Overview of regulatory and incentive instruments for biodiversity management on farms

Deliverable D8 (D2.1)

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SHOWCASE

SHOWCASing synergies between agriculture, biodiversity and Ecosystem services to help farmers capitalising on native biodiversity

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SUMMARY

This document represents Deliverable 2.1 *"Overview of regulatory and incentive instruments for biodiversity management on farms"* within WP2 *„Identifying incentives to promote biodiversity and ecosystem services in agricultural landscapes"* of the EU Horizon 2020 project SHOWCASE. It reports the outcomes of WP2 Task 2.1 *"Evaluating regulatory and incentive instruments for biodiversity management on farms"*.

In the 1st and 2nd chapter, the report gives a short introduction of the deliverable's objectives, the tasks addressed, the report's outline and the main focus of the literature review.

Chapter 3 gives an overview of the main laws governing biodiversity protection in the European Union. The main elements of the Birds and Habitats directives are presented, alongside other biodiversity laws and policies, with a focus on the obligations and requirements they set on agriculture in order to protect European native wildlife. Chapter 3 also covers the features of the EU's Common Agricultural Policy that operate as a regulatory baseline for all beneficiaries of farm subsidies, i.e., cross-compliance and greening requirements under the current CAP and the new conditionality in the CAP 2023-2027.

Chapter 4 gives an overview of economic and non-economic approaches potentially promoting farmers' pro-biodiversity behaviour. Whereas economically oriented approaches imply positive or negative monetary flows – compensation payments or rewards vs. penalties – to motivate farmers to implement biodiversity-friendly management practices or to prevent them from harming biodiversity, partnerships and networks steer farmers' behaviour through agreeing on a common goal and working towards it by sharing resources, skills and risk. With regards to the agricultural focus of SHOWCASE, Chapter 4 looks in more detail at the incentives provided by the Common Agricultural Policy (CAP) of the European Union. This covers both the current and future CAP, with an overview of how the novel eco-schemes can provide new incentives for farmers to adopt biodiversity friendly practices.

Chapter 5 looks into how the combination of regulatory frameworks and incentives operate in practice for farmers in the EU. To this end, grey literature and European Commission publications related to farming for biodiversity have been reviewed. A specific focus is set on biodiversity-friendly farming in Natura 2000 sites, as central exemplary areas of continuous and long-lasting efforts in biodiversity conservation. This is followed by revising some of the main conclusions from very recent grey literature assessing the successes and failures of the CAP in relation to biodiversity.

Chapter 6 provides an overview of approaches that have already been implemented to incentivize farmers' pro-biodiversity behaviour. Based on grey literature, various types of approaches – i. e. focusing on plot or farm level, land tenure or the entire value chain, building on organic farming or including market-based, value-based or measure-based mechanisms – were identified within the EBA countries, further EU member states and selected western countries outside the EU. In sum, 62 examples of pro-biodiversity schemes were included in the further analysis representing highly divergent incentivizing mechanisms and the most important agricultural systems of the EBAs as well as in consequence serving as an information platform for further EBA scheme design activities.

Based on the preceding chapters and their focus on result-based approaches, Chapter 7 casts a critical eye on their suitability with regards to various regulatory, policy, social and administrative contexts also considering potential national differences. On the international level, WTO requirements such as Green Box rules are a limiting factor with regards to result-based payment modalities and thus scheme design. On the national and regional level, issues to be considered include long-term availability of funding, guaranteeing additionality if requested, stakeholders' and decision-makers' attitudes towards agri-environment-climate measures in general as well as towards result-oriented approaches specifically, availability of suitable indicators and IT-systems, access to extension services and profound know-how of

farmers and public authorities regarding the interlinkages between biodiversity and farming practices. On individual level, farmers' trust in involved institutions and their willingness to participate are additionally discussed as highly relevant factors affecting the suitability of result-based approaches.

In Chapter 8 a structured overview on factors influencing farmers' willingness to promote biodiversity by implementing voluntary biodiversity measures is presented. Based on the review of scientific literature, the chapter describes several determinants which have been identified along three scales, i.e. 1) society, community and landscape, 2) farm scale, and 3) farmers' intrinsic factors. The main influencing factors at the first scale range from the design of policies, to economic aspects, to socio-cultural norms. The second scale encompasses relevant farm characteristics, such as farm type and size to field conditions. For the farmers' intrinsic factors age, education, experience, and self-identity play an important role. However, it is important to make a distinction between farmers' willingness to participate in schemes and their actual behaviour, because the latter is determined by their ability to do so.

Chapter 9 closes the Deliverable by giving an outlook on the further use of the results for scientific analyses within SHOWCASE, supporting mainly the work of designing interventions in WP1 and of developing surveys and model designs in WP2, as well as providing a basis for communication and policy recommendation material for WP4.

1 Introduction

1.1 Objective

The overall objective of the SHOWCASE project is to make biodiversity an integral part of European farming by identifying effective incentives to invest in biodiversity in diverse socio-ecological contexts, providing the evidence that these incentives result in biodiversity increases and biodiversity-based, socio-economic benefits, and communicating both the principles and best practices to as wide a range of stakeholders as possible.

Within the SHOWCASE project structure, Work Package 2 (WP2) is specifically devoted to incentives that successfully steer agricultural farm management in a direction which enhances biodiversity and the associated ecosystem services on farmed land and in the surrounding landscape. The WP2 explores farm incentives in a wide sense, aiming to provide a critical evaluation of different pathways to biodiversity targeted management. It thus analyses regulatory frameworks and private and public incentive instruments and their combinations from different perspectives, including farmers' willingness to adapt their management, the efficiency and costs of implementation, as well as the timing and monitoring of outcomes.

The overall objective of the Deliverable D2.1 at hand, is to report the outcomes of WP2 Task 2.1 *"Evaluating regulatory and incentive instruments for biodiversity management on farms" (M1-M12*). As indicated by the title, Deliverables 2.1 aims at giving an "*Overview of regulatory and incentive instruments for biodiversity management on farms*". Deliverable D2.1 was preceded by Milestone 8, representing a first draft of the review report, which was circulated to all partners and particularly WP2 task leaders in order to already feed into tasks T2.2, T2.3, T2.4, T2.5 by delivering the state of the art, by setting a common ground for analyses and by supporting the elaboration of questions for the expert interviews and surveys.

1.2 Task addressed

Task 2.1 "Evaluating regulatory and incentive instruments for biodiversity management on farms (M1-M12)"

Leader: BOKU; Co-Leader: ZALF, WWF EPO

Task T2.1 aimed at framing and characterising existing regulatory and incentive instruments and identifying key determinants for the acceptance and feasibility of an implementation. Therefore, in the task a broad literature review on current regulatory frameworks and existing private and public incentive schemes, targeting biodiversity enhancement in agriculture has been carried out. In the review, different foci have been set. First, the task aimed to give an overview on what general regulation and incentives exists in the European Union, and what specific regulatory frameworks and existing private and public incentive schemes are implemented and combined. Also, the task had the objective to better characterise key determinants for acceptance and uptake of incentives by farmers. The task in all aspects had a special emphasis on result-based schemes, as promising instruments to better target effectiveness of biodiversity provision. Here, particularly the design, as well as the determinants and the fostering and hindering factors for the implementation of such schemes were in the focus. The data basis of the task was explicitly not only stemming from common academic literature databases, but also involved the screening of grey literature, detailing first and foremost on existing regulatory frameworks and biodiversity initiatives within and beyond the European Union.

1.3 Outline

Deliverable D2.1 is structured as follows:

Chapter 2 first outlines the focus of the literature review. Chapter 3 and Chapter 4 give an overview on the common regulation and incentive mechanisms for enhanced biodiversity

provision in European agriculture. Chapter 5 is devoted to the question of combinations of regulation and incentives, putting a specific focus on biodiversity-friendly farming in Natura 2000 sites, as central exemplary areas of continuous and long lasting efforts in biodiversity conservation. Chapter 6 comprises a comprehensive overview on existing private and public incentives for improved biodiversity provision from agriculture implemented in European and Non-European countries. Chapter 7 is then devoted to the preconditions of an implementation of particularly result-based incentive approaches. Chapter 8 gives insights on the part of the literature review focussed on farmers' perceptions of biodiversity and willingness to apply biodiversity-friendly farming measures. Finally, Chapter 9 gives an outlook on further use of Deliverable 2.1 for scientific analyses in the project.

