, and they will get eco-scheme subsidies for 4 pct. of the 7 pct. of land they set aside. As the area with fallow land highly increased in 2023, see figure 5, it is assumed that this eco-scheme has a high additional effect.

In 2023 approx. 22,000 ha of non-productive area was registered for this eco-scheme, where 96 pct. was fallow elements and 4 pct. were small biotopes. Figure 13 illustrates the distribution of the eco-scheme area on different elements and shows that 84 pct. of the area is mown fallow, and 12 pct. is flower fallow. Less than 1 pct. is pollinator fallow. The subsidy rate was in 2023 368 EUR no matter which type of non-productive element was established.

As described for GAEC 8, there are no requirements regarding plant cover for mown fallow, meaning that the area likely will be dominated by volunteer plants from last year's main crop or fast-growing weeds and grasses which thrive in the fertile agricultural soil. Mown fallow offering certain benefits such as erosion control and some level of biodiversity support, generally has a more limited ecological function compared to the structured and often more diverse habitats provided by other non-productive elements. For the flower and pollinator fallow, the area ought to have a minimum of 50 pct. plant cover which includes some nectar-producing plants.

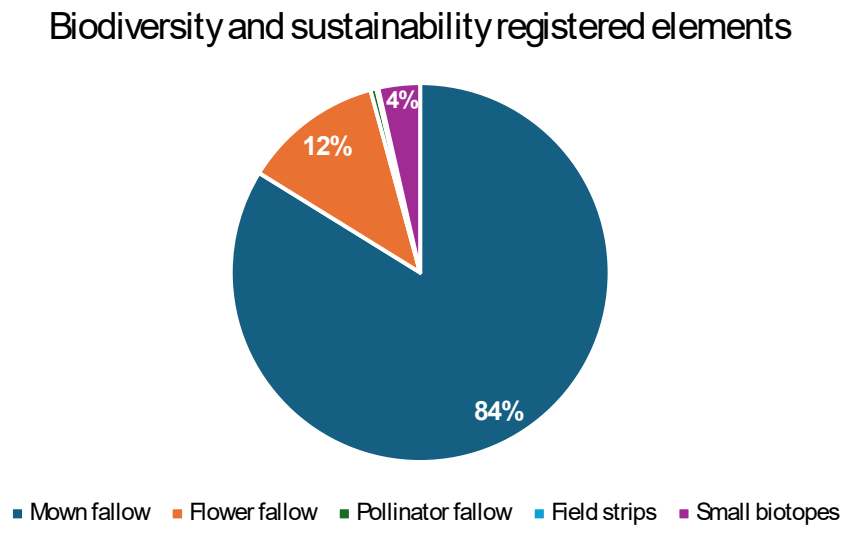



*Figure 13. The distribution of the area registered for the eco-scheme on different non-productive elements. Data obtained from DAA in a Review of selected figures for applications on the CAP funds in 2023*

**Increasing the potential to improve biodiversity**

In the 2024 application round the DAA introduced an incentive structure in the eco-scheme, which means an additional 200 EUR per hectare with pollinator fallow. With the new top-up farmers can achieve a support rate of up to 578 EUR per hectare under the eco-scheme if they sow a pollinator mix on their fallow land, which thus to a greater extent will be able to promote biodiversity. Assuming 10 pct. of the applicants to the eco-scheme apply for the pollinator fallow top-up, and there is a full uptake of the scheme, it will result in a 6 pct. reduction in the area which the scheme can cover. For improving biodiversity, it is beneficial to ensure a higher biodiversity value on set aside areas, even though the total area is decreased. The DAA is already proclaiming that there has been a lot of interest in applying for the eco-scheme 'Biodiversity & sustainability' this year, including the new supplement for pollinator fallow, which indicates that payment levels are high enough to incentivize a sufficiently high uptake. It is important that subsidies such as the eco-schemes are equal to farmers' opportunity costs when implementing the respective changes. Too low subsidies will lead to insufficient application and implementation of the eco-schemes, too high subsidy rates on the other side, will over-allocate money to public services beyond their value to society. Further research should be conducted, exploring the subsidy price setting of the eco-schemes in Denmark.

**Smaller farms have more set aside areas than larger farms**

There is a correlation between farm size and the amount of non-productive area set aside, as the largest farms[13] on average set aside 4. pct. and the smallest farms[14] on average set aside 30 pct. This suggests a correlation between farm size and the willingness to allocate land for biodiversity purposes. It may imply that larger farms, which benefit from economies of scale, find it less economically appealing to receive subsidies for non-productive activities compared to cultivating cash crops. Conversely, smaller farms demonstrated a higher interest in supporting biodiversity on their lands. Given that owners of large farms possess the majority of agricultural land in Denmark, it is crucial to make eco-schemes enticing for them as well, encouraging the implementation of biodiversity initiatives on their land.

**Reduced GHG emissions and nitrogen leaching**

This eco-scheme has led to an estimated reduction of 0.028 million tonnes $CO_2e$ and a reduced nitrogen leaching to the aquatic environment of 217 tonnes N[15]. The effects are less than half of what could have been achieved if there had been a full uptake of the scheme.

Overall, the scheme has shown that some farmers are willing to work on improving the farmland biodiversity, but the interest was limited. There should be more incentives for activities that enhance biodiversity beyond just pollinator fallow, such as creating small biotopes. The results of a recent survey amongst Danish farmers has shown that most farmers place considerations for nature higher than the economy of the farm and that 95 pct. of the farmers surveyed state that it is important to take nature into account on their farm.

13 Average size 150 ha
14 Average size 10 ha
15 See further details on how this was calculated in chapter 3.3 and appendix 4.

This indicates that it is not a lack of interest for biodiversity among farmers which is behind the low implementation of the new biodiversity measures. Therefore, there is a great opportunity to enhance the effect of this eco-scheme on biodiversity if the design of the scheme considers the financial incentive necessary to make the scheme more attractive for farmers to implement.

**Prioritise long-term commitments and areas with a high biodiversity potential**

Measures to improve biodiversity should differentiate between the generalist species found on farmland and the more threatened species in protected areas. On farmland, biodiversity improvements that also support production could be effectively managed using an Integrated Pest Management (IPM) approach, incorporating flexible point systems.

To enhance biodiversity beyond farmland, CONCITO recommends the development of a multi-annual scheme that prioritises the protection of existing biotopes and promotes long-term conservation efforts. The eligibility criteria for this scheme should be regionalized and based on advanced mapping tools to identify and prioritise areas for conservation. Maps such as the High Nature Value map, Nature Index map, or/and the Green Map of Denmark, could be used to determine which areas are eligible for the scheme. Specific eligibility criteria should include biodiversity potential, current land use, and potential for habitat connectivity.

Incentives could be provided through supporting management practices that enhance habitat quality, such as establishing buffer zones around existing habitats, encouragement for the use of variety mixtures, intercropping compagnie crops. Higher rates could be offered for longer-term commitments to develop sustainable habitats.

To encourage larger farmers to participate more actively in the scheme, higher per-hectare payments could be awarded as the total area set aside increases, or bonuses could be provided for larger contiguous blocks of habitat covered by the scheme. Since biodiversity builds up over an extended period, CONCITO recommends linking eco-schemes for biodiversity with biodiversity projects under Pillar II.

**Communication is key**

To better implement these strategies CONCITO recommends enhancing communication and supporting farmers with consultations and education on how to integrate biodiversity measures into their practices effectively. This includes providing clear, accessible information on eco-schemes and their benefits for biodiversity and agriculture.

**Improve measuring and monitoring**

Developing better biodiversity indicators and monitoring standards to accurately track changes and effectiveness of biodiversity policies is also a recommendation by CONCITO. Currently it is hard to measure biodiversity and there is a lack of both a baseline, easily applicable and measurable biodiversity indicators, as well as concrete goals to track and evaluate biodiversity both in and outside the agricultural landscape. Indicators could include species richness and abundance, population metrics, habitat extent and quality, and soil health and measurements could include e.g. ecological connectivity between habitats and high-quality habitat relative to total land area.

