Agricultural Policy for Biodiversity: Facilitators and Barriers for Transformation

Sebastian Lakner, Christian Schleyer, Jenny Schmidt and Yves Zinngrebe

1. Introduction

The Common Agricultural Policy (CAP) is one of the largest agricultural policy systems worldwide (Pe'er et al. 2019), with a financial allocation of EUR 58.4 billion in 2019 (EC 2019) and a Producer Support Estimate of roughly EUR 90 billion, outpacing other major agricultural policies (e.g., in the USA (EUR 36 billion) or Japan (EUR 43 billion)) (OECD 2018) in absolute terms. The CAP objectives, first mentioned in the Treaty of Rome of 1957, focused on the increase in productivity, support of farm incomes, and market stability. However, with increasing awareness of environmental challenges and global commitments on biodiversity, climate change as well as desertification at the Earth Summit in Rio de Janeiro in 1992, environmental concerns have increasingly entered the CAP agenda. As the CAP has been reformed every five to seven years, it is reasonable to ask the extent to which reforms have resulted in a coherent policy producing effective and cost-effective outcomes.

This chapter looks at the advances towards this target using the frame of an idealized circular reform process (Figure 1), based on a policy action cycle (Parsons 1995; Zinngrebe 2016). By conducting a formalized evaluation prior to every CAP reform, it might be assumed that experience and a growing body of scientific and local knowledge lead to learning processes in the governance regime (Pahl-Wostl 2009).[1]

Sections 2–5 show and assess issues related to the dimensions of the policy cycle. One of the main questions of this chapter is to elaborate on the past and current status of the CAP and to indicate if the upcoming post-2020 CAP reform will be able to keep up with the challenges for the agricultural sector described in Section 2. In Section 3, we introduce the main CAP instruments supporting biodiversity objectives and give a brief overview on their performance in Section 4, focusing on the case of Germany.

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[1] Note that there is already an established evaluation process for the Rural Development Programs (RDP) in Pillar II, put in place since their inception in the Agenda 2000. While having the potential to substantially inform CAP reform at least in this area, the evaluation process itself and the limited uptake of its results have been critically discussed (Dwyer et al. 2008; Poláková et al. 2011).

We focus on policies, instruments, and measures, which aim to halt the biodiversity decline. In Section 6, we draw some conclusions and provide an outlook.

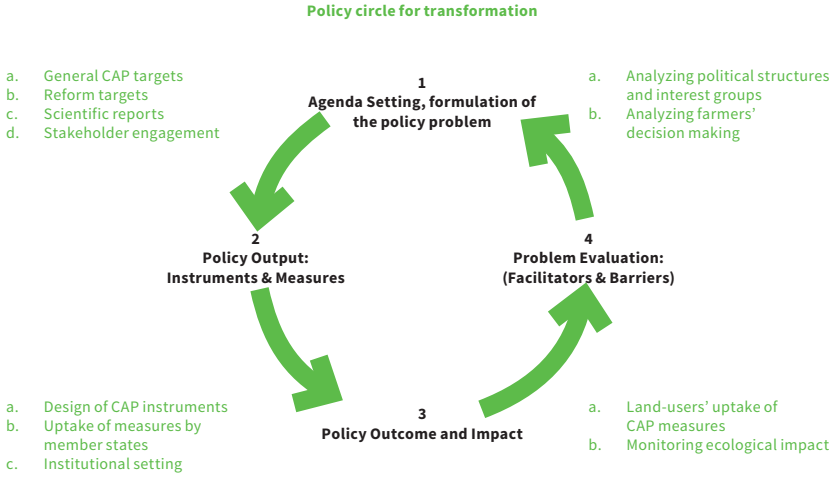

Figure 1. Policy cycle of the EU Common Agricultural Policy. Source: own presentation.

2. Agenda Setting: Formulation of the Policy Problem

Agenda setting for reforming the CAP is determined by a range of aspects, including environmental challenges relevant for and/or caused by agriculture and the uptake of both scientific knowledge and stakeholder and other societal preferences. As a result, targets set by the reformed CAP reflect these insights and, in particular, take into account relevant Sustainable Development Goals (SDG).

2.1. Environmental Challenges

The agricultural sector in Europe is facing a number of environmental challenges, which are already influencing farming practices and agricultural policies; and which will continue to influence the sectoral development and the political transformation of agriculture over the years to come. Most relevant challenges include the decline in farm biodiversity, climate change, and ground and surface water pollution with nitrates and pesticides. This is even more important since agricultural areas account for over 43% of Europe's total area (Eurostat 2020), thus affecting the remaining semi-natural and natural habitats.

Farm biodiversity in Europe and worldwide has been declining for decades (IPBES 2018). This has been illustrated recently in a study on Western Germany (Hallmann et al. 2017). Another study showed that arthropod species richness

declined by 34% over the last ten years, and their biomass and numbers declined by 67% and 78%, respectively (Seibold et al. 2019). Furthermore, a report of the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) pointed to land-use change as the most important driver for the decline in terrestrial and freshwater biodiversity worldwide (Díaz et al. 2019). Reports by the German National Academy of Sciences Leopoldina (Leopoldina 2018) and the German Advisory Council on the Environment (SRU and WBBGR 2018) have pointed to the urgent need to react to the decline. On a global scale, Beckmann et al. (2019) have shown that farm intensification is one of the major drivers of biodiversity decline.

The challenges for agriculture posed by climate change are twofold:

First, farms have to adapt to a changing climate. In 2018, for example, a long period of dry weather led to substantial losses in harvests: the yield for wheat declined by 16%, and for rapeseed (25%) and potatoes (26%) the declines were even larger (own calculations). Thus, the issue of adaptation to climate change already plays a major role for farms.

Second, the agricultural sector is a significant contributor to greenhouse gas (GHG) emissions. In Germany, roughly 12% of GHG emissions originate from agriculture and land-use change (UBA 2019). Consequently, the Intergovernmental Panel on Climate Change (IPCC) has pointed out the crucial role of land-use policies (Shukla et al. 2019). Here, the potential of restoring former wet grassland and peatlands and less-intensive forms of land use has been emphasized as being able to substantially reduce GHG emissions from agriculture in Germany (WBAE and WBFP 2016). On a global level, drained peatland takes a share of 1% of agricultural land, changing from a C-sink into a substantial source of GHG (Leifeld and Menichetti 2018). Rewetting peatlands, which have a share of 7% of the agricultural land in Germany, might reduce agricultural GHG emission by 37%. Yet, the implementation of such GHG-reducing strategies may impose high on-farm costs which could, however, be covered by agricultural policies (GMC 2019).

2.2. Scientific Input and Stakeholder Opinions Informing the Reform Process

In comparison to previous CAP reforms, the post-2020 CAP reform process is perceived to be more inclusive with respect to incorporating inputs from the public and evaluating the current CAP (2014–2020), yet still lacking sufficient structure and transparency. Key issues relate to the sequential order of reform elements in the preparation of the CAP proposal, and an unclear or even biased process in taking and processing inputs.

An in-depth evaluation of the current CAP period—the so-called 'fitness check'—has only been conducted many months after the first post-2020 CAP proposal had been published (June 2018) and negotiated in the Council and the EU Parliament (Pe'er et al. 2019). In turn, the new budget in the Multiannual Financial Framework (MFF) 2021–2027 was proposed in May 2018, prior to the publication of the CAP proposal, and thus, as in previous reforms, predetermined the process in advance by fixing, for example, the financial distribution between both pillars and options for potential improvements.

The process of public engagement for reforming the CAP included a public consultation, workshops and a stakeholder conference, and an Impact Assessment (IA). The public consultation process started in early 2017 with a 12-week Online Consultation by the European Commission (EC) to obtain public opinion—in particular, from farmers, citizens, organizations, and other interested parties—on how to modernize and simplify the CAP (Pe'er et al. 2019, SM, p. 46). However, respondents (total: 322,916)[2] represented only a very small (less than 0.01%) and non-random subset of the EU's population (e.g., 45.6% from Germany vs. 6.7% from new Member States (MSs)) who actively chose to participate after being invited. About half of the respondents identified themselves as being associated with farming or forestry. For them, the most pressing challenge of the CAP was ensuring a 'fair standard of living for farmers' (32%). For all others respondents, 'pressures on the environment and on natural resources' were perceived as most important challenge (ECORYS 2017). However, there are methodological concerns (e.g., biased, closed-ended questions often left unanswered) and the raw results have not been made available.

In preparation for the reform, the European Commission (EC) organized a series of workshops as well as a Stakeholder Conference in July 2017. However, the workshops to inform the reform and to prepare the Impact Assessment were organized internally by the EC's Directorate-General for Agriculture and Rural Development (DG AGRI) and it is not clear how participants were selected. Key organizations, such as environmental NGOs and scientific organizations, were not invited to some of these workshops and the conference, while farmer organizations were over-represented. Furthermore, no minutes of the conference were made public.

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[2] This number includes responses coming from large public campaigns. Only 63,027 responses came from individuals (ECORYS 2017).