2 Main focus of literature review

According to the description of action, but also in consideration of those SHOWCASE work packages and tasks benefitting the most from this review, the T2.1 literature review is focused on the following main areas of interest:

(1) Overview on current regulatory frameworks targeting biodiversity enhancement in agriculture
(2) Overview on current private and public incentive schemes biodiversity enhancement in agriculture
(3) Combination of regulatory frameworks and incentives
(4) Existing private and public incentive schemes, emphasizing result-based approaches
(5) Context-related pre-conditions for the implementation of result-based biodiversity initiatives
(6) Key determinants for acceptance and uptake of incentives by farmers

3 Overview on current European regulatory frameworks targeting biodiversity enhancement in agriculture

The European Union (EU) plays a major role in defining a common legal framework for its Member States on a large number of environmental areas, including on biodiversity. Indeed, it is estimated that up to 80% of national environmental legislation is directly related to the Union law. The EU also plays a key role in the negotiation of global biodiversity agreements, and then translates them into EU policies and legislation as appropriate.

Additionally, almost one third of the EU budget[1] is currently devoted to the Common Agricultural Policy (CAP), establishing an EU-wide system of farm subsidies that, as part of its objectives, aims to support and strengthen environmental protection. Actually, one of the nine specific objectives of the CAP post-2022 is to contribute to halting and reversing biodiversity loss, enhance ecosystem services and preserve habitats and landscapes.

The Birds[2] and Habitats[3] Directives, also known as the Nature directives, constitute the backbone of EU biodiversity legislation. The Birds directive is the oldest piece of EU environmental legislation. Adopted in 1979, with its last substantial amendment in 2009, its focus is on wild bird species, establishing obligations for Member States, such as:

- The preservation, maintenance and re-establishment of biotopes and habitats for all naturally occurring wild bird species in the EU (Art. 3).
- Special protection measures for a subset of these bird species (Art. 4), with a specific mention to avoiding pollution or deterioration of habitats.

The Habitats Directive, adopted in 1992, established the EU-wide Natura 2000 network of protected areas, and protects over 1000 non-bird animals and plant species, as well as over 200 types of habitats.

The obligations for Member States deriving from the Habitats directive are multiple, including:

- Implementing the necessary conservation measures in Natura 2000 sites (Art. 6.1)
- Preventing any damaging activities within the site that could disturb habitats and species of Community interest[4] in the site (Art. 6.2).
- Protecting the sites from any new potentially damaging plans and projects (Art. 6.3) or, if not possible due to overriding public interest, adopting all the necessary compensatory measures (Art. 6.4)

Member States have transposed the Nature directives to their national legal framework and enjoy significant leeway in how these obligations are implemented on the ground. Beyond the

[1] This percentage is calculated based on the EU's long-term budget, technically known as the Multiannual Financial Framework, and excludes the temporary Next Generation EU funds designed to boost the economic recovery after the Covid-19 pandemic.

[2] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (link), which was preceded by the Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds.

[3] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (link).

[4] Out of ca. 100,000 species present in Europe, the Birds and Habitats directive focus conservation efforts on a subset of around 2,000 of them, referred to as species of Community interest or EU importance.

standard governance and sanctioning mechanisms foreseen in the directives and national laws for cases of infringement of these obligations, the Common Agricultural Policy also includes a system of inspections at farm level that is partly based on these directives.

Indeed, as part of the 2003 reform of the CAP, the EU established that all farmers receiving subsidies from the EU Common Agricultural Policy (CAP) had to respect a basic set of standards known as "cross-compliance". The principle is that farmers violating EU law or other EU standards on environmental, public and animal health, animal welfare or land management would have their CAP support reduced.

This set of do-no-harm requirements attached to EU farm subsidies has evolved over the years but it continues to be of application today, with as much as 84% of the EU's farmland estimated to be subject to CAP cross-compliance (WWF-European Policy Office 2020a). As the potential loss of farm subsidies is highly undesirable, it operates *de facto* as a regulatory requirement for many farmers in the EU.

The Nature directives are part of the system of cross-compliance in the current CAP period (2014-2022), under two Statutory and Management Requirements (SMRs):

- 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)*.

As already agreed by the EU institutions, these requirements will continue unaltered in the future CAP (2023-2027), when cross compliance will start to be called "conditionality". Given the articles of the directives that these SMRs specifically mention, the standards could cover both the necessary conservation measures and the prevention of any damaging activities.

However, it must be noted that i) the Directives have been transposed to national legislation, following different models, and are at different stages of implementation, ii) the obligations set out are in principle on Member States rather than on land managers, and iii) Member States have leeway to devise the CAP conditionality control system based on the general EU regulations.

Therefore, the implications of these standards for land managers receiving CAP support can differ significantly across Member States. In most cases, they are mainly applied to prevent damage, as active conservation measures can be costly to implement and are usually planned with some compensatory payments attached.

Beyond the SMRs, there is one additional standard of cross compliance which is quite relevant for farmland biodiversity. The Good Agricultural and Environmental Condition 7 (GAEC 7), establishes for all farmers receiving CAP subsidies an obligation of:

> *Retention of landscape features, including where appropriate, hedges, ponds, ditches, trees in line, in group or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and, as an option, measures for avoiding invasive plant species*.

While the description of GAEC 7 is quite detailed, Member States still have flexibility as regards the specific landscape features that are protected. One common challenge across many countries has been the mapping of these landscape features, as only those that were located and identified could be the object of protection. As many Land Parcel Identification Systems of the Member States lack this degree of detail, the applicability of GAEC 7 on the ground has been limited.

For the CAP 2023-2027, GAEC 7 has been expanded into a new GAEC 8 that includes additional obligations. Most notably, from 2023 onwards 3% of the arable land in a farm will have to be devoted to non-productive areas and features, including land lying fallow. The

details of how this will be implemented (including, what will count as non-productive areas and features), remains still open, and largely to the discretion of Member States, who will have to include these details in their national CAP strategic plans, which are currently being designed.

Another biodiversity standard under the future CAP conditionality is GAEC 9, which establishes a ban on converting or ploughing permanent grassland designated as environmentally-sensitive permanent grasslands in Natura 2000 areas. This requirement already exists under the current CAP, not in cross-compliance but as part of the requirements to obtain the CAP greening payment (for further details, please see Section 5.1 below).

In the future CAP, there are other GAECs that while they have a different main purpose, they hold potential to contribute to increasing biodiversity on farmland. The main ones are:

- GAEC 2: protection of wetland and peatland (protection of carbon-rich soils for climate mitigation purposes). The specific requirements that this new GAEC will entail are still unknown, as they will largely depend on Member State choices, who also have the option to delay its entering into force until 2025.
- GAEC 4: establishment of buffer strips along water courses (protection of river courses against pollution and run-off). This GAEC already exists in the current CAP, but it now establishes a general minimum width of 3 m and a ban on using pesticides and fertilizers on them.

The greening payments of the CAP 2014-2022 operate quite similarly to cross-compliance, but they hardly include any action that can deliver on biodiversity. According to previous research (Hart 2015), positive effects are only to be expected where the greening obligation of having Ecological Focus Areas on 5% of the arable land of the farm has been implemented through leaving that land fallow. Other options made available in many Member States to comply with that greening obligation (mainly cultivating nitrogen fixing crops and catch/cover crops) have been much more widely taken up by farmers, with very limited biodiversity benefits recorded.

Beyond the Birds and Habitats Directives, there are other biodiversity related EU laws, but with a relatively minor role on preserving farmland biodiversity. One recent piece of legislation that is worth noting is EU Regulation 1143/2014 on Invasive Alien Species, which aims to prevent and minimise the adverse impact on native biodiversity posed by these species. While the import of these species is generally forbidden in the EU wildlife trading regulations, this new regulation establishes a clear joint framework for the eradication and – where this is not possible – management of the populations of invasive alien species, to minimize the harm they cause.

Finally, it is important to mention the EU Biodiversity Strategy to 2030, which announces policy initiatives in this area for the coming years. Published together with the Farm to Fork Strategy by the European Commission in May 2020, these strategies have attracted much attention due to their 2030 aspirational targets aiming to boost organic farming to 25% of EU agricultural land, drastically reduce the use of agrochemicals, and devote at least 10% of agricultural land to high-diversity landscape features[5]. Additionally, the Biodiversity Strategy to 2030 commits to other relevant actions for agriculture, such as reversing the decline of pollinators, and to plant three billion new trees in the EU, in full respect of ecological principles.

These orientations set the EU political agenda, but do not constitute a new regulatory framework, as there are no mechanisms for these objectives and targets to become new rules or obligations that have to be applied or respected at the farm level. For this to happen, they would need to become part of EU laws, and this is not the case. Most notably, the future CAP regulations (adopted in 2021) have not established any strong links with the strategies, so it

[5] This concept of high-diversity landscape features includes, inter alia, buffer strips, rotational or non-rotational fallow land, hedges, non-productive trees, terrace walls, and ponds.

will be politically challenging, but legally possible, for Member States to implement farm subsidies through the CAP Strategic Plans 2023-2027 without orienting them towards achieving any of these targets.