### 3.2.5 Nutrient extensification of grassland

This eco-scheme covers organic soils with a minimum of 6 pct. carbon content, buffer zones and river valleys. The purpose of this eco-scheme is to reduce the emission of greenhouse gases and nitrogen from organic soils through extensification of agricultural production in the short-term. In addition the scheme also intends to contribute to a gradual depletion of the nutrient content in the soil through mowing and removal of the biomass as well as a ban on fertilisation, which will limit the potential phosphorus leaching and methane emissions if the area later is rewetted.

**Low participation rate**

In 2023, this eco-scheme was applied to approx. 6,300 hectares of land, only 17 pct. of the planned area. One reason is likely competition with GAEC 8 areas. Another reason may be that the scheme simply is not attractive to farmers the way it is designed now. From 2024, grazing will be allowed under certain requirements, which may make that scheme more attractive to farmers. The eco-scheme's current complexity, restrictions and competitive positioning with other policies limit its attractiveness and effectiveness of the scheme, see the description below.

**Relatively low additionality**

In 2023, 65 pct. of the land under this eco-scheme was arable grassland in 2022, indicating that these marginal soils were not intensively cultivated previously. The last 35 pct. is assumed to be previously covered by grain cultivation. The effect of having grassland compared to extensive agricultural production is limited, as such 65 pct. of the land under this eco-scheme does not deliver much additional effect, resulting in a high degree of non-additionality.

The eco-schemes potential loss due to non-additionality of 67 pct., corresponds to 2 million EUR of the 3 million EUR for this initiative being lost. Consequently, only little of the applied-for funds contribute to environmental objectives, rendering the expenditure ineffective in achieving its intended purpose.

**Low effect on climate and nitrogen**

The effects of this scheme were low due to the low uptake as well as the level of non-additionality. Climate and nitrogen leaching effects were not estimated for the 65 pct. which was previously grassland. Therefore, the estimated climate and nitrogen effects only related to the 35 pct. of the area, corresponding to 2100 ha, which most likely shifted from being crop land to extensive production.

The estimated climate effect of the eco-scheme only amounts to 0.003 million tonnes $CO_2e$. This estimation is based on emission factors from fertilisers and saved fuel and liming. The reduction in nitrogen leaching to the aquatic environment was estimated to be 27 tonnes N, based on a leaching factor of 13.05 kg N per hectare per year reported in the Danish CSP[16]. See a detailed description of the effects in appendix 4.

Rewetting of organic soils is a substantial part of the plan for reducing the GHG emissions from Danish agriculture as it makes up a larger share of the total emissions. Danish farmers have applied for approx. 50,000 ha of agricultural soils to be rewetted in February 2024, including organic soils and buffer zones.

16 The calculations are further explained in section 3.3, and in appendix 4.

The political goal is by 2030 to have rewetted 100,000 ha of organic soils including buffer zones. The gradual depletion of the nutrient content in the soil through removal of the biomass through a one year scheme, does not substantially contribute to the rewetting process as depletion takes a long time while the carbon content in the soil also gradually depletes. In theory, it is positive to have this eco-scheme aiming to progress rewetting projects, however the current policy design of the scheme competes with permanent rewetting projects. Thereby the scheme offers minimal environmental benefits.

The eco-scheme will be discontinued from 2025, because there has been a limited uptake for the scheme. From the autumn of 2024 the DAA will open a new scheme for permanent extensification of agricultural areas. The new eco-scheme, 'Permanent extensification', is designed to support the extensification of agricultural lands. The size of the grant varies depending on the land's previous use—€11,050 for areas that were part of the crop rotation and €4,757 for permanent grassland. The subsidy is a one-time payment. Areas included in this scheme will remain eligible for direct payments if agricultural activities continue, such as grazing and mowing.

A servitude, which is a type of legal easement, must be registered on the property, and restrict farmers from using pesticides or fertilisers as well as not plough, plant, or otherwise cultivate the land. The servitude may stipulate that the land be available for potential future water or climate projects, indicating a long-term commitment to maintaining the land's status. The DAA will handle the process of registering the servitude and will cover the associated registration fee. The scheme is still awaiting final approval from the EU Commission.

## 3.3 Overall environmental effect of the GAEC 8 and the eco-schemes

The effectiveness of the enhanced conditionalities and eco-schemes varies widely based on several factors, including geographic location, the specific crop being replaced, and the duration of implementation. This variability highlights the necessity for more detailed data on how different measures perform under various conditions. The CSP offered a strategic approach to policy design; however, it has not guaranteed the adoption of effective measures or significant impact. This situation reflects shortcomings in both the EU CAP framework and national implementation. The EU Commission's approval process for the Danish CSP did not facilitate an implementation of the CAP that significantly enhanced environmental improvements compared to the previous CAP.

The national Danish implementation has not set a high level of ambition for the CSP, especially given that 37 EUR million subsidised existing operations without fostering new advancements or enhancements in environmental management. This corresponds to 57 pct. of the total applied eco-scheme funds. In the new CAP reform the Danish implementation of the GAECs and eco-schemes has not provided effective tools to bring about significant climate action in the agriculture sector. The policy does not sufficiently address climate and environmental objectives in direct and measurable ways, and there are elements of competition as well as a lack of synergy between the green measures. This case seems not to be unique to Denmark as an assessment of the CAP strategic plans of four EU Member States concludes that "*Member States did not take the opportunity of using the increased flexibility to significantly increase support for environmental and climate action*".

### Effect on climate

The GAEC 8, and the two eco-schemes 'Biodiversity and sustainability' and 'Nutrient extensification of grassland' are reducing GHG-emissions through setting aside agricultural land as non-productive. This is both through reductions in fuel use as well as the absence of fertilisation and liming, which will result in reduced emissions of greenhouse gases, where the alternative scenario was arable grain production[17]. The eco-scheme 'Climate- and environmentally friendly grassland' has a potential climate effect through sequestration of carbon in the grassland soil, this is also compared to the same reference scenario. Table 4 illustrates the estimated climate effect of the four measures and is based on the implementation rates in 2023 and the non-additionality presented in the chapters regarding the different eco-schemes in this report. Relevant emissions factors[18] for the different measures are also utilised and a summary of the calculation methods is described in appendix 4.

Table 4. Lists the CAP measures which are expected to have a climate effect as well as the estimated effect for 2023. The estimates are calculated using data from the Danish Center for Food and Agriculture.

| CAP measure | Area covered by measure 2023 | | Total climate effect |
|---|---|---|---|
| | Total area [ha] | Area with additional effects [ha] | $CO_2e$ per year [million tonnes] |
| *GAEC 8 | 99,359 | 64,000 | 0.083 |
| *Eco-scheme Biodiversity and sustainability | 22,245 | 22,245 | 0.028 |
| Eco-scheme Nutrient extensification of grassland | 6,296 | 2,100 | 0.003 |
| Eco-scheme Climate- and environmentally friendly grassland | 174,727 | 99,000 | 0.01 |
| All measures | | | 0.13 |

*As 95 pct. of the area in 2023 was registered as fallow, values for fallow are used in the calculations.

In the Danish government's 2023 Climate program it is presented that the GAEC 8 and eco-schemes has a potential to reduce the GHG emissions from Danish agriculture with 0.38 million tonnes $CO_2e$ per year. However, this report estimates that the GAEC 8 and eco-schemes have reduced the GHG emissions with 0.13 million tonnes $CO_2e$ in 2023. In 2022 the emissions from the agricultural sector[19] was 12.8 million tonnes CO2e.

The difference between the estimate in the climate program and the estimate in this report is most likely due to the climate program assuming full uptake of the eco-schemes and higher levels of additionality.

17 To estimate effects of a measure, such as fallow, calculations are made comparing the measure to a reference situation of a Danish standard crop rotation.
18 The emissions factors are presented in this report.
19 Including emissions from agricultural processes, agricultural land use, forests and harvested wood products, energy consumption in agriculture, horticulture, forestry and fishing.

### Nitrogen effect

Denmark has committed to reducing the inputs of N to the aquatic environment with just over 13,000 tonnes approx. by 2027 as required by the water framework directive. In 2021, the normalised[20] leaching of nitrogen to the aquatic environment was 55.000 tonnes N according to national monitoring and in 2027 the goal is a maximum leaching of 42.000 tonnes N to the aquatic environment from agriculture.