As in previous CAP reforms, the EC conducted an Impact Assessment. However, the underlying processes were neither transparent nor inclusive. For example, relevant and important research work, such as the 'fitness check' outcomes of a comprehensive independent literature review (Pe'er et al. 2017b), were largely ignored and the results of the EU Joint Research Centre's (JRC) modelling that were used were not made public. Altogether, it is unclear how different sources of evidence, and types of contribution, were used to develop the proposed post-2020 CAP.

2.3. Reforming CAP Targets vs. Maintaining 'Old' CAP Structure

The original objectives of the CAP formulated in the Treaty of Rome 1957 and repeated in Article 39 of the Treaty of Lisbon 2009—increasing agricultural productivity, ensuring a fair standard of living for the agricultural community, stabilizing markets, assuring the availability of supplies, and ensuring that supplies reach consumers at reasonable prices—are largely insufficient and poorly reflect current European challenges with respect to climate change, nature conservation, and other sustainability issues (Pe'er et al. 2019). Others have already been fulfilled, such as ensuring food security at the European level. Thus, rather than stimulating higher agricultural productivity, the current challenge is to balance productivity with other objectives (Tangermann 2011). On the other hand, uneven distribution of Direct Payments (DPs) among farm size classes as well as among MSs suggests that the CAP instruments in general, and DPs in particular, have failed to reduce disparities and achieve a fair standard of living, and are inefficient in meeting farmers' needs (Deppermann et al. 2016). The chosen instruments do not sufficiently contribute to the targets. Conversely, environmental issues, rural vitality, and inequalities among EU regions are not listed in the original objectives.

During the reform process, sustainability narratives became more prominent; however, whenever it came to budget decisions, 'productivistic' and neo-liberal narratives were rather decisive (Erjavec and Erjavec 2015). The CAP reforms seem to follow a predetermined path, which conflicts with the majority of public inputs, compelling evidence, and published responses on the initial CAP proposal. For example, the 2017 Public Consultation indicates that both farmers and the public perceive the environment-related components of the Rural Development Programmes (RDPs) for public goods as the best instrument to address current challenges (Figure 2), whereas, in the proposed post-2020 CAP, most funding still goes to DPs.

Furthermore, the CAP has little focus on most of the 12 Sustainable Development Goals (SDGs)—ratified by the EC in 2015—relevant for agriculture, including SDG 2 Zero Hunger, SDG 15 Life on Land, SDG 6 Clean Water and Sanitation, SDG 8 Decent

Work and Economic Growth, and SDG 10 Reduced Inequalities (Pe'er et al. 2017b, 2019; Scown et al. 2020). So far, the CAP only substantially contributes to SDG 2 Zero Hunger and SDG 1 No Poverty, in particular through both DPs and RDP payments (ibid.). Yet, both SDGs are not key (anymore) in a European context. Some positive local impacts of some of the environment-targeted CAP instruments such as Agri-Environmental and Climate Measures (AECMs) and Cross Compliance (CC) have been noted with respect to SDG 6 Clean Water and Sanitation and SD 15 Life on Land. However, their budget and extent are too limited to reverse overall trends of environmental degradation and biodiversity loss; and some CAP instruments, such as DPs may have even speeded up the biodiversity decline (Pe'er et al. 2017b). Other crucial agriculture-related SDGs, where various CAP instruments could play an important role, are not—or hardly—addressed, including SDG 12 Sustainable Consumption and Production and SDG 11 Sustainable Cities and Communities. At the same time, several objectives are conflicting with each other and therefore give no clear guidance on how to achieve more sustainable agriculture (Pe'er et al. 2019).

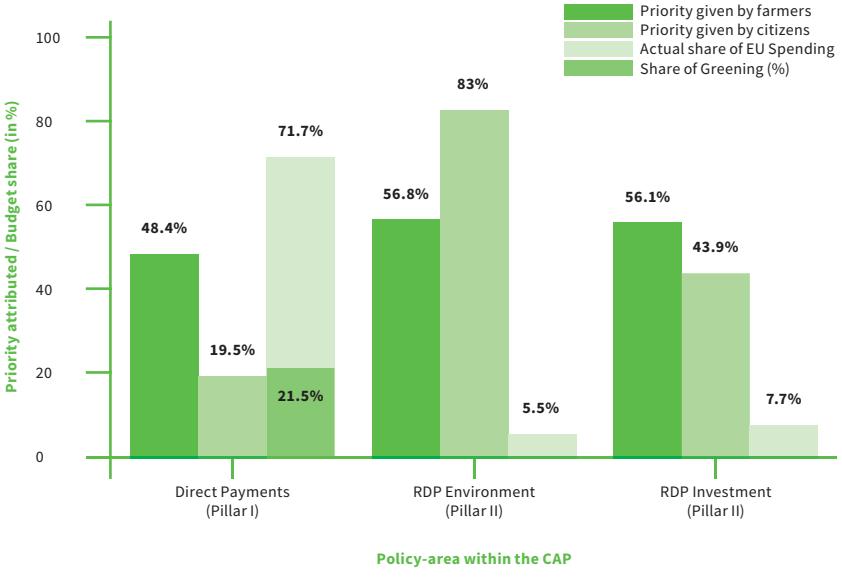

Figure 2. Perceived priorities by farmers and citizens and actual Common Agricultural Policy (CAP) spending. Source: Pe'er et al. (2017b).

3. Policy Output: CAP and Other Policies Relevant for Biodiversity

Apart from instruments and measures directly related to the CAP, in particular Agri-Environmental Programs (AEPs) (today: AECM, CC, and Greening of DPs),

there is a wide range of environmental policies which affect agricultural land use, farming systems, and biodiversity. These include the Birds Directive, the Habitat Directive (both building the Natura 2000-network), the Nitrates Directive, the Organic Production Regulation, and the Water Framework Directive (Table 1).

Table 1. A history of environmental policies relevant for agriculture in the EU.

Year	Legal Framework	Main Governance or Policy Level
1975	Less Favored Areas Directive (75/268/EEC); Payments for farming in less productive regions. Today: Areas of Natural Constraints (ANC)	CAP
1979	Birds Directive (79/409/EEC). Today: Natura 2000-network	EU/national
1985	Structural Policy: Special Aids for Environmental Sensitive Areas. Payments for environmental extensification. Today: Agri-Environmental and Climate Measures (AECM) as part of the EU extensification program according to EU-Regulation 4115/88	CAP
1991	Nitrates Directive (91/676/EEC). Organic Production Regulation (2092/91/EEC).	EU/national
1991	Regulation on pesticides use and placing of plant protection products on the market (Regulation 91/414/EEC; 396/2005; 1107/2009).	EU
1992	Habitat Directive (92/43/EEC). Today: Natura 2000-network	EU/national
1992	1./2. Agri-Environmental Programs (AEP) (2078/92/EEC and 1257/1999/EEC). Today: Agri-Environmental and Climate Measures (AECM)	CAP
2000	Water Framework Directive (2000/60/EC).	EU/national
2005	Fischler Reform: Cross Compliance for Direct Payments (GAEC). European Agricultural Fund for Rural Development (EAFRD) (1698/2005/EC).	CAP
2013	Greening of Direct Payments (1307/2013/EC, Art. 43).	CAP

Source: own presentation, based on Hill (2012, 190f.).

The evolution of AEPs within the CAP has its origins in the 1970s, with a substantial development after 1992 when the first AEPs were introduced. Reacting to a fundamental crisis during the 1980s and international pressures, the EU set-up a series of policy reforms, starting in 1992 with the so-called MacSharry Reform. In this and subsequent reform(s), environmental targets and measures were introduced to the CAP-framework. This includes the so-called 'accompanying measures' in 1992 with the EU Regulation 2078/1992 and 1257/1999 (Osterburg and Stratmann 2002), which were later on consolidated as AEPs in the Agenda 2000 Reform. After the Fischler Reform 2005, AEPs were financed through the European Agricultural Fund for Rural Development (EAFRD) (EU-Regulation 1698/2005).

The Agenda 2000 also introduced the two-pillar system: Pillar I includes DPs and market measures. DPs were then granted for production and are currently linked to the farmed area. Pillar II consists of the rural development policies including the AEPs, but also investment programs and rural development such as village renovation or the LEADER initiatives. Linking environmental standards to DPs via CC was introduced as principle with the Agenda 2000 and extended in the Fischler Reform 2005. As another step in this direction, compulsory Greening measures were introduced in the 2013 Reform now linking 30% of DPs to three sets of measures: crop diversification, maintenance of permanent pastures, and Ecological Focus Areas (EFAs). With the reform of 2013, the climate topic was added to the AEPs, now called Agri-Environmental and Climate Measures (AECMs).