Other than the CAP, the upcoming revision of the Sustainable Use of Pesticides Directive, which will be debated between EU institutions in 2022-2023, is the other main window of opportunity to translate the pesticide reduction goal of the strategies into an EU law. This revision of the Directive could establish a legal mechanism forcing Member States to take more action and achieve significant pesticide reductions.

4 Overview on current private and public incentive schemes targeting biodiversity enhancement in agriculture

Instruments complementing biodiversity-related regulations or command-and-control approaches (EPA s. a.) mainly rely on market-based policies and economic stimuli to steer farmers' and societies' behaviour (EPA s. a.; Pascual and Perrings 2007). These approaches are needed to encourage farmers to provide public goods, in this context to reallocate their production factors from – marketable – commodities to biodiversity (ENRD 2010). Although not necessarily primarily focusing on (financial) incentives or disincentives, **partnerships or networks** may provide further benefits to farmers potentially motivating them to implement biodiversity conservation measures. Such approaches are considered both as the desirable means and the end of environmental governance embodying inclusive and joint environmental problem-solving (McAllister and Taylor 2015) and are therefore included in this overview.

4.1 Economic incentives

According to the assessment of the OECD (s. a.), incentives are defined as measures making use of the price system and market forces to achieve an objective. These incentives can be designed with regards to three target groups of actors (OECD s. a.) clustered according to their effect on or benefit from biodiversity[6] :

(1) actors who actively promote and potentially pay for biodiversity conservation, e. g. pro-environmental farmers, landowners or NGOs (we could call this group "conservationists")
(2) actors who derive some form of benefit from biodiversity, e. g. tourists seeking for relaxation in a biodiverse landscape (we could call this group "beneficiaries")
(3) actors who negatively affect biodiversity and in consequence the outputs or needs of group 1 and 2 (we could call this group "polluters")

Referring to the well-known principle of "carrots vs. sticks" (e. g.: Hilbe and Sigmund 2010), incentives include approaches both directly rewarding desirable and punishing non-desirable behaviour. The former category of incentives – so-called "*positive incentives*" – comprise common approaches such as Payments for Environmental Services, Direct Compensation Payments, Auction Contracts for Conservation, as well as multiple taxative and fiscal privileges motivating various actors to conserve biodiversity (Pascual and Perrings 2007; OECD s. a.). In contrast, the latter category – so-called "*disincentives*" – includes fees for non-compliance or environmental damages internalising the consequential costs and thus potentially provoking behavioural change (OECD s. a.). Whereas positive incentives rewarding group (1) are in accordance with provider-based economic approaches as defined by Mauerhofer et al., (2013), disincentives – similar to regulation – can be regarded as being in accordance with the "*polluter-pays-principle*" (Mauerhofer et al. 2013), punishing group (3) or at least calling group (2) to account for the usage of nature. In addition to positive incentives and disincentives directly targeting biodiversity issues, *indirect incentives* creating biodiversity-friendly market and trade conditions such as emission trading may have further effect on the biodiversity-related behaviour of relevant actors (OECD s. a.). The *removal of perverse incentives* – mostly unintended side-effects of other incentives or regulations which harm nature conservation – can be regarded as the fourth category of pro-biodiversity incentives (OECD s. a.).

[6] Please consider: This definition might lead to some overlaps, i. e. one person might have highly different effects or benefits on/from biodiversity even in everyday life. For example, a farmer can protect as well as harm on-farm biodiversity but also value the aesthetic, diverse landscape and economically benefit from pollination.

With regards to the SHOWCASE's focus on reinforcing synergies between agriculture and biodiversity, the design of initiatives for the SHOWCASE EBAs will mainly have to be based on *positive incentives* further promoting such environmentally and economically promising interactions provided by group (1). Based on the following examples of positive incentives, this approach shall therefore be portrayed in more detail:

> Payments for Environmental Services (PES): According to the definition by Wunder (2005), PES include a transaction between the provider securing the provision of a well-defined environmental service or land-use likely to provide this service on the one hand and at least one buyer on the other hand. This approach implies voluntary choices (Wunder 2005), i.e, farmers may decide if they want to participate in a PES or if they want to apply other forms of – e. g. primarily yield-oriented – land uses. Agri-environmental and climate measures within the 2nd pillar of the EU-Common Agricultural Policy (CAP) can be regarded as prominent examples of PES. In this context, PES don't directly remunerate the services provided but, as written by Kleijn and Sutherland (2003) compensate for any loss of income (e. g. due to the reduction of yield, management costs, opportunity costs) as a consequence of implementing pro-biodiversity management measures.
>
> If other than financial forms of compensation are provided for the delivery of ecosystem services (e. g.: knowledge transfer, public recognition), this approach is termed "Rewards for Ecosystem Services" (RES) (Pascual and Perrings 2007). In Table 2 (Chapter 6) on existing private and public incentive schemes targeting biodiversity enhancement in agriculture, the following initiatives can, for example, be classified as belonging to RES: ORG4, N-EU7, N-EU8.
>
> Direct Compensation Payments: These payments are a special case of P(R)ES. They compensate farmers for taking their land out of production and dedicating it to nature conservation (Pascual and Perrings 2007). For examples, please see N-EU10 in Table 2 (Chapter 6).
>
> Auction contracts for conservation: This approach is based on an auction or competitive bidding mechanism with farmers trying to win a conservation contract fromthe government at a price which shall reveal the real costs of pro-biodiversity farming practices (Pascual and Perrings 2007). For an example, please see N-EU13 in Table 2 (Chapter 6).

Generally, the various forms of incentives can be issued both by **governmental organisations and by the private sector**. In order to engage the private sector in decision making, economically attractive opportunities – e. g. reinforced through tax reliefs or publicity – are required (IUCN 2000). Eco-labelling is one of the most well-known and promising of such approaches. Although being classified as "indirect incentive" according to the OECD (s. a.), it shows essential similarities with PES as being voluntary and contractual market-based instruments (Le Coq et al. 2011). Through engaging various actors along the food supply chain, eco-labelling can be regarded as a win-win-situation for biodiversity conservation, private enterprises in the food sector as well as farmers producing food in a sustainable way: Eco-labels lead to an advertisement surplus for enterprises, educate consumers and allow them to make consuming decisions favouring "green" products which in consequence creates market incentives for biodiversity conservation (Bowles et al. 1998).

4.2 Partnerships and networks

According to the summarized definition by Bauer and Steurer (2014), partnerships can be regarded as non-hierarchical alliances that are self-organizing between actors from one or multiple levels of government, market and/or civil society actors pursuing common goals by sharing resources, skills and risk. This can be an essential incentive to adopt certain behaviour.

Depending on their target, these partnerships can be categorized along two scales (Boulton 2013):

- Depending on who starts the activity, the partnership can be **bottom-up** when being initiated by farmers, **evolved** when independent activities are brought together by a third person, or **top-down** when being initiated by an institution delivering public policy.
- Depending on the way how different actors cooperate, the partnership can be **collaborative** including intensive exchange between partners in order to achieve the desired outcomes or **coordinated** with partners working in isolation towards the desired outcome but receiving supported from external facilitators.

For an overview of the suitability of different partnership approaches, please see figure 1 which was taken from Prager (2015).