The estimated reductions in nitrogen leaching from the implementation of the GAECs and the eco-schemes are calculated based on average values where the alternative scenario was arable grain conventional crop production. Thus, the effects of the measures will depend on the implementation, especially where the measures are located, and into which type of crop rotation.

The factor used to calculate reduction potential for nitrogen leaching to the aquatic environment from fallow land is 9.86 kg N per hectare per year, the same factors used in the Danish CSP. This has been used to calculate the effect of GEAC 8 and the eco-scheme 'Biodiversity and sustainability'. There is a slight difference for fallow, biotopes, and buffer zones but it is not significant for the estimated total effect, especially considering uncertainties in the estimated average values used. For the eco-scheme 'Nutrient extensification of grassland' the factor of 13.05 kg N per hectare per year reduction in leaching to the aquatic environment has been applied.

As no data was available for potential reduction in leaching to the aquatic environment of the eco-scheme 'Climate- and environmentally friendly grassland', a value was estimated based on the reference value of a 9.86 kg N per hectare per year reduction in leaching to the aquatic environment for fallow land[21].

Table 5. Estimated reductions in nitrogen leaching to the aquatic environment for 2023.

| CAP measure | Area covered by measure 2023 | | Potential reduction in nitrogen leaching to the aquatic environment | Estimated reduction in nitrogen leaching to the aquatic environment |
|---|---|---|---|---|
| | Total area [ha] | Area with additional effects [ha] | kg N/ha/year | tonnes N |
| [1]**GAEC 8** | 99,359 | 64,000 | 9.86 | 631 |
| [2]**Eco-scheme Biodiversity and sustainability** | 22,245 | 22,245 | 9.86 | 217 |
| **Eco-scheme Nutrient extensification of grassland** | 6,296 | 2,100 | 13.05 | 27 |
| **Eco-scheme Climate- and environmentally friendly grassland** | 174,727 | 99,000 | [2] 2.63 – 9.86 | 260 – 973 |
| **Total** | | | | 1,135 – 1,848 |

[1]As 95 pct. is fallow, the factor for nitrogen leaching reduction for fallow is used.
[2]As no reduction factor available to estimate nitrogen leaching to the aquatic environment these values were estimated based on the value for fallow found in the Danish CSP.
See appendix 4 for a detailed description of the calculation.

20 Leaching is highly influenced by the amount of precipitation and run-off. The normalised leaching takes weather related year-to-year variations influencing runoff into account.
21 See appendix 4 for a detailed description of the calculation.

As illustrated in table 5 there is an estimated total reduction in nitrogen leaching of 1,135 – 1,848 tonnes N, corresponding to 2 - 3 pct. reduction of the total N-leaching from land to sea in Denmark and 9 - 14 pct. of the 13,000 tonnes N reduction goal by 2027 stated in the Water Framework Directive.

The current data and existing average values for leaching are not sufficient to provide a clear picture of the effect and therefor CONCITO recommends that the government provide more detailed data on the effect of the different available measures to reduce nitrogen leaching to the aquatic environment, especially the variance in the effects depending on the specific implementation such as where they are placed, which crop they substitute and what the duration is.

**Effects on biodiversity**

Biodiversity are the primary targets of GAEC 8 and the eco-scheme 'Biodiversity and sustainability'. These measures have resulted in 86,000 ha of new non-productive area with the main goal of supporting biodiversity in the agricultural landscape. The evaluation of GAEC 8 and the eco-scheme in this report has revealed that 95 pct. of the non-productive area is classified as fallow and mainly mown fallow land. The expected positive effect on biodiversity is that fallow land does provide some resources for common farmland organisms, for example some farmland birds.

However, requirements to the fallow land in GAEC 8 and the eco-scheme are not aligned with recommendations by biodiversity experts, including the timing and frequency of mowing, the requirements for plant cover, and the duration of fallow, see appendix 3 for the list of recommendations to improve the biodiversity on fallow land. As short-term fallow potentially can have as much negative as positive impact on organisms in the agricultural landscape, the efforts in the current CAP implementations are highly insufficient to improve biodiversity in the agricultural landscape. The new incentive to increase the area with pollinator fallow land in 2024, in the eco-scheme is one step in the right direction, however still highly insufficient as it is a short-term initiative which does not incentives long-term action.

The most important principle for protecting and improving biodiversity in agricultural landscapes is first and foremost to preserve and protect existing small biotopes and other natural elements, as these semi-natural areas have a much higher biodiversity potential than new ones. It is therefore central to ensure that new biodiversity areas are not created at the expense of existing biotopes. One model, which would avoid this risk, is the Gross area model as originally proposed by Organic Denmark. The Gross area model has been implemented as part of the Danish CSP, however in a more complicated and restricted way than originally proposed and has therefore not resulted in any advantages for biodiversity yet.

CONCITO recommends establishing a baseline, goals and monitorable indicators for biodiversity in the agricultural landscape, which can be easily used by farmers and consultants. In that context, the government should both monitor and document the biodiversity effects of GEAC 8 and the eco-scheme 'Biodiversity and sustainability'. Biodiversity measures in the national CSP should be aligned with the EU Biodiversity strategy.

# 4. Economic aspects

In order to understand whether the implementation of the new CAP is achieving its intended objective of economic sustainability, it is essential to get an overview of its economic consequences and the overall economic state of agriculture in Denmark. This chapter provides information about the economic development of the agricultural sector as well as expected economic implications of the new CAP, with a specific focus on how the overall funds have been spent in the first year. Included in this section are highlights regarding how the new reform has impacted some specific sectors.

**Lower economic dependency on the CAP subsidy**

The agricultural sector receives a significant amount of public support in Denmark, for environmental subsidies, coupled support, tax deductions, research and innovation, education and administration, which amounts to roughly 2.102 million EUR in 2022 in total.

Statistic Denmark has estimated that the CAP support constituted 53 pct. of Danish farmers' operating income[22] between 2017 and 2021. This represents a significant reduction of 50 pct. compared to the period spanning 2012 to 2016 when CAP support comprised approximately 100 pct. of the operating income. Weather-related events can increase the dependence on funding.

76 pct. of the subsidies went to full-time farmers in 2021. There is a significant disparity in subsidy reliance between the smallest full-time businesses, characterised by one to three employees, and larger farms with 10 or more full-time employees. Subsidies constitute 74 pct. of the operating income for small farms, contrasting with larger farms, where subsidies contribute 35 pct. between 2017 and 2021. Economic productivity in 2023 was approx. 10 pct. higher than in the base year of 2005 and is expected to rise by 1 pct. in 2024. This indicates that Danish farms in general are becoming more financially sustainable and thereby less dependent on CAP funding.

**Economic redistribution within different sectors**

One of the major planned economic changes with the new reform, has been a redistribution of CAP funds through the removal of payment entitlements. With the new CAP, there has been a redistribution of around 268 million EUR. Funds were mainly removed, but also returned to the cattle, potato starch and sugar beet sectors. Changes in subsidies varied heavily depending on the commodities farms are producing. Farms that specialise in dairy production (- 18.6 pct.), starch potatoes (-14 pct.) or sugar beet (-13.8 pct.) have had a much stronger relative reduction in CAP funding than farms specialised in, for example, pork production (-5.7 pct.). Two new intermediary schemes have been implemented to provide coupled support for the dairy producers from 2023-2026 and starch potato producers from 2023-2027 to compensate the sectors for the redistribution of funds through the removal of payment entitlements.

22 The operating income is the amount that remains available for farmer's work effort and equity, after all costs, including financial expenses, have been paid.

**Less subsidies due to low uptake of eco-schemes**

For the application year 2023, the budget for the eco-schemes was 107 million EUR. However, as there was an implementation gap, due to low application rates, only 67 million EUR were used for the eco-schemes, corresponding to 60 pct. of the budget. Consequently 40 million EUR did not reach Danish farmers and therefore also had no environmental effect. The economic net effect of this implementation gap results in a relatively lower economic support for farmers compared to a scenario of higher implementation rates. The grain prices were high in 2023, see figure 14, which can partly explain the low uptake of eco-schemes.