Yet, although environmental sustainability narratives gained importance throughout the reform-path of the last 30 years, the designated financial funds remained small (Erjavec and Erjavec 2015). Though fluctuating significantly over the last twenty years, the share of AEPs within the CAP never exceeded 6% (Figure 3). In the current financial period (2014–2020), the AECM spending even slightly decreased by 8.6% compared to 2007–2013 (Pe'er et al. 2017b). Furthermore, 60% of the CAP-budget is still spent on the farm income target, yet failing to reduce disparities between and within MSs and thereby to achieve a fair standard of living (Pe'er et al. 2017b, 2019; Scown et al. 2020). Adding to this, AEPs still have the potential to be improved in terms of effectiveness and efficiency (Batáry et al. 2015).

During the 1990s, the expenditure on AECMs increased (Osterburg and Stratmann 2002), but it stagnated until 2008 due to the Eastern Enlargement of the EU and an increasingly broader scope of Pillar II. Figure 3 shows that the budget-share of AEPs has been varying between 2.3% and 6%, with the dips 2007 and 2015 being mainly due to the switch between program periods, i.e., fading out payments in the 'old' program and still only low expenditures in the 'new' scheme:

In the current CAP (2014–2020), there are three main instruments targeting environmental aspects of agricultural production, which are introduced and discussed in the following: Agri-Environmental and Climate Measures (AECMs), Cross Compliance (CC), and Greening of Direct Payments.

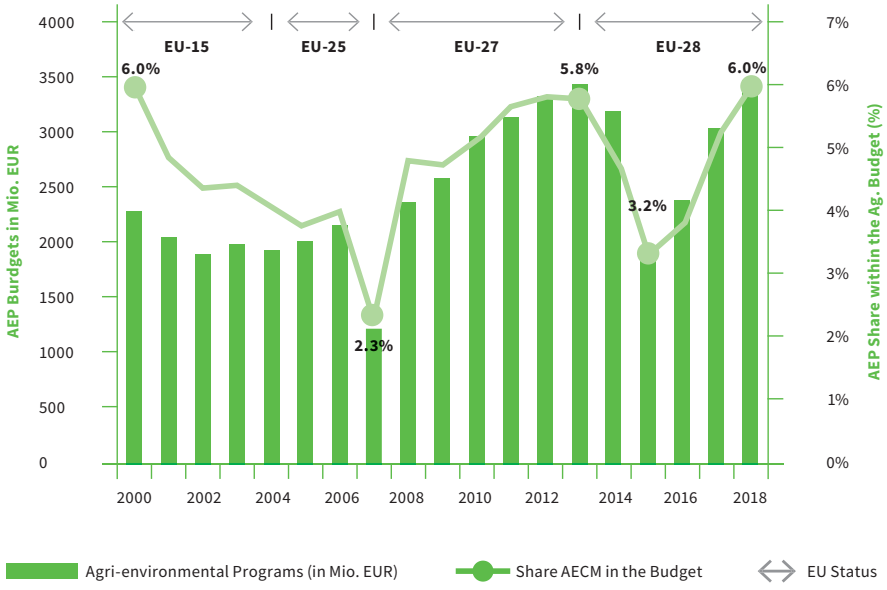

Figure 3. Amount and share of Agri-Environmental Programs in the EU 2000–2018. Source: own calculations; Data from German Federal Ministry of Food and Agriculture (BMEL 2000–2018); div. issues. Values are in Mio. EUR; Note the changing number of EU Members States 2000–2003 EU-15; 2004–2006 EU-25; 2007–2012 EU-27; 2013 ff. EU-28.

3.1. Agri-Environmental and Climate Measures

AECMs are the oldest and most developed environmental instrument within the CAP. Figure 4 displays the specific collaboration in financing and programming between the EU, the national government and, as an example, the federal states of Germany.

The AECMs are jointly financed by the EU and the MSs and formulated and implemented by the MSs or the regions/federal states as part of RDPs. The EU provides the general legal framework (EU regulation 1305/2013), and MSs design and implement the programs. In most cases, the MSs develop national RDPs and the respective AECMs; in some MSs, the regions (France, Spain, and Italy) or the federal

states (Germany) are responsible for this. In Germany, the national government offers a co-funding tool (Joint Task for Improvement of Agricultural Structures and Coastal Protection—GAK), adding up to 60% of the costs of the AECMs. The system of co-funding is explained in Figure 4.

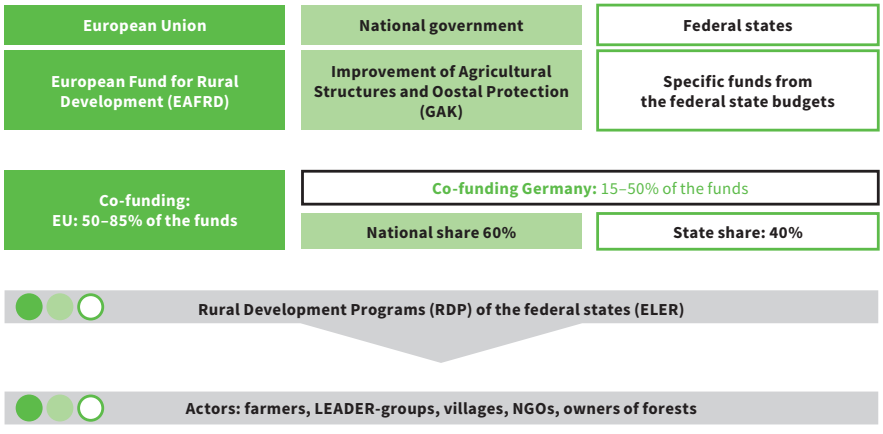

Figure 4. The system of programming and co-funding in Rural Development Programs, using the example of Germany. Source: own presentation.

AECMs are voluntary measures (see Figure 5 for some examples), which remunerate the income forgone for environmental actions that go beyond the CC standard (Section 3.2) and the Greening requirements of Pillar II (Section 3.3). The main approach is to compensate farmers for services as either producing a positive environmental outcome or avoiding a negative externality.

There are different types of AECMs:

- Most AECMs are area based, where farmers carry out a certain measure on a specific plot, whereas the rest of the farmland remains unaffected. Another approach is to support measures on the whole-farm level, for example, if an entire farm switches to organic farming.
- AECMs can target different types of land: arable land, grassland, other farmed land (e.g., permanent crops, horticulture, orchards, wine), and 'non-productive land' (e.g., landscape elements like hedges).
- AECMs differ in terms of their objectives: biotic (e.g., targeting biodiversity), abiotic (e.g., protection of surface waters through buffer strips near rivers and groundwater through less/no fertilizer use in groundwater protection areas) or mitigating climate effects (e.g., through rewetting peatlands).

- While most AECMs are based on concrete farmers' practices, which are assumed to have a positive environmental effect, in the last financial period (2014–2020), the range of available result-based measures has been extended. Here, farmers receive different levels of payments depending on, for example, the number of different endangered species (e.g., four, six or eight) found on their grassland. This approach is often perceived as providing more positive incentives for farmers since it allows them to choose the specific farming activities to increase the environmental 'output' flexibly, yet costs for implementing and monitoring may be higher (Schroeder et al. 2013).
- While some AECMs support specific farming practices (e.g., mowing grassland only after specific dates or establishing flowering strips) other measures limit the use of specified inputs (e.g., chemical fertilizers or pesticides) on certain plots.

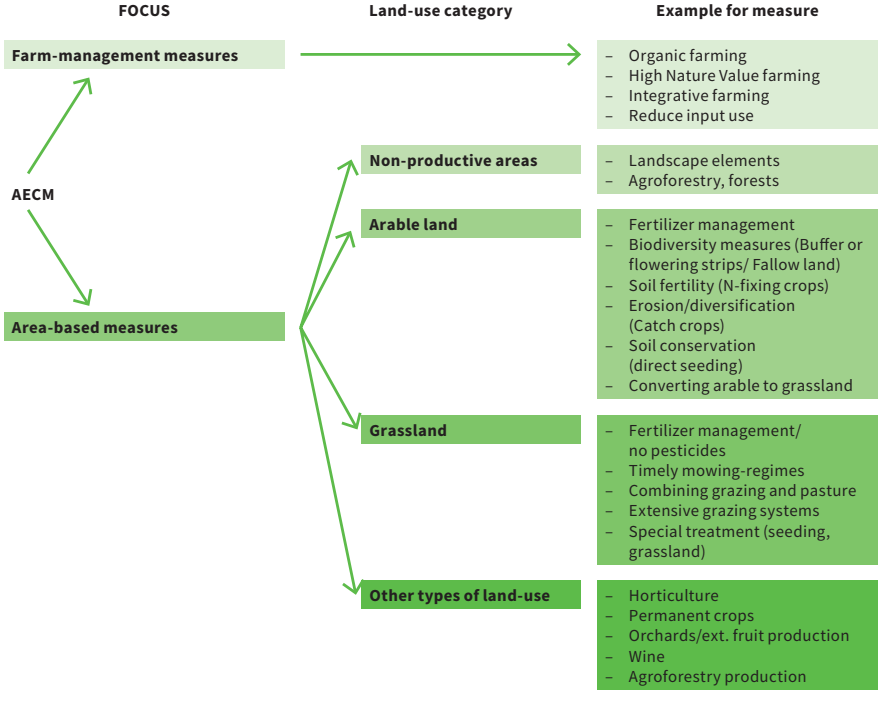

Figure 5. Examples of Agri-Environmental and Climate Measures. Source: own presentation.