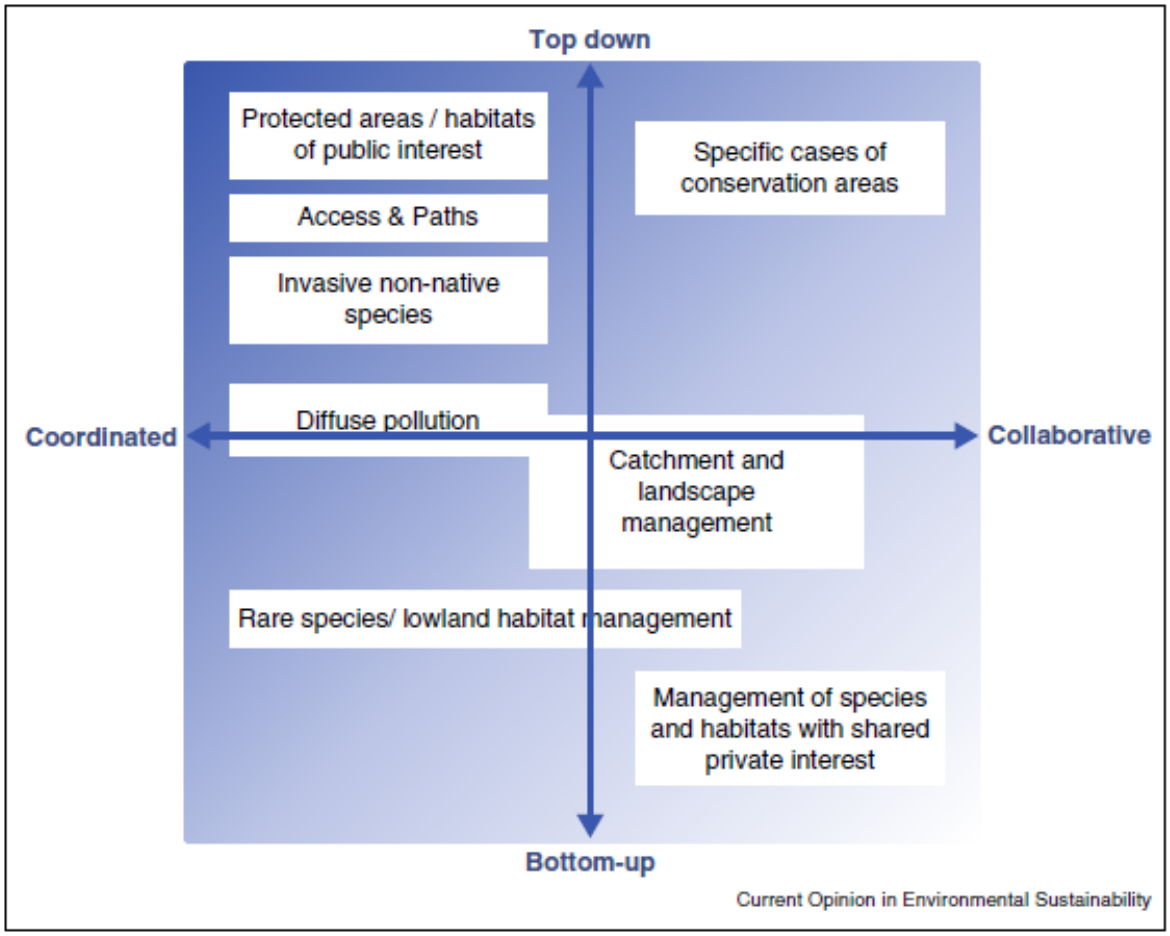


Figure 1: Suitability of different partnership approaches, Prager (2015)

4.3 Incentive approaches within common European policies

Within the EU, biodiversity protection shows a rising importance which is reflected – additionally to regulations – in various environmental strategies as well as financial instruments. Whereas strategies such as the already mentioned European Green Deal, the EU Biodiversity Strategy 2030 and the Climate Change Adaptation Strategy (Interreg Europe Policy Learning Platform 2020) provide merely the frame for corresponding activities, initiatives and measures, the financial instruments as summarized in the following passage act as directly incentivizing (governance) mechanisms (Interreg Europe Policy Learning Platform 2020):

- European Structural Investment Funds
- Common Agricultural Policy (CAP)
- European Maritime and Fisheries Fund
- LIFE Environment sub programme funding nature conservation projects
- Natural Capital Financing Facility being co-funded by the European Investment Bank and comprising projects on PES and biodiversity offsets
- Horizon 2020/Horizon Europe enabling evidence-based research considering multiple actors
- Next generation EU focusing the green and digital transition and resilience by, e. g., supporting biodiversity and ecosystem conservation

With the focus of the SHOWCASE project being on agriculture, it is the biodiversity-related incentive schemes of the Common Agricultural Policy which are most relevant to mention here. In the current CAP, the "green architecture" of the farming policy is composed of the following threefold approach: **Cross-compliance** rules (I) such as compliance with biodiversity conservation and environmental protection directives must be met by CAP beneficiaries (European Commission s. a.a). **Green direct payments** (II) are granted to farmers for respecting some basic requirements: protection of permanent grassland, crop diversification and Ecological focus areas (i. e. catch crops, nitrogen fixing crops and fallow land) (European Commission s. a.a). **Rural development** (III) as the third element not only includes some payments that are directly related to the implementation of the Birds and Habitats Directive, potentially pro-biodiversity investments and organic farming support but also agri-environmental-climate measures (AECMs) (see above) (European Commission s. a.a).

Through different mechanisms, farmers not complying with the requirements set out in these three layers can lose part of their CAP subsidies, so all have some kind of economic reward attached. Nevertheless, it is only Element (III) that operates truly as a voluntary incentive-based scheme belonging to PES. As discussed in Chapter 3 above, Elements (I) and (II) in practice set the regulatory baseline that all farmers receiving direct payments from the CAP must respect, irrespectively of their being attached more or less explicitly to a payment.

Forthcoming changes in the CAP 2023-2027

With regards to the new CAP planned for 2023 to 2027, a different governance and green architecture model is being set up. Based on nine objectives, with one of them focused on biodiversity, ecosystems services and habitats and landscapes (see also chapter 1), EU member states are obliged to design strategic plans (European Commission s. a.b). Similar to a result-based approach on national instead of farm-level, these plans shall consider individual needs, suggest a variety of interventions potentially meeting the needs and finally deliver corresponding results (European Commission s. a.c). Additionally, a new green architecture will be established with the discontinuation of green direct payments and the rolling out of so-called **eco-schemes,** one of the very few novel instruments available in the toolbox of the CAP 2023-2027. Due to their novelty, this instrument shall be portrayed in more detail in the following passages.

As part of the CAP first-pillar direct payments, eco-schemes will be fully funded by the EU and take the form of yearly payments to farmers who voluntarily enrol in them. Rather than using CAP direct payments to farmers as just income support, the aim of eco-schemes is to reward those farmers who are already managing land in a nature-friendly way, and to incentivise the adoption of specific farming practices with higher climate, environmental, or biodiversity benefits, as well as interventions to improve animal welfare and combat antimicrobial resistance.

Substantial funding from the CAP will be devoted to eco-schemes, approximately one quarter of all direct payments to farmers, which adds up to some €8-9 bn per year across the EU. This is expected to trigger large interest for adoption, with potentially a very high proportion of CAP

beneficiaries enrolling in them, even if they are designed and presented as a fully voluntary systems of incentives.

After the failure of the current CAP greening payments, which were the first attempt to use direct payments for agri-environmental purposes but only led to changes in farming practices on around 5% of all EU agricultural land, high expectations are now set on eco-schemes. To realise their full potential, eco-schemes could learn from the CAP greening experience to avoid two major pitfalls: they should not be used to pay for basic farming practices, nor as a flat-rate payment for all farmers (WWF-European Policy Office 2020b).

The European Commission published in January 2021 a factsheet with a *List of potential agricultural practices that eco-schemes could support*[7] to inform and guide the design of CAP national strategic plans by Member States. As regards biodiversity, 20 out of the 45 practices proposed are explicitly identified as contributing to that objective, with several of them having it as a central element:

- Agro-ecology, including i) mixed species/diverse sward of permanent grassland and ii) lying fallow with species composition for biodiversity purpose (pollination, birds, game feedstocks).
- Agroforestry, including the establishment and maintenance of i) landscape features and ii) high-biodiversity silvo-pastoral systems
- High nature value (HNV) farming, including i) shepherding on open spaces and between permanent crops, transhumance and common grazing; ii) semi-natural habitat creation and enhancement; and iii) Reduction of fertiliser use, low intensity management in arable crops.

At the time of finalising of this report in October 2021, Member States are in the process of designing their CAP national strategic plans, including the eco-schemes that they will implement. These plans are due for submission by the end of 2021. After being reviewed by the Commission, a revised version of the plans will have to be submitted in 2022 for final approval, so they can enter into force in 2023. Therefore, the information available about the future eco-schemes is still very sketchy and subject to change.

Nevertheless, a compilation of information conducted by NGOs has allowed us to produce the following list, which gathers some of the draft eco-schemes being designed by Member States with primarily a biodiversity orientation.

DRAFT BIODIVERSITY ECO-SCHEMES PROPOSALS FOR CAP 2023-2027

BELGIUM – Wallonia. Ecological network, based on the percentage of agricultural land with landscape elements on the farm.

BELGIUM – Flanders. Yearly buffer strips and ecologically friendly crops such as n-fixing crops, herb-rich grasslands, etc.

BULGARIA. Maintenance and improvement of biodiversity and ecological infrastructure; Extensive maintenance of permanent grassland with grazing animals; Maintenance and improvement of the biodiversity in forest ecosystems.

CROATIA. Grazing on karst grasslands, with minimum and maximum stocking rates.