How the average farmers' profits have been influenced across production branches is unclear, as this is also highly dependent on global market prices for both agricultural products as well as for inputs such as feed and fertiliser and will vary between the different sectors within agriculture.

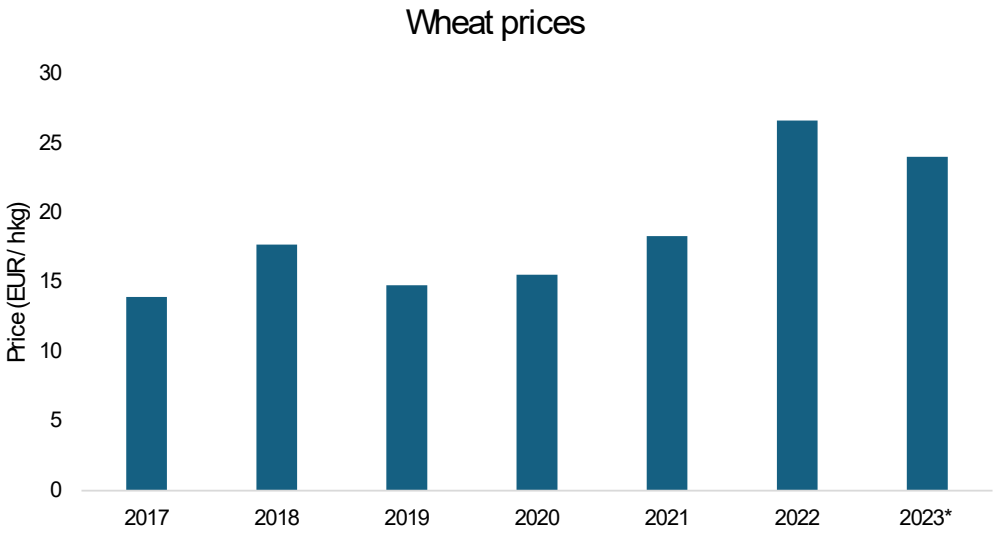



*Figure 14. The development in wheat prices from 2016 to 2023 show the average price for each year, in EUR per 100 kg, as well as the annual change in pct. Data for 2016 to 2022 is obtained from Statistics Denmark and data for 2023 marked with * in figure 15, is obtained from the industry via the following listing.*

What is clear however is that total debt of the agriculture sector has reduced by approx. 16 pct. from 2017 to 2022, see figure 15, and the trend is projected to continue in 2023 and 2024. This is mostly due to higher output prices.

**Reduced subsidies for the dairy sector**

The dairy sector is subjected to the highest relative reduction in subsidisation because of the new reform. There are two reasons for this, and the primary reason is the phase out of payment entitlements for the cattle sector from January 2023. SEGES has in an unpublished analysis estimated that the reform along with other changes to national regulation, will cost dairy producers an average loss of 24,000 EUR per year.

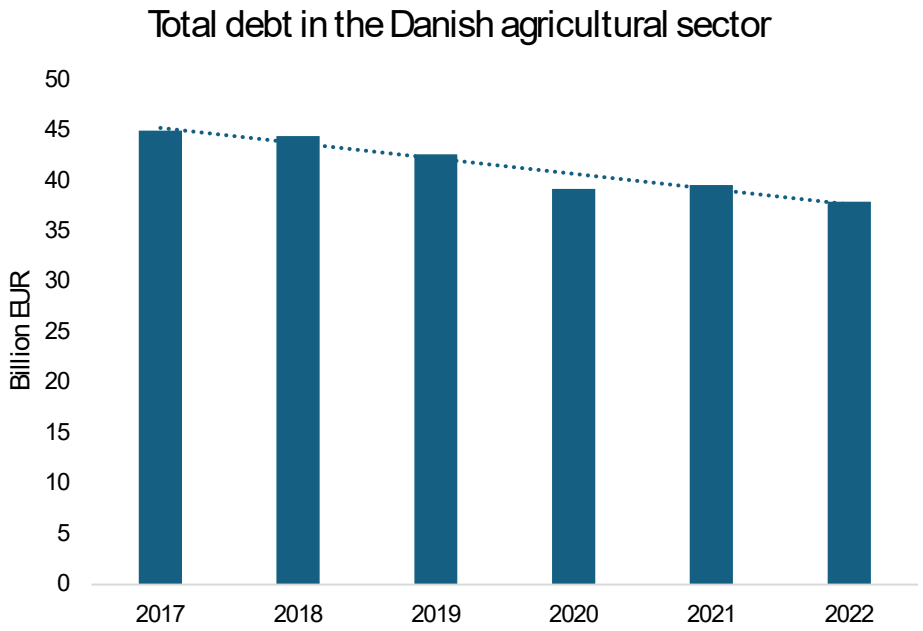



*Figure 15. Reduction in total debt in the agricultural sector in Denmark. The total debt includes mortgage loans, bank loans and other loans. Especially the bank debt has been reduced but the mortgage debt has also reduced as well as the interest expenditure. Data obtained through Statistic Denmark.*

The CAP reform itself is estimated to reduce subsidies to an average dairy producer by 12,000 EUR per year which is roughly 69 pct. more than the reform costs an average Danish farm. Furthermore it is estimated by SEGES that the prices on agricultural lands would decrease 10 pct. and therefore increase the risk of bankruptcy. It is worth noting though that output prices in particular for dairy farmers have turned out to be favourable during the new CAP period.

To compensate for the financial losses connected with the removal of the payment entitlements, a new type of coupled support is available for the years 2023-2026 called 'Cattle premium'. The Cattle Premium has a total pool of 28.5 million EUR which will be distributed with a linear decrease from 2023-2026. In addition, the purpose of the eco-scheme 'Climate and environmentally friendly' grassland is to compensate dairy farmers for financial losses. Furthermore, another type of coupled support, namely the 'Slaughter Premium', is maintained throughout the reform period with a pool of 32.8 million EUR annually. The pool was in 2020 increased with 8.7 million EUR and in 2023 the conditions have been changed, so that the weight limit was reduced from 160 kg to 130 kg, and the age of eligible heifers was increased from 16 to 30. This makes more animals eligible for the subsidy.

**Changes in subsidies for starch potato and sugar beet sectors**

The payment entitlements for the starch potato and sugar beet sectors are phased out with the new CAP reform. For the sugar beet sector there are no direct compensatory measures, however for the starch potato sector a new coupled support scheme is introduced and will be distributed with a linear decrease from 2023 to 2027. However, starch potatoes and sugar beets are included in the list of crops, which can receive support through the new eco-scheme 'Diversified plant production'. The subsidy rate in the eco-scheme is 82 EUR per ha.

The overall economic effects of the new CAP on the starch potato and sugar beet producers are not clear, as the new reform has both provided reduced financial support as well as new support opportunities via the eco-scheme and the coupled support. SEGES has estimated that the reform will cost the average starch potato producer 10,078 EUR per year and the average sugar beet producer 15,026 EUR per year.

**Land prices have increased**

Generally, there is increasing competition for land and conflicting interests in land-use from different sectors which influence the prices for land. Conflicting interests in land-use include land for agriculture and food purposes, biodiversity, urban expansion, infrastructure and energy such as for solar panels, and biomass production for energy. There is also an increasing trend of national and international investors purchasing Danish agricultural land. This results in an increasing demand for land which causes prices for land to increase, see figure 16.

While increasing land prices represents asset value growth, financial leverage, and potential income opportunity for the existing farmers, it can be a high burden for new entrants like young and those who want to expand their operation. High land prices are an indicator of a strong economy, but also a barrier for a green and social transition of the sector. Younger farmers are key to driving sustainable agricultural practices due to their openness to innovation, recent education, use of technology, engagement with supportive policies, and alignment with market and societal demands for sustainability.

Generally, the economy of the sector has strengthened over the last year[23], and this contributes considerably to the increased prices of agricultural land. From 2020, there has been a considerable increase in the price for agricultural land, which has continued into 2023. The projected decrease in price for agricultural land by SEGES has not been realised.