The fact that MSs or even regional administrations program their own AECMs leads to a substantial heterogeneity with respect to the range and choice of measures

offered and the premium levels. This is due to (a) heterogeneous opportunity costs, (b) different budgetary capacities, (c) high administrative costs (e.g., designing schemes, monitoring, and sanctioning) for which MSs have diverging capacities (personnel, financial budget) to manage, (d) national and/or regional political priorities, and (e) the specific needs of the regional agro-ecosystem. Figure 6 shows the divergence in expenditure per hectare for AECMs across MSs.

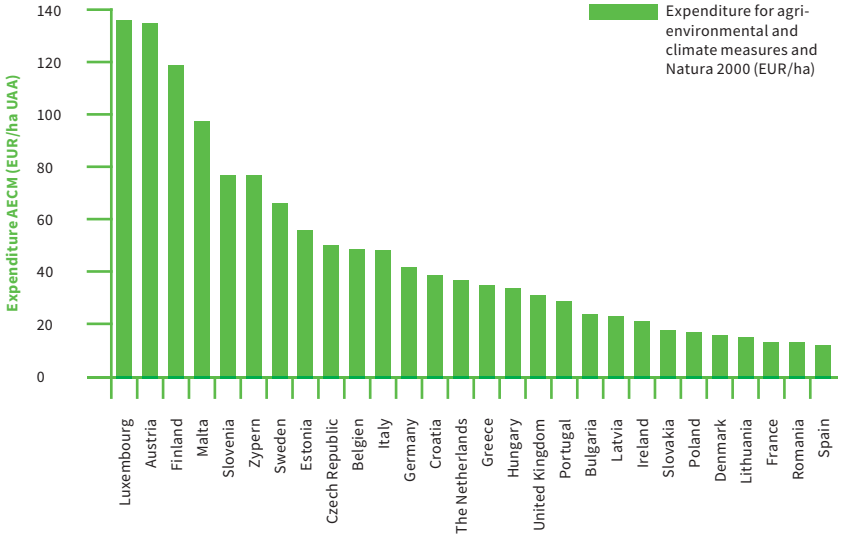

Figure 6. Expenditure for Agri-Environmental and Climate Measures 2014–2020. Source: own calculations, based on EU factsheets Rural Development (EC 2016). Figures include support of organic farms and payments for Natura 2000 areas. Payments for Areas with Natural Constraints (ANC) are not included.

3.2. Cross Compliance (CC)

Cross-Compliance (CC), introduced in 2000, links DPs of Pillar I with environmental objectives, regulations, and good practices for farming and animal husbandry, and food safety (BMEL 2015). The EU sets guidelines that are specified by the MSs (Juntti 2012). As DPs are usually too attractive to forgo, CC is seen as a "de-facto statutory law" (Nitsch and Osterburg 2004, p. 173). Farmers have to comply with Statutory Management Requirements (SMR), for example, avoiding agricultural practices polluting groundwater and to ensure Good Agricultural and Environmental Conditions (GAEC) of their farmed area, like preventing soil erosion and avoiding the deterioration of habitats (Juntti 2012). These standards and regulations were reinforced by CC through a standardized monitoring/control mechanism on 5%

of farms and the possibility to withhold payments if not adhered to; the amount withheld depending on the violation. This way, these standards become effective also in areas with very good *conditions* for agriculture where AEPs/AECMs are usually not applied.

The European Court of Auditors (ECA) 2008 criticized the implementation of CC as not sufficiently effective, as its objectives and the scope were not well defined, and therefore rules were not translated into controllable requirements at the farm level (ECA 2008). To help farmers comply with CC regulations, a Farm Advisory System within the MSs became mandatory in 2007 (Knuth et al. 2018).

As "[t]he use of interconnected resources results in unintended external effects" (Meyer et al. 2014, p. 187), ownership (as the right to use, manage, and gain income from) is linked to certain rights and duties that are subject to (state) authority (Meyer et al. 2014).

3.3. Greening of Direct Payments

The *Greening* of DPs was introduced in 2013 as a means to further deepen the CC standards (Meyer et al. 2014). It aims at 'enhancing the environmental performance' of agriculture by framing 30% of DPs as 'payments beneficial for climate and environment', granted only to farmers who comply with all three greening requirements (EC 2013, verbatim, recital 37).

Crop diversification requires, for farms with more than 30 ha of arable land, the cultivation of at least three different crops, of which the first crop shall not exceed 75%, and the first two crops not 95% of the arable land, respectively. For farms with 10–30 ha of arable land, a minimum of two crops is required, of which the first shall not exceed 75%. Farms with less than 10 ha of arable land, or with a high share of fodder crops on arable land, or a high share of grassland, are exempted (BMEL 2015, p. 37 ff.).

Maintenance of permanent grassland is aiming at protecting environmentally sensitive grassland (e.g., in Nature 2000 areas), which must not be converted to arable land. Conversion of permanent grassland to arable land shall not exceed 5% of the total permanent grassland in a region. Thus, conversion of permanent grassland (>5 years) has to be approved by local authorities (BMEL 2015, p. 42).

Farmers have to provide Ecological Focus Areas (EFA) on 5% of their arable land. They can choose between different EFA options, each related to weighting factors (WF) reflecting the respective ecological impacts. For example, a farmer can register 1.0 ha fallow land (WF = 1.0) equivalent to 3.3 ha of catch crops (WF = 0.3) or 0.5 ha of hedges as landscape elements (WF = 2.0) (BMEL 2015). MSs can pre-select

different EFA options, which are then nationally implemented. The choices within MSs are quite diverse; however, especially large MSs provide a broad set of EFA options, whereas small MSs are rather offering few EFA options (Table 2).

Table 2. Number of Ecological Focus Area (EFA)-options implemented in the different EU Member States 2015.

	Number of EFA Options Offered			
	2–4	**5–9**	**10–14**	**15 and More**
Number of MSs	**5**	**9**	**9**	**5**
	AT, FI, LT, NL, SI, ES	CY, DK, EE, EL, LV, MT, PT, SV, UK	BE, BG, HR, CZ, IE, LU, RO, SK	IT DE, FR, HU, PL

Source: own elaboration, based on data from EC (2015: 24) and Pe'er et al. (2017b).

The specific objective of the EFAs was outlined by the EC as to "safeguard and improve biodiversity on farms" (EC 2013, recital 44). While most EFA options are indeed listed as directly affecting biodiversity, the EC admits that catch crops and green cover only do this indirectly. However, any approaches testing the effectiveness of EFAs need to consider specifically their contribution to safeguarding and improving farm biodiversity. With respect to the effects of EFAs on a broader set of ecosystem services, however, some authors come to a more positive assessment (Hauck et al. 2014; Lakner 2018).

Organic farming systems are excluded from the obligation to comply with the Greening criteria (EC 2013). Greening is obligatory. However, in case of non-compliance, about 30% of the DPs can be cut. Consequently, empirical data for Germany in the year 2017, for example, shows that 284.678 farmers did apply for DPs, and only 132 farmers (0.6%) did not receive any Greening-payments, meaning that substantial sanctions lead to zero Greening-payments for these farms (BMEL 2017). Overall, it seems that Greening includes a rather low risk of receiving the maximum level of sanctions.

3.4. Other Policies Protecting and Fostering Biodiversity

Besides the CAP, there are policies from other policy fields also influencing land-use decisions and the maintenance and protection of biodiversity. Here, the so-called Natura 2000-strategy comprising of the Birds Directive (1979) and the Habitat Directive (1991) is the most important; however, pesticide regulations and Water Framework Directive (WFD) also haven influence on biodiversity (see Table 1).

The Birds Directive concentrates on the protection of a list of bird species of European importance. Most of these birds are migratory birds, and the Birds Directive attempts to protect their habitats for nesting and feeding. The Habitat Directive focuses on a number of specific habitats and plant and animal species of European importance, where the MSs have to maintain their 'favourable statuses'. Both Directives are the legal backbone of Natura 2000: a network of sites selected to ensure the long-term survival of Europe's most valuable and threatened species and habitats. Significant parts of this network are supported by AECMs.

There is also a link between the CAP and the EU Water Framework Directive. Introduced in the year 2000, the WFD requires MSs to achieve good qualitative and quantitative status for all water bodies. There is a high coherence in terms of objectives, and some CAP instruments can contribute to the implementation of the WFD: Cross Compliance, statutory management requirements, good agricultural and environmental conditions, and rural development measures. Another relevant water-related EU policy is the EU Nitrates Directive. As part of CC, it does effectively contribute to the reduction in nitrogen fertilizer use across most MSs, influencing not only land-use decisions but also livestock densities. Adding to this, the Regulation on Pesticide Use and the Regulation on Placing of Plant Protection Products on the Market still of 1991 and later years has an impact on the environment and specifically on biodiversity (EC 1991, 2005, 2009).