DENMARK. Fallow land and small habitats, building on the 3-4% of conditionality to reach 7%.

ESTONIA. Ecological areas, with payments for creating and keeping of more landscape features on farms; Honeybee feeding areas, with the sowing of flowering plants suitable for bees.

FINLAND. Nature management of fields; Biodiversity eco-scheme.

[7] Available online here.

FRANCE. Biodiversity and agricultural landscapes, based on the share of agro-ecological infrastructure on the farms.

GERMANY. Non-productive areas and landscape features; Extensive grassland on the whole farm; Retention of agro-forestry; Result-based biodiversity measure through four plant species.

IRELAND. Non-productive areas and landscape features; Planting of native trees.

ITALY. Sustainable management of meadows and pastures, with the application of grazing and mowing plans.

LATVIA. Areas of ecological importance, including interventions like melliferous plants, fallow land, intercropping; Promotion of the conservation of grasslands in livestock farms.

LITHUANIA. Point system eco-scheme including biodiversity rich landscape elements; Grazing and mowing of meadows and grasslands.

THE NETHERLANDS. Grassland border strips; Hedgerows; Herb-rich grasslands; Maintaining woody elements like small bushes.

POLAND. Areas of melliferous plants; Extensive grazing of permanent grasslands; Maintenance of mid-field trees and of agroforestry systems; Non-productive areas on the farm.

SLOVAKIA. Whole farm eco-schemes including items related to biodiversity, like non-productive elements, delayed mowing/grazing, etc.

SLOVENIA. Sowing of honey plants; Skylark plots; Preserving of landscape features; Green buffer zones along watercourses.

SPAIN. Non-productive areas and landscape features, with different rates depending on the type of crop; Sustainable meadow mowing or leaving uncut margins.

SWEDEN. Flower strips for pollinators.

These draft eco-schemes will still have to be revised, fine-tuned and approved, and some may be dropped or significantly redrafted in the process. Accordingly, it may be worth coming back to this topic at a later stage of the SHOWCASE project, in particular to assess how the novel eco-schemes may be influencing the Experimental Biodiversity Areas (EBAs) of the project, and the perception of farmers on these new system of incentives under the CAP.

5 Combination of regulatory frameworks and incentives

On most occasions, the signals a farmer operating in the EU receives in relation to biodiversity-friendly farm management are a combination of regulatory frameworks and incentives.

The regulatory framework is not only established by the EU and national biodiversity legislation, but also by the Common Agricultural Policy itself, as it also establishes basic rules that *de facto* operate as the baseline for all farmers receiving CAP subsidies. As regards incentives, multiple mechanisms have been described in Section 4, but some of the strongest monetary incentives (and in some cases disincentives) also come from the CAP, as it is a powerful agricultural policy that absorbs one third of the EU budget.

To review how the combination of regulation and incentives can operate in favour of biodiversity, and particularly to explore some of the trade-offs between them, grey literature and European Commission publications related to farming for biodiversity have been reviewed. In the section below, we put a specific focus on biodiversity-friendly farming in Natura 2000 sites, as central exemplary areas of continuous and long-lasting efforts in biodiversity conservation. This is followed by revising some of the main conclusions from the grey literature assessing the performance of the CAP in relation to biodiversity.

5.1 Stricter regulation or better incentives: what works best for biodiversity-friendly farming in Natura 2000 sites?

5.1.1 Farming for Natura 2000

The concept of High Nature Value (HNV) farming developed in the early 1990s from a growing recognition that the conservation of biodiversity in Europe depends, among other, on the continuation of traditional low-intensity farming systems. The cornerstone of HNV farming, and indeed of European farmland biodiversity, are semi-natural pastures and meadows, as well as some low-intensity arable land, groves or orchards, especially when combined with landscape features such as large hedges, copses, stone walls or ponds.

This largely semi-natural farmland provides a mosaic of habitats and an essential green infrastructure for wildlife, attracting a wide range of species of fauna and flora, many of which are nowadays protected under the Habitats and Birds Directives. A central element of these Nature Directives is the EU-wide Natura 2000 Network of sites, which must be managed and protected to ensure the conservation of the habitats and species of Community interest.

Replaced by expanding intensive agriculture in large parts of the European territory, HNV farms nowadays often operate on less productive agricultural land, frequently in mountainous regions and within nature protection areas. As a result of this process, farmland biodiversity has dramatically decreased in intensively managed agricultural areas, while it is still a prominent feature in many terrestrial Natura 2000 sites, with roughly 40% of their total area constituted by farmland.

The conservation of species and habitats that are dependent on, or associated with, agricultural practices, constitutes a major challenge in many protected areas. In most cases, it is equally important to prevent the encroachment of, and management shifts towards, intensive farming practices, as it is to avoid the abandonment of the agricultural practices that are so beneficial to farmland biodiversity.

At the crossroads of EU agricultural and biodiversity policies, which have very different planning and funding tools, it is not straightforward to identify the best policy implementation choices for the preservation of high nature value farming and its associated wildlife. From strict enforcement of law to protect valuable habitats and species, to offering economic rewards to

farmers for biodiversity-friendly practices, a careful balance between regulation and incentives is needed in most situations to achieve the desired conservation outcomes.

Well aware of these challenges, back in 2014 the European Commission published the "Farming for Natura 2000" guidance document on how to support farming systems to achieve conservation objectives. The document focused mostly on how to give the right support to the farmers who are doing "the right thing". In this regard, authors underline that it is first necessary to ensure the economic viability of the extensive farming system on which the beneficial management practice depends, and then look into the specific management practices needed for the conservation of the key habitats and species.

As mentioned in Section 3, the Birds and Habitats directives include a number of obligations for Member States to preserve EU biodiversity, especially within the Natura 2000 network. One important feature of these directives is that they do not make a difference between basic and supplementary measures, as the EU nitrates directive or Water framework directive does. This blurs somewhat the distinction between what can be considered legal minimum requirements for all people and land managers to comply with, and what are the additional actions which could be rewarded or incentivised.

Therefore, the situation on the ground largely depends on the implementation choices made by Member States or regions, with options ranging from hardly establishing any basic requirement and working mainly with voluntary contractual approaches (as is the case in France, for instance) to considering most biodiversity conservation measures as legal obligations, as it seems to be the case in some Eastern European countries. One option is not necessarily better than the other, as a fine balance needs to be struck to achieve the desired conservation objectives.

Out of the 72 Annex I priority habitats in the Habitats Directive, 23 can be considered to be key farmland habitats because they are dependent on or associated with extensive agricultural practices. Similarly, 62 of the 194 bird species classified as particularly threatened in the Birds Directive, and 197 non-bird species or subspecies in the Habitats Directive can be considered key farmland species. A large majority of these 259 farmland species are mainly associated with grasslands, while less than 20% of them are related to extensive agricultural crop lands.

The pressures affecting these habitats and species are diverse, ranging from lack of appropriate management, when livestock grazing, hay cutting or shepherding are declining or insufficient, to some form of intensification of farming, such as increased fertilisation or liming, reseeding, drainage, change in grazing or mowing regimes, or even afforestation or conversion to arable land in some cases. Loss of habitat diversity and of biodiversity-rich landscape features are equally important threats.

In most circumstances, the Common Agricultural Policy (CAP) is the main EU funding tool that can orient, support or restrict (by its sanctioning mechanisms) certain farming practices, so that biodiversity objectives are achieved. It must be noted that in the current policy framework, a major factor determining the viability of biodiversity-friendly farms is whether they are receiving sufficient income support through the Common Agricultural Policy. For different

reasons, including intricate issues of entitlements and land eligibility for direct payments[8], low-intensity Natura 2000 farms may be receiving lower CAP income support than farm holdings located on more productive agricultural land, with whom they compete when marketing their products. If this makes the farming system as a whole uneconomic, simply providing support for the management of specific habitats and features may not be sufficient to ensure that these practices continue.

Other than the Common Agricultural Policy, LIFE funds can also finance very specific, targeted farming for conservation measures. And other EU funds could potentially be mobilised with a similar objective, but generally at a very limited scale if we compare them with the leverage of the CAP.

5.1.2 The CAP toolbox for Natura 2000

The "Farming for Natura 2000" guidance document offers an excellent overview of the multiple tools that can and should be combined to support biodiversity-friendly farming practices in Natura 2000. Additionally, through the European Network of Rural Development, DG Agriculture and DG Environment organised a joint workshop on Natura 2000 in 2017, focusing on implementation of Natura 2000 related measures in RDPs, to discuss lessons learnt and share good practice examples from a number of Member States.