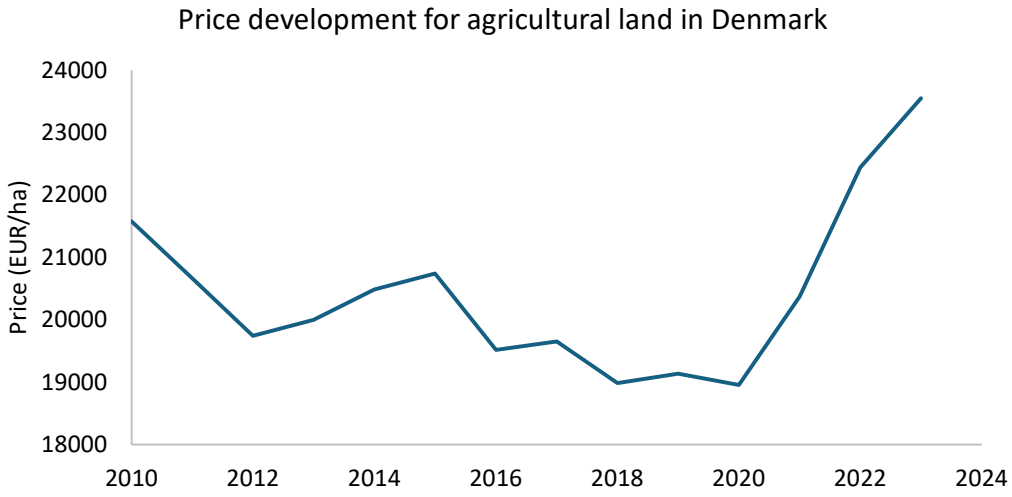



*Figure 16. Prices for agricultural land (holdings larger than 15 ha) in Denmark from 2010-2023. Data provided by Agrocura.*

23 Analysis provided by Agrocura, but not publicly available.

The new CAP has to some extent redistributed the subsidies, while economic productivity has improved, prices on land have increased and the debt has been reduced, indicating increased financial sustainability and reduced dependency on CAP funding. The redistribution has particularly affected the cattle, potato starch, and sugar beet sectors, however compensatory mechanisms such as the eco-schemes and coupled support, have been designed to offset the redistribution.

It is intriguing to note that a significant driver of the protests among many European farmers in 2024 is the fear of economic constraints potentially introduced by enhanced conditionality measures. Notably, the Danish agricultural sector has not only improved its financial standing but also stands out as one of the few countries to have fully implemented all the enhanced green conditionalities. While this does not establish a direct causality between enhanced green conditionality and economic development, it does illustrate that the greening of agriculture does not necessarily compromises economic growth.

# 5. Perspectives beyond the 2023-27 CAP

The CAP has changed significantly during its long history of around 40 years, and the overall changes have included decoupling of payments, environmental integration, market orientation, rural development, social inclusion and equity, flexibility and simplification as well as resilience and crisis response. Therefore the CAP has changed from a policy primarily focused on agricultural productivity and income support into a more complex and multifaceted policy that seeks to focus on economic, environmental, and social objectives, but where income support still remains the main objective.

**Previous changes to the CAP have not paved the way for delivering improvements on climate action and biodiversity in the agricultural sector**
The changes to the CAP have facilitated the policy becoming more dynamic to the challenges of modern agriculture, including global market pressures, climate change, and evolving public expectations regarding environmental stewardship and social equity.

However, as evident throughout the analysis of this report, the new CAP 2023-2027 does still not provide the necessary effects related to climate action, biodiversity or environment. This shortfall can be attributed to an overly flexible EU CAP framework that allows for unambitious implementation of the CAP by the Danish government, as outlined in Chapter 3. The European Commission, the European Parliament and Member States have all played a significant role in shaping the current CAP in regard to setting the level of ambitions and lacking the sufficient and effective funding of environmental and climate measures within the CAP budget.

The problems related to the CAP are also greater than the current framework and implementation of the CAP. Inherent to the CAP are structural issues which can explain the lack of ambition they are; insufficient environmental ambitions, complexity and inefficiency of implementation, limited funding for environmental measures, economic pressures and competing interests, fragmented policy approach, resistance to change as well as insufficient monitoring and enforcement.

**Multiannual Financial Framework set out the financial and strategic framework of the CAP**

The Multiannual Financial Framework (MFF) is critical for the development of the CAP because it sets the financial and strategic framework within which agricultural policies are designed and implemented. It influences the availability of resources, the prioritisation of goals, and the capacity for policy reform and integration, thereby shaping the CAP.

Even though it is still early to evaluate and conclude on the inefficiencies of this current new CAP reform, this analysis documents major challenges towards achieving significant environmental effects of the policy. Furthermore, the recent simplifications with the changes to the enhanced conditionality underline the lack of creativity and political will to find solutions, especially within the EU Commission. Solutions which are both good for farmers and for the environment.

The structural issues call for a new vision for EU agricultural policies and the MFF, which dares to think of new and innovative solutions. Discussions for the post-2027 CAP are already taking place, and the next CAP plan period 2028-2024 is pivotal, for tackling both climate change and biodiversity issues to meet EU's climate and biodiversity targets between 2030 and 2050. Therefore, this chapter will present a perspective on how a more structured reform of the next CAP could look as well as other policy options, which could ensure more climate action and improved biodiversity on agricultural land.

**Visions for a post-2027 CAP**

The vision for CAP 2028-2034, as presented in IEEP's policy paper 'Transforming EU land use and the CAP: a post-2024 vision', focuses on addressing sustainability challenges while assisting farmers and land managers in transitioning to sustainable and economically viable businesses. The vision involves providing more substantial transitional aid to help stakeholders meet new environmental requirements, adopt sustainable business models, and mitigate negative impacts from these transitions. The vision addresses the need for ongoing public financing to support the provision of environmental services and public goods, suggesting a shift in funding priorities towards more ambitious environmental and sustainability goals. This includes enhanced support for advice, training, and stakeholder engagement, which are crucial for helping land managers transition to sustainable practices.

The report also highlights the importance of continued investment in research and innovation to develop and deploy sustainable agricultural practices and technologies. The vision suggests a restructuring of the CAP's funding architecture, advocating for a redirection of funds from direct payments to a new Sustainable Land Management and Fair Transition Fund focused on sustainability objectives. This vision is an example of an innovative proposal of a reform of the CAP with a strong emphasis on sustainability and economic viability.

**A break down of the different steps**

Step one would be to phase out the support to the least climate friendly measures of the reform, like coupled support for ruminant animals and the direct payments for agricultural cultivation of organic soils. This should be communicated well in advance of the negotiations of the CAP post-2027 and the phase-in time can be targeted and adjusted according to predefined criteria. For instance, organic soils with more that 6 pct. of carbon and cattle can be phased out first whilst farmers that provide high nature value production systems last. While phasing out direct payments for organic soils pillar II funds could provide enhanced support to facilitate the rewetting of the soils.

The second step could be a broad restructuring of the direct payments and a phase down or phase out of direct payments. The vision suggests that a portion of the funds for direct payments should be redirected towards a new Sustainable Land Management and Fair Transition Fund. The fund should support environmental services, provide transition aid to the farmers in need, improve advice and training services to farmers, invest in research and development activities and encourage and support stakeholder engagement. A leaner version of the CAP is maintained alongside the new fund, focusing on a more targeted version of rural socio-economic support where needed, especially in relation to a transition period, see figure 17.

The tird step could be to change the governance structure of the CAP by establishing a new, more integrated governance framework aimed at better aligning national and regional policies with EU-wide sustainability targets. A central feature of the proposed governance reform is the strengthening of central coordination within the EU. This would ensure that environmental goals are consistently integrated across all levels of CAP implementation, fostering a unified approach to sustainability. By engaging environmental groups, farmers, scientific communities, and local authorities, the CAP can benefit from a wider range of perspectives and expertise, enhancing both the legitimacy and effectiveness of its policies.

The fourth step would be to significantly improve the monitoring and reporting mechanisms of the CAP. Enhanced monitoring would involve developing robust indicators of environmental performance, while improved reporting measures would ensure transparency in the use and impacts of CAP funds. This step is crucial for public accountability and for making informed adjustments to policies. The improved monitoring and reporting mechanisms should be linked with flexibility into the governance structure to allow for quick responses to emerging environmental challenges and new scientific insights. This adaptive approach would enable near real-time policy adjustments, ensuring that the CAP remains relevant and effective in the face of evolving challenges.