3.5. Harmful Subsidies within the CAP

Harmful subsidies are subsidies with side-effects on the environment (SCNAT 2020). Within the CAP, only some instruments, in particular coupled DPs, can be categorized as harmful subsidies (Schmid et al. 2007). These are sector-specific coupled payments that are decided upon by the MSs. They incentivize higher production through linking payments with, for example, a number of eligible livestock (Hristov et al. 2020), and they usually lead to a higher local farming intensity than would be the case without coupled DPs. This is because many of the supported production systems are relevant drivers of climate change (e.g., meat or milk production) or input-intensive production, such as protein crops, sugar beet, vegetable production, and horticulture.

Decoupled DPs cannot be regarded as harmful subsidies since they are not linked to production intensity (Schmid et al. 2007). An exception can be perhaps found in Bulgaria, where decoupled DPs are linked to the requirement to reduce landscape elements on supported grassland farms (Trapp and Lakner 2018).

Other CAP instruments, however, may have unintentional impacts. Examples include investment measures (Pillar II) but also sectoral supports such as olives, wine, cotton, and renewable energy as well as support for irrigation and Areas of Natural or other area-specific constraints.

4. Policy Outcomes and Impacts: The Case of Germany

In this section, we analyze the (cost-)effectiveness and impacts of both AECMs and Greening for Direct Payments using the case of Germany as an example for one of the major economies and agricultural sectors among the MSs and because of the availability of comprehensive and detailed data.

4.1. Analysis of AECMs

4.1.1. The Effectiveness of AECMs

There is a broad literature on AECMs focusing on effectiveness towards the maintenance of biodiversity. Despite a large heterogeneity within the objectives, content of the measures, complexity, and payment level, AECMs often have a positive impact on biodiversity.

- AECMs often lead to an increase in species diversity: Examples of good practice have been identified in Germany, Switzerland, and Spain (Kleijn et al. 2006).
- With regards to Natura 2000, studies show that AECMs can contribute to the successful implementation of the Habitat Directive (Lakner et al. 2020).
- AECMs on areas out of production are more effective than in productive regions (Batáry et al. 2015).
- Existing landscape and management types influence the impact of AECMs. Overall, landscape structures can overlay the effects of AECMs. For example, fields with a small size in West Germany have been found to provide a higher biodiversity than larger fields in neighboring East Germany (Batáry et al. 2017). The same can be found for organic farming, which is more effective in intensively used farming systems, whereas, in diverse landscapes, the effect is smaller (Tuck et al. 2014).

Generally, the literature distinguishes between broad entry programs and specific and more advanced programs, often labelled as 'light-green' and 'dark-green' AEPs. A study by the ECA (2011) has pointed out that, especially the specific, dark-green programs are 'effective' and contribute substantially to the conservation of species, whereas the unspecific light-green programs often contribute little to nothing towards

the outlined objectives. This finding is confirmed by many studies (e.g., Armsworth et al. 2012). Some studies indicate that the share of spending on effective programs is rather low (Freese 2012). Oppermann et al. (2012), for example, show that of 7.6% expenditures for AECMs, only 1.2% are effective (dark-green). The share of spending for effective AECMs on arable land is even lower, a mere 0.2%. On grassland, 11% of the grassland area is managed by effective AECMs; for arable land, the share is again lower with 0.3% (Oppermann et al. 2012).

4.1.2. Cost-Effectiveness and Administrative Costs of AECMs

Conceptually, the payment level for AECMs is based on the average opportunity costs to the farmers within a region. This leads to a spatially uneven participation behavior since farmers on more favorable production locations have to face higher opportunity costs finally resulting in non-participation, whereas farmers in less productive locations face lower opportunity costs, such that participation is attractive. The spatially uneven distribution is depicted in Figure 7, in a map of the federal state of Bavaria in 2012.

There are also administrative costs involved. In the federal state of Baden-Wuerttemberg, for example, Pillar II (EAFRD) has administrative costs of 32% of the amount of the payments made, in contrast to Pillar I (EAGF) with administrative costs of only 7% (Landesrechnungshof Baden-Württemberg 2015). This is also true for AECMs, however, with substantial variation between different programs and between German federal states. Fährmann and Grajewski (2013) find between 7% and 18% average administrative overhead for AEPs in different federal states. The percentage is also depending on the intensity of regulation. Light-green AECMs are associated with low administrative costs (12%), whereas targeted, dark-green AECMs or conservation programs face high administrative costs (36%); organic farming has low administrative costs of 9% (Fährmann and Grajewski 2013).

The German Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection argues that, to a certain extent, administrative costs are necessary means to achieve agri-environmental targets (WBAE 2019). Furthermore, Armsworth et al. (2012) show that higher administrative costs through dark-green AECMs are justified by a much greater increase in biodiversity.

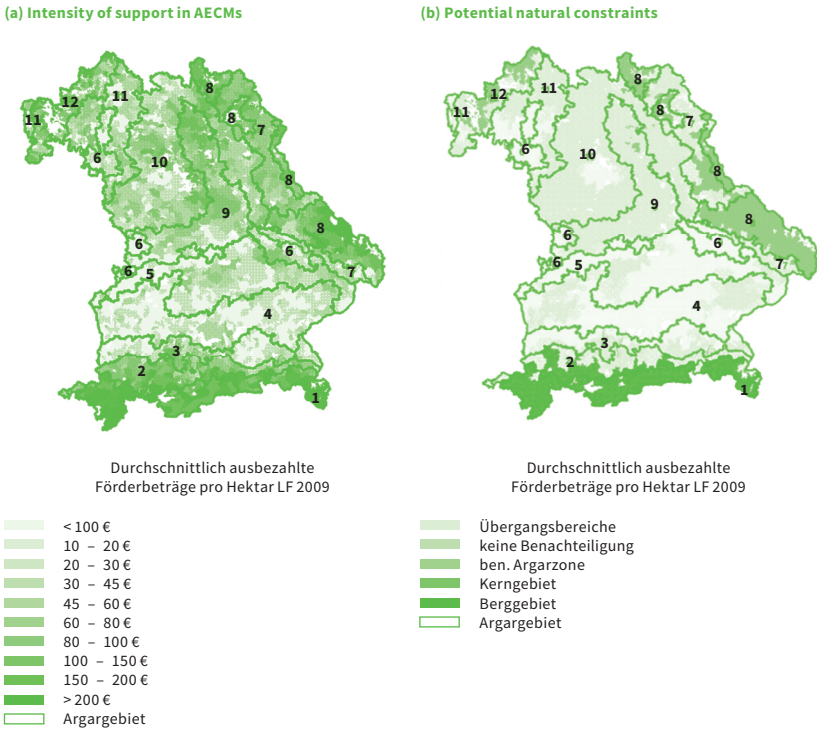

Figure 7. Regional participation in Agri-Environmental Programs (AEPs) and location quality in Bavaria 2012. Source: Wanner (2012).

4.2. Analysis of Greening of Direct Payments

The EC presented a cost estimation for proposed Greening measures within an ex-ante assessment of the CAP reform, assuming even stricter rules of application as formulated in the proposal of 2011 (EC 2011) (Figure 8).

According to this assessment, crop-diversification and maintenance of grassland were presumed to not cause additional costs on 92% and 84.5% of the farms in the EU-27, respectively. Even for EFAs, the assessment predicts no additional costs for 54% of the farms (see Figure 8). Only farms larger than 15 ha have to comply with EFAs, so exemptions reduce the impacts of EFAs. According to an ex-ante study by Pe'er et al. (2014) based on data from Eurostat, 88% of all farms and 48% of the farmed area in the EU were exempted from EFAs. The decision patterns of farmers

can be studied based on EU data; however, this is only for the year 2015. More detailed data are available for Germany 2015–2018 (Figure 9).

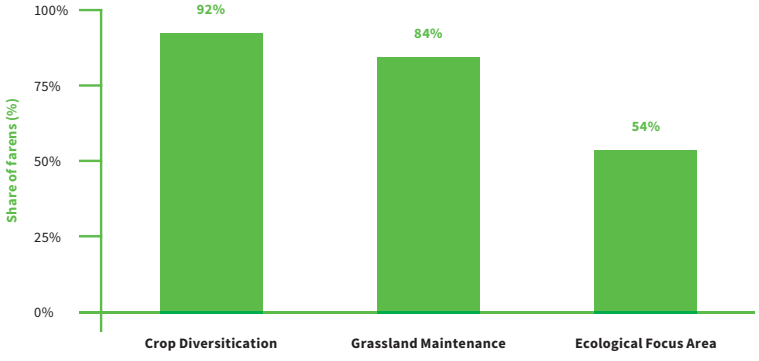

Figure 8. Share of farms with no additional costs due to Greening in the EU-27. Source: own presentation, data from the Ex-ante Impact Assessment (EC 2011, pp. 9, 12 and 17).