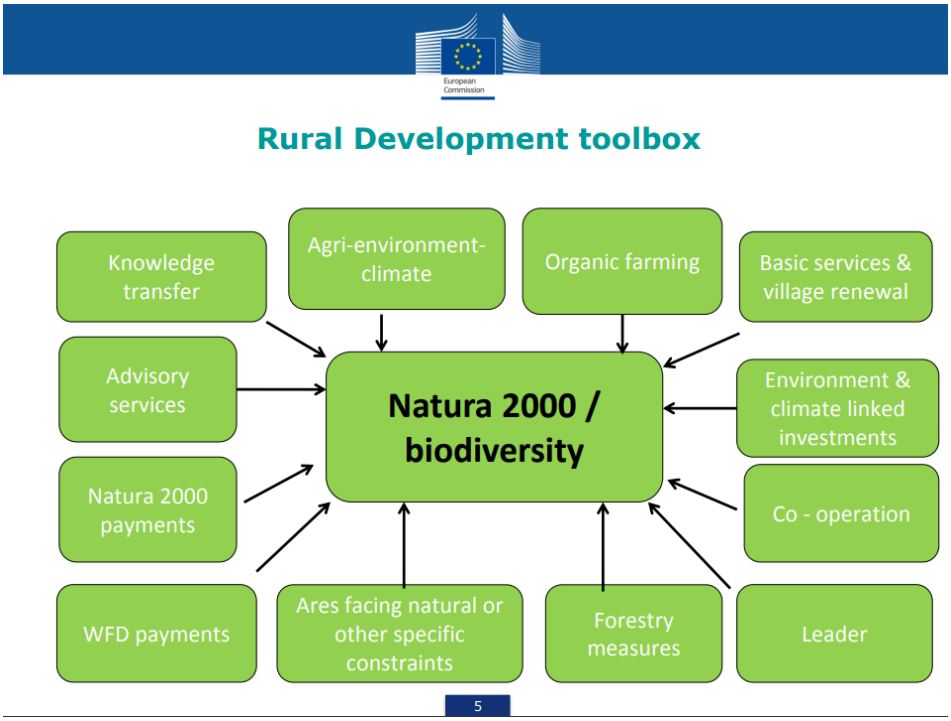


Figure 2: Slide showing the multiple Rural Development interventions that can support Natura 2000, extracted from this European Commission presentation at the ENRD workshop (Sulima s. a.).

[8] It must be noted that Member State records of Utilised Agricultural Area (UAA) may not capture all Natura 2000 (or HNV) farmland, and in some cases considerable areas of key habitats managed by farmers are not recorded as UAA.

These publications show that the tools are largely there and this will continue to be the case in the future CAP, as only minor changes are made to the Rural Development toolbox. However, there are three aspects which are possibly worth exploring further in relation to the future CAP and Natura 2000, namely:

1. CAP conditionality provisions, to assess if there are any changes relevant for Natura 2000 made to this set of do-no-harm requirements.
2. Payments under Rural Development interventions, notably those targeting Natura 2000 more directly.
3. Novelties in the system of direct payments, notably in relation to changes in the eligibility of farmland and the potential use of eco-schemes for Natura 2000.

Conditionality for Natura 2000 in the CAP

As presented in Section 3, some articles of the Birds and Habitats directives are part of the CAP conditionality, but due to implementation differences, the implications of these standards for land managers receiving CAP support can differ significantly across Member States. In the future CAP, there are two other conditionality standards which are a novelty and which refer directly to Natura 2000. Firstly, there is the Sustainable Use of Pesticides Directive standard SMR 13, which will apply in relation to restrictions in the use of pesticides in protected areas defined on the basis of the Water Framework Directive and Natura 2000 legislation (Article 12 of the SUPD).

The second novelty is GAEC 9 on permanent grasslands, which has been amended by co-legislators, with the Council proposed text likely to be kept after the trilogues, as follows: *GAEC 9. Ban on converting or ploughing permanent grassland designated as environmentally-sensitively permanent grasslands in Natura 2000 sites.* This is basically a continuation of one of the current requirements to receive CAP greening payments (which will end with the current CAP in 2022), with the difference that it will no longer be of application to environmentally-sensitive permanent grasslands (ESPGs) located outside Natura 2000 sites.

This change is undoubtedly a lowering of the previous requirement, but it must be noted that there were only five (relatively small) Member States who had established ESPGs outside Natura 2000 in 2016 (CZ, LV, LT, UK-Wales, BE-Flanders), according to this Greening evaluation study (European Commission 2017). In any case, the implications of this GAEC 9 are substantially different across Member States as, according to that same study, some have defined as ESPG all their Natura 2000 grasslands (BG, CZ, EL, HU, IT, NL, FI, SK) and others less than 25% of them (AT, BE, DK, EE, IE, LU, LV, PT).

Rural Development interventions for Natura 2000

Within the Rural Development pillar of the CAP, the Natura 2000 and Water Framework Directive payments (N2K-WFD Measure 12 in current RDPs) are obviously the ones most directly targeted to Natura 2000. The current use of these payments has been assessed by the European Network for Rural Development (s. a.), concluding that approximately half of the RDPs have programmed this scheme, but overall with a very low budget allocation.

Most of the use of M12 is to compensate farmers (or sometimes forest owners) for restrictions in management, such as limits to carrying capacity, zero or reduced fertilising of grasslands or restrictions in wood cutting. In some cases, the restrictions are quite generic, and other times related to the conservation needs of a species or a habitat. While management plans for Natura 2000 sites make the use of this measure more straightforward, it is not a requirement in itself, provided there is a legally valid definition of the sites, habitats or species that can define the restrictions to be applied. The measure can also be applied outside Natura 2000 for connectivity purposes.

It is interesting to note that for N2K schemes, which will continue largely unaltered in the future CAP under the name of "Area-specific disadvantages resulting from certain mandatory requirements", the reference baseline is not all conditionality standards, but just the Good Agricultural and Environmental Standards (GAECs). Indeed, the text of the article regulating this measure clearly establishes that payments are to compensate farmers (or other land managers) for mandatory requirements resulting from the implementation of the Birds, Habitats and Water Framework Directives.

As a result of this, basically any N2K-related restriction could be compensated through this measure, other than the no ploughing or conversion of environmentally-sensitive permanent grasslands, as this will now be covered by GAEC 9[9]. The weakness in the definition of ESPGs, and their no applicability outside Natura 2000 will likely create an implementation complexity not well justified by conservation objectives, and can be perceived as unfair for farmers operating primarily on ESPGs in Natura 2000 areas, as they will face a management restriction which may not be too relevant in their areas, but that it is not compensated in any way.

For comparative purposes, the baseline for agri-environment-climate schemes (AECMs, Measure 10 in current RDPs, named *Environmental, climate and other management commitments* in the future CAP) are both SMRs and GAECs, as well as any other mandatory requirements established by national and Union law. However, this has by no means implied a more limited use of AECMs for Natura 2000. Quite the contrary, they have been extensively used to support farming for conservation, including to compensate for relatively basic restrictions in management when these were not implemented as a legal obligation in the Member States, as well as to support specific actions for species and habitats of the Nature Directives. One advantage of AECMs is that they offer a top-up payment when an AECM is implemented collectively, as certain biodiversity needs are best addressed by scaling up interventions at the landscape level.

When comparing the N2K measure with AECMs, the authors of the Farming for Natura 2000 guidance point that: *Although farmers can be compensated for the legal requirements, these Natura 2000 payments are not able to support positive restoration management to the same extent as agri-environment-climate payments. The M12 payment is a simple annual payment and works best when it pays for the costs incurred by a simple management restriction, e.g. no fertiliser and pesticides, grassland can only be cut once and features such as scrub hedges, etc. must be retained, or in forest only so many trees can be cut down and no veteran trees. Then the agri-environment scheme pays for positive improvements that are more targeted at specific habitats and species, or for a more differentiated cutting regime.*

Some of the most effective RDPs for Natura 2000 allow farmers to combine the N2K payment with a targeted agri-environment contract and, when applicable, also the organic farming payment. In the cases where these commitments partly overlap, payments are appropriately adjusted by the management authority. In numerous RDPs, the implementation of AECMs is prioritised in Natura 2000, either by offering specific schemes for protected sites, or by deliberately offering a higher payment rate for the same scheme inside sites versus outside, in order to get more farmers within the sites to sign up for schemes.

In the past, the N2K-WFD schemes were partly constrained by several features: the payment levels were lower than for AECMs (even if some basic management restriction can be very costly for farmers), they could not cover transaction costs (while AECMs can), and when implemented for the WFD, they did not count as environmental expenditure. In the future "Area-

[9] Similarly, Water Framework Directive related restrictions can be compensated with this measure, excluding those deriving from the implementation of the Nitrates Directive, and with the exception of those elements covered by GAECs, notably the buffer strips defined in GAEC4.

specific disadvantages resulting from certain mandatory requirements", these elements will most likely be discontinued, which will hopefully lead to a more generalised programming of the measures, with higher budget allocation and uptake.