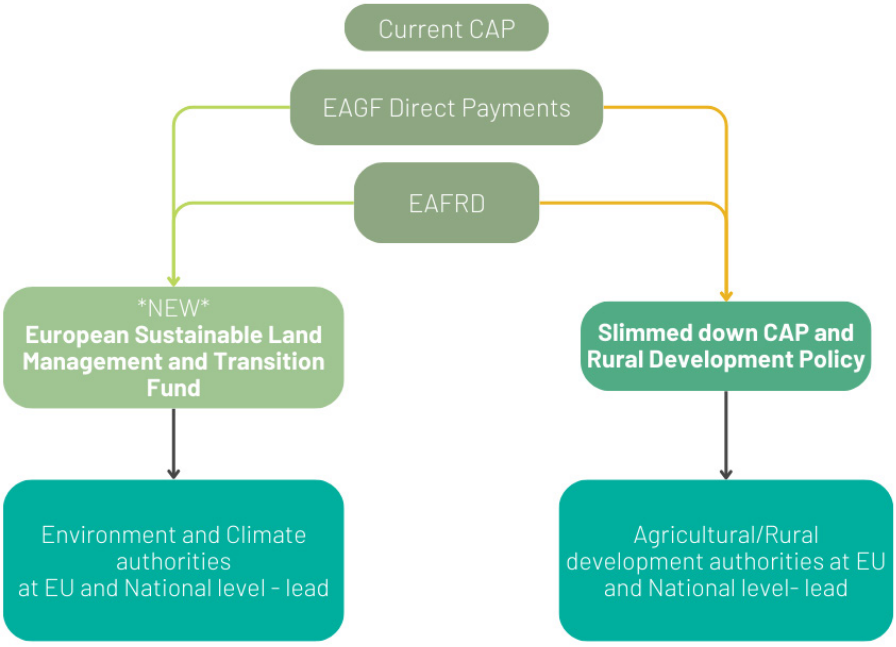



*Figure 17. Proposal for a post-2027 CAP governance structure. European Agricultural Guarantee Fund (EAGF) and European Agricultural Fund for Rural Development (EAFRD) are the current pillar I and pillar II funds respectively. Source: Transforming EU land use and the CAP: a post-2024 vision.*

**'Shocks' may be required to change the CAP**

The CAP is difficult to change due to entrenched political and economic interests that favour maintaining the status quo, especially the first pillar of CAP which involves direct payments to farmers. This lowers the political feasibility of more radical changes to the CAP, like the ones presented above.

Without significant external shocks, the likelihood of a substantive reform of the CAP is low due to the interests among key actors who benefit from the current system. However, potential scenarios could disrupt these interests and open a window for reform. These include major geopolitical or economic changes, like EU enlargement or environmental and animal health crises, which could shift the financial and political landscape sufficiently to move some of the major players in the next MFF negotiations on the CAP.

**Agricultural Emissions Trading System (AgETS) is a way forward**

As the CAP and the Effort Sharing Regulation have not demonstrated the ability to generate sufficient climate action in the agriculture sector in the EU, other policies should be considered. Currently, there is a lack of a robust financial incentive for farmers, and agriculture is currently the only sector in the EU not subject to the polluter-pays principle. In this light, the European Court of Auditors has recommended the EU Commission to assess the potential to apply the polluter-pays principle in agriculture, and the European Scientific Advisory Board and the European Investment Bank have recently recommended the introduction of some form of emissions pricing in the agricultural and land use sectors. The EU Commission commissioned a study on how to apply the principle in the agricultural sector, which put forth five policy options, all of which involved emissions trading (due to their legal feasibility).

An AgETS could provide better economic incentives to develop and implement reduction measures in the sector. Furthermore, it could ensure a level playing field and equal competition across the EU. The climate effects of an AgETS would need to be in the centre of the design and will be reliant on elements such as the regulated entities, setting of the emissions cap, sector coverage, mechanisms for improving the systems resilience etc.

An AgETS would ideally cover the most significant sources of agricultural emissions to be most effective. Monitoring, Reporting, and Verification (MRV) framework on farm level would need to be developed to ensure the effectiveness, and this could pose some challenges on EU level (e.g. due to data limitations and concerns about administrative burdens and costs). The system should also take into account farmers' opportunities to reduce emission and the risk of carbon leakage to countries outside the EU (e.g. by considering a Carbon Border Adjustment Mechanism).

**Ensuring coherence between the AgETS and the CAP is crucial**

An AgETS should be pursued in parallel and in a coherent manner with the CAP to avoid conflicting policy signals (e.g. both pricing GHG emissions and subsidising emissions-intensive agriculture). These possible policy inconsistencies could decrease, if the reform of the CAP takes into account a possible introduction of some kind of emissions trading in the future (e.g. by phasing out the coupled support for ruminant animals and the direct payments for agricultural cultivation of organic soils as mentioned above). In order to ensure a robust measuring on-farm emissions as precisely as possible, it should be considered either integrating a new conditionality for on-farm MRV of GHG emissions or developing separate MRV rules for on-farm emissions to prepare for an AgETS. To lower the administrative burden, threshold values should be considered and CAP resources could be used to help farmers with possible MRV-cost, training, and learning (e.g. through eco-schemes focusing on MRV).

Repurposing revenues from an AgETS towards climate action in the sector could yield significant climate effects. Some revenues from the AgETS could be used to support mitigation measures and help address the possible distributional impact on consumers and farmers (e.g. establishing a fund as the Social Climate Fund) and/or directed towards carbon removals and biodiversity efforts taken by farmers and foresters. Using the revenues generated from an AgETS to fund initiatives under the CAP has also been mentioned as one idea on how to link the CAP and the AgETS. However, this option risks diverting revenues into the broader agricultural objectives, which would dilute a more targeted use to a climate and environmentally sustainable food production in the EU (unless the revenues is e.g. more directly linked to a new Sustainable Land Management and Fair Transition Fund as mentioned above).

**AgETS and CAP as part of a broader policy mix**

An AgETS cannot stand alone and will not be able to achieve all sustainability concerns that emerge in agriculture. Problems related to biodiversity, animal welfare or freshwater availability cannot be directly regulated by emissions pricing in agriculture. A policy mix approach is needed to address a wide scope of challenges that the agriculture sector is facing and should be designed to enhance the effectiveness, efficiency, and equity of policy interventions by strategically combining different types of policy tools. Some of the policy areas which could be considered in the policy mix approach besides the CAP and the AgETS are regulatory measures such as sector regulation (such as the Industrial Emissions Directive), research and development support (for alternative meat and dairy products), trade policies (such as a carbon border adjustment mechanism (CBAM) or international trade agreements), fairer supply chain policies, as well as land use planning and management.

# 6. Conclusion

Despite the intentions to align with broader EU environmental and climate goals, the framework of the new CAP reform, developed by the EU-Commission, as well as the on the framework building up upon implementation of the Danish government, falls short in achieving substantial progress towards these objectives in Denmark. This analysis indicates that the conditionalities and eco-schemes have not led to significant improvement in climate action, biodiversity, or environmental sustainability. The effects are largely temporary and limited, primarily achieved through measures like short-term land set-asides rather than long-term measures which will support agricultural practices to be more sustainable.

The New Delivery Model sets a minimum level of ambition at the EU level; however, it does not result in significant additional environmental effects. Additionally, the Performance Monitoring and Evaluation Framework fails to provide an estimation of effects, which is crucial for a real evaluation of the plan's quality and for making necessary adjustments based on impact.

A weakness of the governance framework in the New Delivery Model is a tendency, or maybe even an incentive, to set low ambitions to avoid missing targets or to get a high uptake of the schemes to get the money out to the farmers and avoid budget cuts.

The report highlights the crucial need for ongoing evaluations and adjustments within the current CAP framework and suggests that a more profound reform will be necessary post-2027 to meet the EU's ambitious climate and biodiversity targets as part of a greater policy mix approach which could include an AgETS.