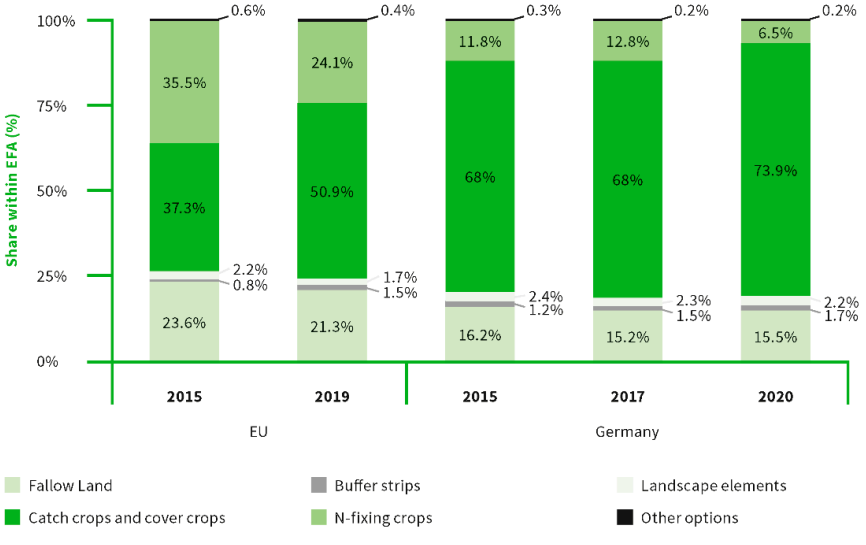

Figure 9. Chosen Ecological Focus Area (EFA) options by farmers in the EU 2015 and Germany 2015–2018. Source: Alliance Environment (2019, p. 33) and BMEL (BMEL 2016–2019). Note: The shares refer to the EFA before Weighting Factors.

The actual decisions of farmers in 2018 in the EU on choosing EFA options show a strong emphasis on production-oriented options such as catch crops (50.9%) and nitrogen-fixing crops (24.1%) (Alliance Environment 2019, p. 33). In Germany in the year 2019, two production-oriented options—with catch crops (73.9%) being the largest and nitrogen-fixing crops (6.5%) the third largest—also took a substantial share of EFAs with 81% of the net area (i.e., the area before applying weighting factors). Among the non-productive options, fallow land takes the largest share, with around 23.6% in the EU and 15.5% in Germany; in turn, buffer strips (1.5%/1.7%) and landscape features (1.7%/2.2%) have only a very low share (Pe'er et al. 2017a).

To analyze the effectiveness of different EFA options, Pe'er et al. (2017b) interviewed 89 ecologists (Figure 10).

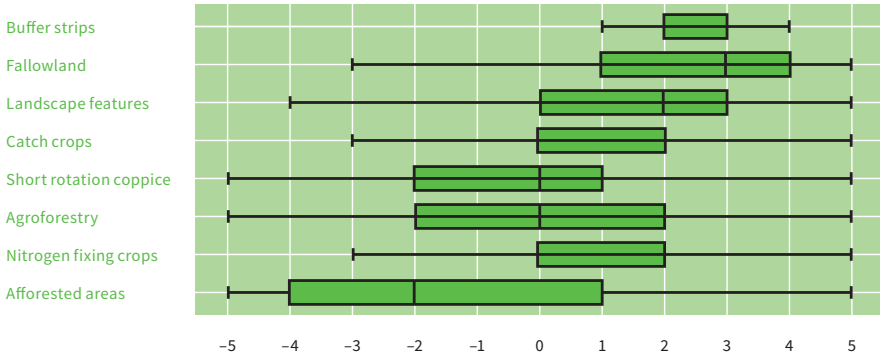

Figure 10. Survey on effects of the different EFA options for biodiversity. Source: Pe'er et al. (2017b); Note: Evaluation from positive (+5) to negative (−5); No. of participants = 89 within EU and Switzerland.

A first group shows a positive median value. The arithmetic mean shows some degree of variation for buffer strips (2.5), fallow land (2.4), and landscape elements (1.7), which are all evaluated as effective. A second group of EFA options show a median value of zero; i.e., they are largely ineffective. Some options show a slight positive arithmetic mean, such as nitrogen-fixing crops (0.7) and catch crops (0.4), which still seem to have a positive effect on biodiversity, whereas agro-forestry (−0.1) and short rotation coppice (−0.4) are neutral to slightly negative. A third group (afforestation areas) has a negative median value and is evaluated as significantly negative, i.e., counterproductive (−1.4). The results of this survey have been largely confirmed by two recent field studies on Greening measures, both concluding that fallow land, buffer strips, and landscape elements are most effective to protect target species of farmland birds or insects (Dellwisch et al. 2019; Ekroos et al. 2019).

The European Court of Auditors concludes that Greening "has led to very limited change in farming practices" (ECA 2017, p. 24).

5. Problem Evaluation

5.1. Farmers' Decisions on Conservation Measures

The management of agricultural landscapes has strong impacts on biodiversity conservation. There is a broad range of factors determining farmers' adoption of conservation measures (Figure 11; (Brown et al. 2019)), including structural, financial, ecological, political, and socio-demographic factors as well as farmers' values and attitudes and policy design features.

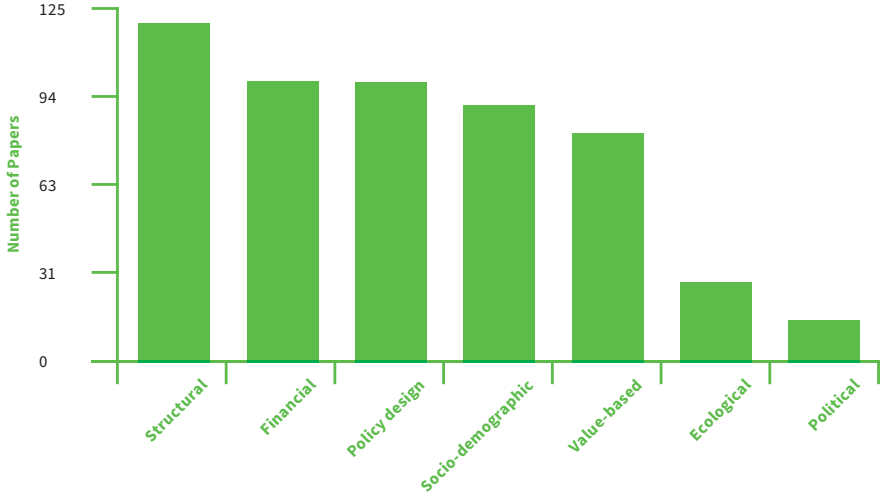

Figure 11. Factors determining farmers' adoption of conservation measures. Source: Brown et al. (2019).

As structural factors, particularly farm size, production system, and farm location have been shown as influential. Findings on the importance of farm size vary across geographies and production systems (Brown et al. 2019). A positive correlation of farm size with AEMs uptake has been observed (Zimmermann and Britz 2016) and explained with a better education of large farmers (Villanueva et al. 2015). In turn, a specialization in livestock and dairy has been reported as negatively influencing farmers' uptake of conservation measures in England (Hodge and Reader 2010), while favoring farmers' uptake in studies from Italy (Borsotto et al. 2008). Literature reports that as farmers specialize in a specific form of farm management, their willingness

to adopt AEMs depends on the extent to which conservation practices fit into their technological setting (Vuillot et al. 2016). Furthermore, the geographical location strongly influences farmers' willingness (Zinngrebe et al. 2017). Specifically, areas with high land values are less likely to show strong uptakes of conservation measures (Bartolini et al. 2012).

As a clear pattern in financial factors, higher payments drive farmers' decisions when choosing those EFA options which are least costly, less labor intensive, and leave the largest part of the Greening-payment as 'windfall gain', as shown for the case of cash crops (Lakner and Holst 2015). The positive impact of an economic benefit on farmers' adoption of AECMs was shown, for example, in Germany (Bock et al. 2013) and Italy (Borsotto et al. 2008). The real economic benefits, however, need to prevail when taking into account other costs related to the fear of sanctions, risks of income forgone, and market risks (Prager and Posthumus 2010). There is variation in the role of financial factors depending on the geographical location and the methodology applied (Brown et al. 2019).

As part of the policy design, administrative considerations and farm controls negatively affect farmers' willingness to participate in conservation measures. Furthermore, contract flexibility and taking participatory decisions with farmers increase farmers' willingness to participate (Geitzenauer et al. 2015). What is more, the availability and trust in extension services positively relates to the adoption of conservation measures (Brown et al. 2019).

Socio-demographic factors: while young farmers are more likely to take up conservation measures, the statistical effect of the age of farmers is highly dependent on the social-ecological context (Brown et al. 2019). Some studies find part-time farmers as more likely to engage in AEMs (Vesterager and Lindegaard 2012), while others report a stronger participation of full-time farmers (Matzdorf and Lorenz 2010). Moreover, a stronger focus on productivity is reported to correlate with less AEM uptake (Kvakkestad et al. 2015). Furthermore, the level of education and training might have a positive impact on the adoption.