Overall, it can be concluded that when there is political will and an adequate technical justification and design, Rural Development interventions can be combined with the CAP conditionality in a very effective way for Natura 2000, restricting certain negative practices, sometimes without and sometimes with an economic compensation, as well as incentivising positive management and biodiversity-friendly farming practices.

Direct payments: farmland eligibility and use of eco-schemes for Natura 2000

In the debate on the future of the CAP, eco-schemes have captured much of the attention, as it is one of the few novel tools proposed for the next CAP, designed to replace the (largely failed) CAP greening payments with a different, more customisable type of intervention.

While the draft regulations proposed by the Commission were timid on eco-schemes (no funds were ring-fenced for them) and focused on the "enhanced conditionality" as the main tool to deliver a higher environmental and climate ambition, co-legislators have turned things around. Rather than putting additional rules on farmers (the enhanced conditionality was perceived as such) they have preferred to broadly maintain current rules and put the emphasis on the incentive-based approach that eco-schemes offer.

Given the political agreement reached by the Council of the EU and the European Parliament, eco-schemes will receive approximately 25% of the CAP direct payments envelope in every Member State, adding up to €9 bn per year across the EU. Despite this large budget and the associated capacity to orient farming practices, it is still very uncertain whether eco-schemes will perform well and to what extent they will have a positive impact on biodiversity.

Initially designed to be focused on three climate and environmental specific objectives of the CAP (one of which is biodiversity), the final agreement expanded their scope to also cover animal welfare and combatting antimicrobial resistance. The eco-schemes factsheet published by the European Commission in January 2021 (European Commission 2021a) shows that biodiversity-relevant farming practices are part of the examples provided for potential support through eco-schemes, but within a very large set of options. Therefore, as it happens with Rural Development interventions, much will depend on the choices Member States make when designing their CAP strategic plans.

Another major feature of CAP direct payments are the definitions and requirements determining farmland eligibility for all direct payments, including eco-schemes. While not directly related to specific farming practices, land eligibility continues to be an additional challenge faced by many Natura 2000 farmers. This is especially the case of livestock farmers who graze their animals on areas with abundant woody vegetation, including woodlands, which frequently do not fit in the standard definitions of eligible land to claim CAP support. As a result, they can claim less farmland than they actually use, and this usually implies receiving a lower level of direct payments.

The EU-CAP framework determining land eligibility will be more flexible for Member States in the CAP 2023-2027 than it currently is. Overall, there is a willingness to make landscape features more easily eligible, but certain arbitrary limits set by the Member States could lead again to the exclusion of large grazing areas. Interestingly, the new CAP regulations include a provision for offering some further flexibility for farmland which was eligible for direct payments in the past but no longer complies with the eligibility conditions as a result of the implementation of the Birds, Habitats and Water framework directives.

Independently of this increased flexibility, in most countries there will likely be a tendency to maintain similar land eligibility rules than currently apply, and to limit the number of entitlements to direct payments, mostly due to the fear that CAP money could shift away from more

intensive lowland farmers to more extensive ones. The use of exemptions and flexibility to better accommodate Natura 2000 farmland in the CAP framework will, once again, be left to the willingness and capacity of Member States to undertake such an endeavour, facing the likely opposition of farm unions defending other interests.

5.1.3 Prioritised action frameworks for Natura 2000 and the CAP

One of the planning tools deriving from the Habitats Directive, Art. 8(1) are Prioritised Action Frameworks (PAFs). These are strategic multi-annual planning tools, aimed at providing a comprehensive overview of the measures that are needed to implement the Natura 2000 network and its associated green infrastructure, specifying the financing needs for these measures and linking them to the corresponding EU funding programmes.

As the future CAP regulations include an obligation for Member States to take into account environmental planning tools like the PAFs, as well as species-habitats-sites management plans, the drafting process of CAP strategic plans has the potential to better take into account biodiversity needs. To explore the full potential of this new procedural requirement, the European Commission (2021b) has recently published the report Linking the planning tools emanating from EU environmental legislation and policies with funding mechanisms.

This report looks into planning tools emanating from Air pollution, Water and Biodiversity legislation, based on case studies from a number of EU countries and regions. As regards Prioritised Action Frameworks, the table below (see figure 3 directly taken from the report) summarises those considered. Additionally, five Natura 2000 site plans were assessed in 10 Member States.

The analysis of each of the cases is interesting in itself but overall the most common situation is that measure descriptions found in these planning tools are generally not sufficiently detailed to be directly included in CAP strategic plans. This is particularly the case for PAFs, which do identify some higher level needs (e.g., grassland management for biodiversity), but not always go into the full detail needed, such as what areas should be covered by the measures and who should be the beneficiaries.

Final Report: Linking the planning tools emanating from EU environmental legislation and policies with funding mechanisms

MS	Scale	Status	Funding period
BE	Regional (Flanders)	Draft	2021-2027
	Regional (Wallonia)	Draft	2021-2027
DE	National	Final	2014-2020
IE	National	Draft	2021-2027
ES	Regional (Andalusia)	Draft	2021-2027
	Regional (Balearic Island)	Draft	2021-2027
	Regional (Castilla La Mancha)	Draft	2021-2027
FR	National	Final	2014-2020
IT	*Draft PAFs 2021-27 not available; none reviewed*		
NL	*No PAF available for review*		
AT	National	Draft	2021-2027
PL	National	Draft	2021-2027
RO	National	Draft	2021-2027
SE	*Draft PAF 2021-27 not available; no PAF reviewed*		

Figure 3: Prioritised Action Frameworks analysed in the European Commission (2021b) report

All in all, this new provision creates the space for better integration of biodiversity needs in the CAP but for its potential to be realised, it is of utmost importance that Nature protection authorities get directly involved in the CAP strategic plans process, and closely collaborate with their Agriculture colleagues. As the assessment of needs and the overall orientation are

generally well established, the focus of this collaboration should be on defining the additional details needed for biodiversity measures to be implementable under the CAP.

5.2 Overall assessment of the current CAP impact on biodiversity

The European Commission publication Evaluation of the impact of the CAP on habitats, landscapes, biodiversity (European Commission 2019), is possibly the most comprehensive assessment to date of the successes and failures of the CAP 2014-2022 for biodiversity. Prepared by Alliance Environnement (i.e., the Institute for European Environmental Policy and Oréade-Brèche Sarl) for the European Commission, this evaluation report was completed in November 2019.

The geographic scope of the study is the whole European Union, with case studies in 10 Member States. All types of biodiversity are considered, with some additional focus on species and habitats from the Birds and Habitats Directives. Additionally, the report also covers landscape attributes (e.g., connectivity) that play a role in supporting biodiversity. Please see figure 4 directly taken from this report for an overview.

Table 2: Agricultural habitats in the EU, their importance for selected threatened habitats and species, and their overall biodiversity

	Permanent grassland and other habitats grazed by livestock					Crops					
Habitat types	Natural habitats	Semi-natural habitats		Improved grassland		Cultivated			Permanent		
		Pastures	Meadows	Organic	Conventional	Extensive	Organic	Intensive	Extensive	Organic	Intensive
HD Annex I habitats*1	63										
BD Annex I birds*2	54			32					5		
HD Annex II Butterflies*3	9	25		0	0	0	0	0	0	0	0
European threatened amphibians*4	3	5		0		1	0		0	0	
European threatened reptiles*5	1	4		0		0	0		4	0	
Overall biodiversity importance	Very high, many species are restricted to such habitats	Very high, these habitats tend to be species-rich and declining; some species are restricted to such habitats and dependant on specific agricultural practices		Moderate, species diversity is much reduced compared to natural and semi-natural habitats, but some species of conservation importance use such habitats, sometimes in important numbers		High, such habitats are now rare and support some threatened species (esp. birds)	Low, especially in intensive farmland dominated landscapes, but biodiversity levels can be enhanced by appropriate measures		Moderate - High, such habitats are declining and support some threatened species	Low, especially in intensive farmland dominated landscapes, but biodiversity levels can be enhanced by appropriate measures	

Source: Poláková et al (2011). 1 Halada et al (2011); 2 adapted from Tucker and Evans (1997); 3 adapted from Van Swaay, Warren and Lois (2006) using updated annexes available from Butterfly Conservation Europe (http://www.bc-europe.org/upload/Butterfly%20habitats%20-%20Appendix%201.pdf): 4 Temple and Cox (2009); 5 Cox and Temple (2009). Note: Habitat divisions for each taxa group reflect the habitat types distinguished in the available data.