There is a need for a strategic long-term vision for the agriculture sector in the EU including the CAP that integrates more stringent, enforceable targets and promotes sustainable agricultural practices to ensure that the next CAP reforms provide the necessary contributions to environmental objectives.

The economy within the Danish agriculture sector did overall improve in 2023, even though Denmark also fully implemented all the GAECs and eco-schemes. This highly questions the necessity of removing GAEC 8, which the EU Commission suggested, as the EU is backsliding on the commitments to restore biodiversity, adapt to climate change and reduce GHG emissions.

# Appendix 1

Overview of key figures for the Danish eco-schemes in 2023 based on The Danish Strategic CAP-plan 2023-27 and a Review of selected figures for applications on the CAP funds in 2023 (DAA). The figures are rounded to whole numbers.

| Eco-scheme | Subsidy rate (EUR/ha) | Budget (million EUR) | Actual application (million EUR) | Actual application (hectares) | Actual application compared to budget (pct.) |
|---|---|---|---|---|---|
| Climate and environmentally friendly grassland | 201 | 39.9 | 5.2 | 174727 | 88 |
| Biodiversity and sustainability | 368 | 18.4 | 7.0 | 21065 | 38 |
| Diversified plant production | 83 | 15.6 | 12.5 | 151390 | 80 |
| Nutrient extensification of grassland | 473 | 18.0 | 3.0 | 6295 | 17 |
| Organic farming *Basic | 117 | 7.0 | 4.6 | 39226 | 66 |
| Organic farming *Add-on for conversion | 215 | 6.0 | 2.2 | 10089 | 37 |
| Organic farming *Add-on for fruit and berry | 537 | 0.3 | 0.2 | 322 | 65 |
| Organic farming *Add-on for reduced nitrogen supply | 87 | 2.0 | 1.3 | 14688 | 64 |
| Organic farming *Total | - | 15.2 | 8.2 | - | 54 |

# Appendix 2

Crops eligible for subsidies in the eco-scheme Diversified plant production, listed in the Guidelines on subsidies for Diversified Plant Production

| Crop code | Crop name | Crop category |
|---|---|---|
| 24 | Sunflower seeds | Sunflower seeds |
| 25 | Soybeans | Soybeans |
| 26 | Lentils | Lentils |
| 27 | Chickpeas | Chickpeas |
| 30 | Peas | Peas |
| 31 | Beans | Beans |
| 32 | Lupin | Lupin |
| 40 | Linen oil | Linen |
| 41 | Linseed | Linen |
| 42 | Hamp | Hamp |
| 52 | Quinoa | Quinoa |
| 53 | Buckwheat | Buckwheat |
| 122 | Caraway seeds | Caraway |
| 123 | Poppy seeds | Poppy |
| 124 | Spinach Seeds | Spinach |
| 125 | Beet seeds | Beet |
| 149 | Potatoes, seed (certified) | Potato |
| 150 | Potatoes, seed (own propagation) | Potato |
| 151 | Potatoes, starch | Potato |
| 152 | Potatoes, edible (packaging, road selling) | Potato |
| 154 | Potatoes, edible (process, peeled boiled) | Potato |
| 155 | Potatoes, powder/granulate | Potato |
| 156 | Potatoes, fried/chips/fries | Potato |
| 157 | Potatoes, edible- early harvested with cover crops | Potato |
| 160 | Sugar beets (for processing) | Beet |
| 161 | Chicory roots | Chicory |
| 180 | Yellow Mustard | Mustard |
| 215 | Pea seeds | Peas |
| 280 | Sugarbeets | Beet |
| 281 | Turnips | Cabbage |
| 282 | Fodder cabbage | Cabbage |
| 283 | Feed carrots | Carrots |
| 400 | Asian cucumber | Cucumber |
| 402 | Celery | Celery |
| 403 | Cauliflower | Cabbage |
| 404 | Broccoli | Cabbage |
| 405 | Courgette, squash | Pumpkin |
| 406 | Cabbage | Cabbage |
| 407 | Carrot | Carrot |
| 408 | White cabbage | Cabbage |

| | | |
|---|---|---|
| 409 | Napa cabbage | Cabbage |
| 410 | Celeriac | Celeriac |
| 411 | Onions | Onion |
| 412 | Parsnip | Parsnip |
| 413 | Root parsley | Parsley |
| 415 | Leek | Onion |
| 416 | Brussels Sprout | Cabbage |
| 417 | Red beet | Beet |
| 418 | Red cabbage | Cabbage |
| 420 | Salad (open air) | Salad |
| 421 | Kale, spring cabbage | Cabbage |
| 422 | Spinach | Spinach |
| 424 | Peas, consumption | Peas |
| 426 | Beans | Beans |
| 429 | Artichoke, consumption | Sunflower |
| 430 | Leaf parsley | Parsley |
| 431 | Chives | Onion |
| 432 | Herbs (except parsley and chives) | Vegetables and herbs |
| 434 | Vegetables, others (open air) | Vegetables and herbs |
| 450 | Vegetables, mixes | Vegetables and herbs |
| 510 | Melon | Melon |
| 513 | Strawberries | Strawberry |
| 540 | Tomatoes | Tomato |
| 541 | Cucumber | Cucumber |
| 542 | Salad (Greenhouse) | Salad |
| 543 | Vegetables, others (Greenhouse) | Vegetables and herbs |
| 551 | Butternut squash | Butternut squash |
| 552 | Zucchini | Zucchini |
| 553 | Cucurbita maxima | Cucurbita maxima |
| 651 | Dill Seeds | Dill |
| 652 | Napa cabbage seeds | Cabbage |
| 653 | Cress Seeds | Cress |
| 654 | Rucola Seeds | Rucola |
| 655 | Radish seeds | Radish |
| 656 | Leaf beet seeds, red beet seeds | Beet |
| 657 | Cabbage seeds | Cabbage |
| 658 | Carrot seeds | Carrot |
| 659 | Cabbage seeds (white- and red cabbage) | Cabbage |
| 660 | Parsley seeds | Parsley |
| 661 | Chervil seeds | Chervil |
| 662 | Turnip seeds | Ager cabbage |
| 663 | Parsnip seeds | Parsnip |
| 664 | Black salsify/black salsify seeds | Black salsify |
| 665 | Oat seeds | Oats |
| 666 | Chives seeds | Onion |
| 667 | Thyme seeds | Thyme |

# Appendix 3

Biodiversity recommendations for fallow land, found in the advisory report compared to the requirements of GAEC 8.

| | DCA Recommendations | GEAC 8 | Comments |
|---|---|---|---|
| **Timing of mowing** | Prohibit mowing between April 1st of to October 1st | Mowing prohibited between May 1st to July 31st<br><br>Spring mowing between April 1st to 30st<br><br>Summer mowing is between August 1st to September 25th. | Mowing during the winter months is recommended.<br><br>The bird fauna, as well as deer and hares, are particularly sensitive to mowing the plant cover during the breeding period, as well as in the early spring when the birds build nests. |
| **Frequency of and method for mowing** | Maximum once per year, preferably less<br><br>Dividing the field into subfields to leave undisturbed areas when mowing | Mandatory yearly mowing<br><br>No requirement of leaving undisturbed areas | Dividing the fallow field into two or more subfields will reduce the negative effects of mowing, as there will always be undisturbed areas in the field. |
| **Vegetation** | Establishing a plant cover of flowering herbs. Avoid cultivated grass. | No requirements to plant cover | The value for biodiversity is directly related to the quality of the plant cover, i.e. does it support the fauna with the right conditions and resources to complete its life cycle. |
| **Duration of fallow** | Fallow lasts a minimum of 5 years | 1-year commitment | The quality and biodiversity potential of a fallow area will increase over time, and therefore the duration of fallow is of key importance too. Increasing the time that an area is fallow has shown to improve both above- and below-ground biodiversity while a one-year fallow has limited positive effect on biodiversity.<br><br>In addition, short fallows could function as ecological traps and be harmful to the organisms which use the habitat, e.g. for overwintering when it is converted back to agricultural land. This is especially true for organisms like spiders and beetles which live just above the soil surface. |

# Appendix 4

**Climate effect**

Table 6 of this report illustrates the estimated climate effect of the four measures based on the implementation in 2023 and data from DCA report no. 220. The data used for calculations is briefly described below.