Values and attitudes of farmers influence their disposition for conservation activities. Production-oriented farm management has a negative effect on farmers' uptake (Breustedt et al. 2013). At the same time, openness and an interest in environmental considerations increase the willingness to participate (Brown et al. 2019). For example, traditional customs, such as the implementation of landscape elements ('Knicks') since the 18th century in the German federal state Schleswig-Holstein, lead to a strong uptake of this measure. Social networks and trust further increase farmers' willingness to adopt measures.

Ecological factors play a role, particularly if a positive effect for landscape and wildlife is perceived (Brown et al. 2019). Visible ecological benefits, such as near water bodies or ecologically valuable areas seem to favor implementation (Grammatikopoulou et al. 2012). Particularly high shares of grassland and a heterogeneity of farm structures are reported to increase farmers' uptake (Matzdorf and Lorenz 2010).

As a last but relevant political factor, distrust in government or in environmental schemes negatively impacts the willingness of farmers to participate in conservation schemes (van Zanten et al. 2014). A misconception of farmers' motivations in political arenas is a potential leverage point for improving the CAP's design and induce more effective implementation (Brown et al. 2021).

5.2. Facilitators and Barriers for a Transition towards Environmentally Friendly Farming

There is clearly a need to improve and increase the uptake of AECMs. The CAP reforms to date have been quite unsuccessful. The established AECMs (together with CC) do not achieve sufficient impacts to halt the decline in biodiversity or to substantially contribute to climate change mitigation within the farming sector. In his seminal paper, Günther Schmitt (Schmitt 1984) has posed the question, 'why is the agricultural policy as it is and not as it should be?'. This question is still highly relevant for the CAP, especially in view of the agri-environmental targets. In this section, we suggest why there is such little progress within respect to the stated agri-environmental targets.

5.2.1. Unclear and Conflicting Objectives

One main obstacle is the vague and contradicting objectives within the CAP. Throughout several reforms of the CAP, the EU added new objectives without adjusting or aligning them. The Treaty of Rome in 1957 defines the original CAP objectives, which were implemented throughout the 1960s by applying market regulations, such as intervention price system and external tariff protection to several sub-markets.

In the Treaty of Lisbon (2009), the EU has confirmed the classic CAP-objectives in Article 39, despite some of them being rather outdated. However, the post-2020 CAP proposal lists nine 'new objectives', of which three are environmental objectives, referring to the protection of biodiversity, climate action, and resource efficiency (EC 2018). While the objectives income (a), competitiveness (b), and market stabilization (c) can still be linked to the 1957 objectives, the environmental (d, e and f) and rural development objectives (g, h and i) cannot. These diverging

objective systems are introducing new conflicts between objectives, for example, between competitiveness and environment or between income and environment (Pe'er et al. 2019, SM).

5.2.2. Flexibility Instead of Subsidiarity

The CAP is offering finances and measures for a highly diverse continent, including very different climate zones, heterogeneous production locations, diverse farm structures, and differently developed national economies and farming sectors.

Based on the economic theory of fiscal decentralization (Oates 1997), the EU pursues the subsidiarity principle meaning that policy making takes place at the lowest possible level that can produce effective outcomes. Central solutions seem reasonable if there are (a) economies of scale in the provision of public goods and (b) homogeneous environmental, social, and market conditions across MSs. In turn, decentral solutions enable national and sub-national governments to adjust policies to diverging social preferences and social-ecological contexts. Thus, the appropriate level of subsidiarity has to balance uniform regulation with flexibility to maximize synergies and to account for trade-offs.

In the CAP reform of 2015, the 'trilogue process' (i.e., the negotiation of EU Commission, Council, and the EU Parliament) and the introduced flexible elements have led to a process of watering down of the main reform elements. Here, MSs have often used the top-down flexibilities to implement the softest possible option for their national farming sectors. Since 2005, the EC has continuously increased the use of flexible elements in the CAP (Box 1).

Box 1. Genesis of 'flexible elements' with the CAP.

2005	Different decoupling models of direct payments, differently used within the EU (Fischler Reform 2005)
2009	Regionalization of direct payments, the option to maintain coupled payments within some specific agricultural sectors (Anania and Pupo D'Andrea 2015), (Health Check 2009)
2013	Some flexible elements (Greening, coupled payments, flexible transfer between pillars and options for redistributive payments) (Ciolos Reform 2013)
2020	Full flexibility and national implementation, containing 'strategy plans' with an agreement between EU and MSs on target-oriented implementation (CAP Reform 2021)

However, these flexibilities come with no clear guidelines in programming and no clear outcome indicators for measuring their impact. With respect to Greening, for example, flexibilities have increased the EFA elements, such that farmers had

a large choice between elements; however, many options are hardly effective or even counterproductive. Thus, the flexibilities introduced with the Ciolos Reform have undermined and watered-down environmental measures and diluted their effectiveness, still, however, with substantial differences among regions and MSs.

5.2.3. CAP Politics and the Influence of Lobbyism

In the 1960s, Mancur J.R. Olsen introduced the theory of collective action, showing the incentives towards political influence and lobbyism. To attract members, associations have to lobby for political rents for their members (Olsen 1965). The theory further developed by Gary Becker, however, had a more positive view: different stakeholders compete on the political market and create better information for political deciders (Becker 1983).

The CAP can be regarded as a classic example for lobby influences on a specific sectoral policy. From its beginning in the mid-1960s to the 1980s, especially the decisions on intervention prices were taken unanimously in non-public sessions by the council of agricultural ministers in Brussels, at that time far away from any public or media attention and without any minutes (Runge and von Witzke 1987). Here, price-decisions were made like at a 'restaurant table' using a 'menu' meeting the preferences/needs of concrete ministers and national agricultural sectors, whereas costs were ultimately borne jointly by the six MSs (Schmitt 1984).

The role of institutions and the design of decision-making processes can play a decisive role and exhibit a strong impact on today's CAP. As a consequence of the Treaty of Lisbon in 2009, the co-decision-making process was extended and the European Parliament (EP) increased its influence during the 2013 CAP reform process (Fertö and Kovacs 2015). But despite the extended influence of the EP, the farmer-supportive, conservative groups continue to dominate the Committee on Agriculture and Rural Development (COMAGRI) of the EP, resulting in a constrained disposition for reform, while, similarly, DG AGRI dominated the final CAP design despite a consultation with other Commissioners (Knops and Garrone 2015). These findings on the 2013 reform align with the 'old' hypothesis that small interest groups with homogeneous interests (here, farmers associations) dominate political processes compared to larger groups with heterogeneous interests (here, the general public, other sectors).

While new discourses of multi-functionality and sustainability entered the political arena, a 'productivist' narrative continues to dominate political discourse and the resulting policy design (Erjavec and Erjavec 2015). Despite multiple changes in the EU decision rules, with a shift in favor of the European Parliament, the new

flexibility introduced by the CAP reform 2013 implies a return to the 'restaurant table game', where MSs can freely choose, for example, between different Greening options, redistribution models, or coupled payments, which can be granted to diverse farming sectors. In most cases, this flexibility is not leading to the provision of more public goods, but rather to more market distorting coupled payments or a watered-down Greening (Alons 2017). Implementation of the Ecological Focus Areas within the Greening obligations showed a strong underrepresentation of ecologically effective measures (Pe'er et al. 2017a; Zinngrebe et al. 2017; Brown et al. 2019).

5.2.4. The Role of Administration for Policy Design

National and regional agricultural administrations play a key role in designing, programming, and controlling the implementation of AECMs. Whether or not an MS or region is offering ambitious or targeted AECMs depends on the available administrative and financial resources. AEPs necessitate between 10% and 35% administrative top-up costs. High administrative costs are a barrier for state administrations to implement complex and, in particular, targeted AECMs (WBAE 2019). This is particularly relevant in eastern MSs, where agricultural administrations are smaller and budget shares for AECMs are lower. In north-western EU MSs[3], about 33.5% of the RDP spending for 2014–2020 is dedicated to AECMs, Organic Farming, and Natura 2000, whereas, in eastern and southern MSs, it is just 19.8%/18.4% (own calculations, based on (EC 2016)). From a farmer's perspective, high administrative burdens are a disincentive to use AECMs, too.

6. Conclusions

We showed that CAP reforms have repeatedly failed to draw on the accumulated knowledge on policy processes and implementation. Consequently, institutional learning along the initially described policy cycle for transformation is disrupted at several levels. Based on the reviewed literature, we conclude that the highly politicized and biased process of incorporating inputs from the public and from evaluation results of previous CAP reforms lacks sufficient structure, transparency, and inclusivity.