For GAEC 8 and the eco-scheme 'Biodiversity and sustainability', fertiliser associated emission reductions were calculated based on data from DCA report no. 220, which estimates a reduction of 837 kg CO2-eq/ha for fallow land with a nitrogen input of 0, where the alternative scenario was arable grain production as reference. The climate effect of saved fuel and liming was also calculated using data from DCA report no. 220 which estimates a reduction of 455 kg CO2-eq/ha.

There are different assessments and uncertainties around the potential of carbon sequestration when agricultural land is set aside as fallow. A DCA report from 2020 estimated a carbon sequestration of 1,100 kg CO2-eq per hectare for fallow land, whereas a DCA report from 2023 estimated an insignificant carbon sequestration for fallow land due to the short-term and non-permanence of the effects and to the lower input of biomass resulting from that non-productive areas are not fertilised.

Using the newest data available, carbon sequestration in unfertilized, fallow areas is in this assessment counted as an insignificant climate effect. The establishment of woody plants in non-productive areas would lead to significant carbon sequestration. However, as 95 pct. of the area which GAEC 8 and the eco-scheme 'Biodiversity and sustainability' has been applied to was registered as fallow, and less than 1 pct. as small biotopes, the calculations of climate effects for those two measures are based on values for fallow as any potential effects of carbon sequestration in small biotopes is insignificant on such a small area.

For the eco-scheme 'Climate- and environmentally friendly grassland' the effect is estimated based on the carbon sequestration effect of 110 kg $CO_2$e per ha per year. The additionality is estimated based on this paper for Aarhus University, which documents that 57 pct. of rotation grassland[24] already has a duration of three years. Furthermore, the same paper documents that 70 pct. of the permanent grassland has a duration which is longer than seven years. It is assumed that 50 pct. of the area covered in this eco-scheme is permanent grassland and 50 pct. is rotation grassland, as it more or less reflects the distribution of the total grassland, see figure 11. Therefore, the additional area for rotation grassland is approx. 38.000 ha and for permanent grassland it is 61.000 ha which in total is 99.000 ha.

For the eco-scheme 'Nutrient extensification of grassland', a level of non-additionality was introduced due to 65 pct. of the area, corresponding to 3900 hectares, being registered as arable grassland in **2022**. Thus, the reference situation for this area is grassland and not grain cultivation, which changes the estimation of any additional effects. For the 65 pct., or 3900 hectares, that was grassland in 2022, we assume a redistribution of the N-fertiliser allowance from the marginal soil covered by the eco-scheme to the more productive soil, which is common agricultural practice.

24 That grassland that is part of the crop rotation.

In the estimation, it is assumed that the allowed input for grassland with low productivity, namely 80 kg N per hectare, has been saved for the 3900 hectares in consideration. The fertiliser associated GHG emission reductions for the 3900 hectares were then calculated using the emission factors and methods of calculation put forward in DCA report no. 220. On the remaining 35 pct. of the area, 2100 hectares, the alternative scenario was arable grain production was used as a reference. This is the same value for fallow stated just above, and this was used to calculate the climate effect of setting the land aside as non-productive.

Table 6. Lists the CAP measures which are expected to lead to GHG emission reductions as well as the estimated reductions for 2023. The estimates are calculated using data from the Danish Center for Food and Agriculture.

| CAP measure | Area covered by measure 2023 | | Fertilizer associated emission reductions | [1]Other emission reductions | Carbon sequestration | Total climate effect |
|---|---|---|---|---|---|---|
| | Total area [ha] | [2]Area with additional effects [ha] | $CO_2e$ per year [million tonnes] | $CO_2e$ per year [million tonnes] | $CO_2e$ per year [million tonnes] | $CO_2e$ pe year [million tonnes] |
| [3]GAEC 8 | 99,359 | 64,000 | 0.054 | 0.029 | - | 0.083 |
| [3]Eco-scheme Biodiversity and sustainability | 22,245 | 22,245 | 0.018 | 0.01 | - | 0.028 |
| Eco-scheme Nutrient extensification of grassland | 6,296 | 2,100 | 0.002 | 0.001 | - | 0.003 |
| Eco-scheme Climate- and environmentally friendly grassland | 174,727 | 99,000 | - | - | 0.011 | 0.01 |
| All measures | | | 0.074 | 0.040 | 0.011 | 0.13 |

[1]Mainly associated with reductions in fuel use and liming.

[2]The total area which the measure covers where any estimated non-additionality has been deducted.

[3]As 95 pct. of the area I 2023 was registered as fallow, values for fallow are used in the calculations.

**Nitrogen effect**

The estimated reductions are calculated based on average values and the alternative scenario was arable grain production as reference, but the effects of each measure will have a large variance depending on factors like soil type, weather conditions, duration of the implementation and which crop the measure substitutes. Thus, the effects of the measures will depend on the implementation, especially where the measures are located, and into which type of crop rotation. According to the DCA report no. 220, the potential reduction in nitrogen leaching for fallow land is 41-58 kg N per hectare per year, and DAA lists a reference value of 9.86 kg N per hectare per year reduction leaching to the aquatic environment for fallow land in the Danish Strategic CAP-plan 2023-27. As 95 pct. of the area under GEAC 8 and the eco-scheme for 'Biodiversity and sustainability' is registered as fallow, the reference value for fallow is used, as the slight differences for fallow, biotopes, and buffer zones is not significant for the estimated total effect, especially considering uncertainties in the estimated average values used.

According to calculations by University of Aarhus reported in the Danish Strategic CAP-plan 2023-27, the potential reduction in nitrogen leaching for the eco-scheme 'Climate- and environmentally friendly grassland' is 12-45 kg N per hectare per year. As no reduction factor was available for potential reduction in leaching to the aquatic environment, a value was estimated based on the reference value of a 9.86 kg N per hectare per year reduction in leaching to the aquatic environment for fallow land. A reduction interval for leaching to the aquatic environment was estimated based on 12-45 kg N per hectare and amounts to 2.63-9.86 kg N per ha per year to the aquatic environment. The interval represents the uncertainty related to the geographical location of the grassland, the duration of grassland, the timing of ploughing, which crop grass substitutes and where it is placed in the crop rotation.

According to calculations by University of Aarhus reported in the Danish Strategic CAP-plan 2023-27, the potential reduction in nitrogen leaching for the eco-scheme 'Nutrient extensification of grassland' is 45 kg N per hectare per year and a 13.05 kg N per hectare per year reduction in leaching to the aquatic environment. This reference value was used for the 2,100 ha which was estimated as additional. See all the effect calculations in table 7.

Table 7. Estimated reductions in nitrogen leaching for 2023. The reduction factors for the potential nitrogen leaching reduction is obtained from the Danish Strategic CAP-plan 2023-27 for the eco-schemes 'Climate and environmentally friendly grassland' and 'Nutrient extensification of grassland'. The reduction factor for GAEC 8 and the eco-scheme 'Biodiversity and sustainability' is from the Danish Center for Food and Agriculture.

| CAP measure | Area covered by measure 2023 | | Potential reduction in nitrogen leaching to the aquatic environment. | Estimated reduction in nitrogen leaching to the aquatic environment. |
|---|---|---|---|---|
| | Total area [ha] | [1]Area with additional effects [ha] | kg N/ha/year | tonnes N |
| **[2]GAEC 8** | 99,359 | 64,000 | 9.86 | 631 |
| **[2]Eco-scheme Biodiversity and sustainability** | 22,245 | 22,245 | 9.86 | 217 |
| **Eco-scheme Nutrient extensification of grassland** | 6,296 | 2,100 | 13.05 | 27 |
| **Eco-scheme Climate- and environmentally friendly grassland** | 174,727 | 99,000 | [3] 2.63 – 9.86 | 260 – 973 |
| **Total** | | | | 1,135 – 1,848 |

[1] The total area which the measure covers where any estimated non-additionality has been deducted.

[2] As 95 pct. is fallow, the value in nitrogen leaching reduction for fallow is used.

[3]As no data was available these values were estimated based on the value for fallow found in the Danish CSP.

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