The key challenge that remains is how to transform a post-2020 CAP into an incentive framework supporting multifunctionality and the provision of societal

[3] Northwestern MSs: BE, DE, DK, IE, LU, NL, UK, AT, FI, SE; Southern MSs: FR, EL, IT, MT, PT, ES, CY; Eastern MSs: BG, CZ, EE, HR, LV, LT, HU, PL, RO, SK, SL.

services related to the sustainability of agricultural landscapes. In the remainder of this section, we briefly introduce the most recent CAP reform proposal and reflect on its opportunities, potentials, and shortcomings:

6.1. The Post-2020 CAP Reform

The post-2020 CAP reform has four main elements linked to environmental aspects:

1. A set of nine new CAP-objectives is proposed, including three objectives: (c) Climate Action, (d) Environmental Care, and (e) Maintenance of Biodiversity. Given the CAP-budget 2017, so far, less than 20% of the spending relates to environmental objectives, whereas the largest share (60%) is linked to the income objective (Pe'er et al. 2019). Adding to this, some of the objectives are vague and conflicting with each other. Furthermore, the EC has no plan how potential conflicts shall be moderated.
2. A new implementation model for the CAP introduces more flexibility to the MSs, determining their implementation model in the form of a strategic plan. Here, an MS has to describe objectives and deficits using a set of indicators (output, result and impact indicators). It is to be used as a management instrument including documenting results and, if insufficient, adjusting the plan. However, it is unclear on what grounds the EC might reject a strategic plan or require MSs to change its implementation.
3. The new green architecture of the CAP compiles several environmental instruments and measures that already exist, such as AECMs. Furthermore, under the term 'Conditionality', CC now combines elements of Greening within the GAEC, defining requirements for receiving DPs. For example, crop diversification corresponds to GAEC 8 and maintenance of grassland to GAEC 1, 2 and 10; EFAs relate to GAEC 7 (catch crops), GAEC 4 (buffer strips), and GAEC 9 (landscape elements and fallow land). The new GAEC criteria also relate to the Natura 2000 network (SMR 3 and 4, Table 3).

Since MSs choose the set of criteria when implementing the new CAP, the actual impacts of 'Conditionality' are unclear.

The EC proposes 'Eco-Schemes' related to climate and the environment (Article 28), which are yearly AECMs within Pillar I. MSs have to offer these schemes; however, they are voluntary for farmers. The eco-schemes can be cost covering, yet premiums may also contain an income component, thus going beyond opportunity costs. MSs can decide on the funds they want to dedicate to this instrument; yet, a minimum share within Pillar I is discussed.

Table 3. Selected criteria of the good agricultural and environmental conditions.

Criterion	Requirements and Standards	Main Objective of the Standard
Climate action		
GAEC 1	Maintenance of permanent grassland based on a ratio of permanent grassland in relation to agricultural area	General safeguard against conversion to other agricultural uses to preserve carbon stock
GAEC 2	Appropriate protection of wetland and peatland	Protection of carbon-rich soils
Water		
GAEC 4	Establishment of buffer strips along water	Protection of river courses against pollution and run-off
Soil (protection and quality)		
GAEC 7	No bare soil in most sensitive period(s)	Protection of soils in winter
GAEC 8	Crop rotation	Preserve the soil potential
Biodiversity and landscape (protection and quality)		
SMR 3	Birds Directive: Article 3(1), Article 3(2)(b), Article 4(1), (2) and (4)	
SMR 4	Habitats Directive: Article 6(1) and (2)	
GAEC 9	• Minimum share of agricultural area devoted to non-productive features or areas • Retention of landscape features • Ban on cutting hedges and trees during the bird breeding and rearing season • As an option, measures for avoiding invasive plant species	Maintenance of non-productive features and area to improve on-farm biodiversity
GAEC 10	Ban on converting or ploughing permanent grassland in Natura 2000 sites	Protection of habitats and species

Source: European Commission (EC 2018).

4. A Multiannual Financial Framework (MFF) of the EU 2021–2027 was proposed by the EC in May 2018. Since the United Kingdom, one of the net payers to the EU budget, left the EU in January 2020, the proposed MFF contains a cut for the agricultural budget. This MFF proposal was published before the draft of the post-2020 CAP reform, suggesting an asymmetric budget cut of 11% for Pillar I and 28% for Pillar II (Matthews 2018), thus, to some extent, predetermining the CAP reform.

6.2. Potentials and Challenges of the Post-2020 CAP

The new post-2020 CAP gives more responsibility to MSs by using a larger set of flexible elements. This has a number of advantages and drawbacks from an environmental perspective:

- The new green architecture has widened the set of measures and instruments by introducing a wider set of conditionality and rather simple, yearly eco-schemes in Pillar I (Pe'er et al. 2019). This, combined with the established AECMs in Pillar II, provides many options, where MSs can create suites of measures fitting to the national context.
- The top-down approach of Greening, which defined uniform measures for all MSs, had rather limited effects since MSs watered down the EC's proposal (Alons 2017) and the national implementation was often lacking ambition. A more flexible, subsidiarity-oriented approach may better address the MSs needs.
- However, experiences with flexible elements in the past show that lacking environmental ambition and reluctance to change are main barriers for an ambitious implementation. Here, the post-2020 CAP reform proposal does not have clear guidelines and minimum requirements for its flexible elements. The EC has called on the MSs to show 'increased ambition with regard to environmental- and climate-related objectives' (EC 2018, Article 92); yet, it is not clear if this would have any consequences for approving the MSs' strategic plans. Here, the set of indicators for evaluating the strategic plans has been criticized for leaving a broad space for interpretation (Pe'er et al. 2019).
- *The* 'higher ambition' is implemented, for example, using a 'performance bonus' (EC 2018, Article 123). Effectively, MSs might be tempted—unambitiously—to choose simple measures with low requirements and high probable participation rates. Thus, the indicators need to be more precise to avoid MSs using the flexibility to implement only most 'convenient measures' with rather low environmental effectiveness.
- Finally, maintaining many instruments such as DPs and coupled payments signals a business-as-usual CAP reform. DPs as an instrument of income policy are ineffective, distort markets, and lack a clear scientific justification. Coupled payments distort markets and production, and support only some production systems like milk or meat production, which have a strong negative impact on the climate via GHG emissions. Furthermore, the different types of DPs still account

for ca. 38% of the CAP budget; funds are needed to finance agri-environmental policies within the CAP.

Thus, it is unclear whether EC and MSs were able to apply conclusive learning within the CAP-context. The post-2020 CAP reform has some interesting potentials; however, since there are no clear minimum requirements, implementation by the MSs might be unambitious. Here, much will depend on the final decisions of the Council and EU Parliament in 2020, the implementation in the MSs, and the reactions of farmers on the ground.

6.3. Potential Instruments and Approaches for a Transformation

There is a further range of instruments and approaches that could facilitate a transformation towards biodiversity-friendly EU agriculture as elements of future CAP reforms and beyond:

1. Phasing out DPs would acknowledge their poor performance for both income and sustainability aims. Focusing instead on using public money (mainly) for providing public goods, all payments should be made conditional on higher environmental standards. In a transition phase, the flexibility to transfer budgets into Pillar II could be enhanced and at least 30% of DPs ring fenced for effective measures under eco-schemes. A similar approach has been taken for the new post-Brexit agricultural policy in the United Kingdom (DEFRA 2018).
2. Supporting landscape-targeted and coordinated actions among farmers would allow larger-scale goals for biodiversity conservation to be achieved and could be implemented in both pillars. Such a landscape-level perspective would allow for the local targeting of management measures that can achieve a more effective delivery of public goods, such as maintaining water quality (Jones et al. 2017) and reducing fire hazard (Moreira and Pe'er 2018). Successful examples of landscape governance and collaborative implementation of environmental measures, going beyond the farm-based implementation of AECMs, include local initiatives or 'coalitions' in the Netherlands. In order to improve income security and ecological benefits, such approaches should entail longer-term contracts with farmers and groups of farmers. The current CAP allows MSs to support collaborative implementation of greening measures as well, but only two MSs have taken up this option (the Netherlands and Poland). Furthermore, using the management plans for the Habitat Directive might be another opportunity to implement such approaches (Lakner et al. 2020).
3. Supporting innovative and enhancing existing agri-environmental instruments could involve the more widespread implementation of result-based

agri-environmental schemes (Schroeder et al. 2013) and/or the introduction of a points system to increase farmers' benefits proportionate to ambition and/or investments in the provision of a broader range of ecosystem services (Neumann et al. 2017). So far, however, result-oriented schemes have only been implemented in some MSs in an experimental way, yet with both positive ecosystem effects and positive perceptions from farmers' (Schroeder et al. 2013).

In general, the last two approaches (2 and 3) have been considered in the post-2020 CAP proposal: Articles 65 (AECMs) and 71 (Cooperation) allow for the support of collective schemes and result-based schemes, relating to the potential implementation of measures at a larger-scale level, i.e., by groups of farmers. However, Article 71 does not necessarily relate to environmental objectives and may even promote unsustainable farming practices (i.e., homogenization), and Article 65(7) is only voluntary for MSs to adopt. Furthermore, there are no instruments in Pillar I relating to larger-scale implementation, neither as CC mechanisms nor in eco-schemes (Article 28).

In order to address the above challenges and to make the CAP a coherent framework for the sustainable development of rural areas and for achieving the SDGs, in particular SDG 15 Life on Land, the respective political decision-making processes and institutional settings need to be adjusted (Pe'er et al. 2019). Without including other political and other stakeholders in negotiations on budget allocations and policy design, agricultural interest groups will continue to preserve current trajectories and undermine any initiative for sustainable transformation.

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