Figure 4: Importance for biodiversity of different agricultural habitats in the EU (European Commission 2019)

Reading the full report is recommended for anyone wanting to delve into the full detail, but for the purposes of this overview and to inform other work in the SHOWCASE project we highlight the following elements:

1. **Types of agricultural management**. As a general approach to assessing the interactions of farming with biodiversity, the report distinguishes three main types of management for crop production: intensive, organic, and extensive. A similar logic applies to grasslands, with natural or semi-natural habitats largely being managed in an extensive way. Based on the existing literature, it is generally presumed that extensive forms of farming host the highest biodiversity levels. Under more intensive management, organic farming is generally assessed as outperforming conventional farming, unless the latter is accompanied by other beneficial measures (field margins, fallow land, hedgerows, etc.).
2. **Key priorities in implementation choices**. Much of the success of the CAP in relation to biodiversity depends on the choices made by Member States and Regions within the flexibility granted by CAP regulations, but this is mainly driven by socio-economic or financial-administrative priorities. This is the case for most CAP interventions, and even within the well-established Agri-Environmental and Climate Measures of the Rural

Development Programmes, where socio-economic support to farmers sometimes prevailed over environmental objectives.

3. **Inclusion of novel schemes through environmental authorities**. There are some good exceptions to the previous point. In one German region, for instance, the Nature conservation strategy for the region had just been produced which set out clear goals and identified the CAP measures that would be best placed to meet these, assisting greatly with the design of the regional Rural Development Programme. More generally, the continuation of existing schemes –with just the needed adjustments- is the norm.
4. **Factors influencing the engagement by farmers**. Generally, it is a combination of financial factors (low payment rates have sometimes led to failed scheme uptake), policy design and degree-of-fit with existing practices (whether it is a large effort compared to current practice), environmental awareness and market developments (e.g., growth in demand for organic products) that are the factors that appear to influence engagement of farmers with environmental measures the most.
5. **Greening payments are not delivering much on biodiversity**. From a biodiversity perspective, the most important achievement of CAP greening is likely the slowing down of the decline in fallow areas, which are crucial for biodiversity on arable land. For grasslands, the designation of "environmentally-sensitive permanent grasslands" under CAP greening, and the associated forbidding to convert and plough them up, has also led to more effective protection in some areas. In most cases, however, these grasslands were already effectively protected by the Natura 2000 network.
6. **Well-designed Agri-Environmental Climate Measures (AECMs) are providing benefits** for their target habitats and species, but they are sometimes constrained by inadequate budgets and/or insufficient uptake by farmers. However, it is difficult to draw overall conclusions given the great variety of AECMs programmed across the EU, their wide range of objectives and the limited data on effectiveness and impact reported by Member States.
7. **The analysis of successful AECMs suggests that effectiveness is greater** when a number of conditions are met, such as when they: i) target the most important farmland for biodiversity, namely natural and semi-natural habitats, ii) are located in the right place, and not where the intervention is not required or is inappropriate, iii) provide a resource that is lacking in simplified farmed landscapes, iv) focus on non-productive or marginal areas, rather than in productive in-field interventions, v) avoid horizontal broad and shallow interventions.
8. **The Natura 2000 payments have not been applied widely** but given that they offer compensation for management restrictions in protected areas, there is high certainty that they provide biodiversity benefits, as they allow rules and management plans to be more ambitious, with interventions in line with what nature authorities have deemed necessary to achieve the conservation objectives of the site.
9. **The conservation of species and habitats from the Nature directives** is also best achieved through the CAP instruments such as AECMs, Natura 2000 payments or Forest measures that allow to target interventions on the most valuable natural and semi-natural habitats. Measures such as Organic farming that work well to boost common and generalist species in more intensively farmed landscapes, have very limited impact on priority habitats and species.
10. **Net impact of the CAP on biodiversity.** The proven or estimated capacity of the very diverse CAP measures to support biodiversity do not allow to conclude with certainty what the net impact of this policy is, or whether the most positive interventions (like AECMs) outweigh the possible detrimental effects of CAP direct payments. Addressing data gaps and improving the process of evidence gathering future is identified as a key recommendation for the future.

All in all, this report shows that the enormous potential of the CAP to support biodiversity-friendly agricultural practices, or to contain any of the impacts of industrial farming on biodiversity, remains largely unrealised. Looking into the future CAP, this short reflection on

the results of the Evaluation report identified several risks of relevance for the 2023-2027 period, such as:

- A continuation of the logic behind the CAP Greening and its Ecological Focus Areas under the future conditionality, despite their failure to deliver on biodiversity.
- No guarantees of increased support to organic farming, while it is identified as one of the best approaches to improve biodiversity in intensively farmed areas.

The lack of strong governance mechanisms to secure sufficient expenditure for biodiversity and guarantee a minimum quality of the measures implemented.

6 Existing private and public incentive schemes targeting biodiversity enhancement in agriculture, emphasizing result-based approaches

This chapter informs on the approach of identifying existing private and public incentive schemes targeting biodiversity enhancement within and beyond Europe, emphasising particularly on result-based approaches. The incentive schemes identified are presented and classified and results on agricultural context situation, biodiversity targets and indicators used for the monitoring of biodiversity results are derived. An overview on the sources is provided in ANNEX 1.

6.1 Identification and selection of existing private and public incentive schemes

The search for existing private and public incentive schemes concentrated on initiatives inside Europe, with expansion to key examples from outside Europe.

Major selection criteria for initiatives was the focus on biodiversity provision. Moreover, to the aim of being able to transfer results to the different EBAs' context situations, initiatives addressing agricultural systems represented in the SHOWCASE EBAs were included. There were no specific selection/exclusion criteria as regards implementation/payment types of incentives and/or scope of initiatives, therefore also very recent and small-scale initiatives are included.

To identify examples from inside Europe, an important source of information stems from the result-based payments network[10], providing a collection of evidence on existing schemes from 12 European member states plus UK. Moreover, the screening of initiatives particularly involved case studies from past and ongoing European research projects on improved incentives for public good provision, such as the H2020 projects CONSOLE[11], EFFECT[12] and CONTRACT2.0[13].

To identify examples from outside Europe, grey literature was screened via Google and the following search string: "*biodiversity scheme farmer [country]"*. Countries considered in the search included Canada, USA (with their top 10 agriculture-producing states[14], namely: California, Iowa, Nebraska, Texas, Kansas, Minnesota, Illinois, Wisconsin, Indiana and North Carolina) as well as Australia and New Zealand. These countries were selected to ensure the identification of initiatives that are, in the broadest sense, transferable and comparable to the EBA regions.

Also in countries of South America, Africa or Asia such as Brazil, Egypt or India, initiatives to conserve biodiversity could be identified showing a high variety of approaches. However, they were not included in this review due to their potentially different political, administrative and legal background as well as to language barriers. Generally, these initiatives are often strongly connected to the supply chain offering market incentives or market opportunities and/or are funded by development associations or local NGOs offering non-economic incentives such as agricultural training rather than economic incentives. In this sense, farmers are frequently promised to learn how to raise the productivity of their lands and, in consequence, reduce inequality, hunger and poverty. For a first impression please see – widely divergent – examples such as: Southern Cone Grasslands Alliance (southern South America), Reverte (Brazil), SPSB (Mexico), the Alto Huayabamba project (Peru), SoyChaco (Argentina), Trees4Tunisia

[10] https://www.rbpnetwork.eu/
[11] www.console-project.eu
[12] https://project-effect.eu/
[13] www.project-contracts20.eu
[14] https://www.ers.usda.gov/faqs/#Q1

(Tunisia), Farming with Alternative Pollinators (Morocco), the JeeraPhool initiative (India) or various projects of CEPF (global).

6.2 Overview of existing private and public incentive schemes

The list of screened existing private and public incentive schemes, up to now contains 49 initiatives in Europe, focussing on the improvement of biodiversity in different agricultural context situations. Furthermore, it considers 13 initiatives from outside Europe. The selection includes private as well as public initiatives, while private initiatives are mainly cases directly including the value chain. As regards implementation, the initiatives included are measure-/area-based and result-based payment approaches and represent collective as well as farm individual implementation (see Table 1). A specific measure-based implementation type, represented in a few cases, are land tenure approaches with biodiversity management requirements for the tenants (e.g. GL7).

The majority of initiatives focus on plot-level biodiversity management; however, some incentive examples address the farm level by targeting a specific farming system (e.g. dairy farming, DL1-DR4) or rewarding the sustainable management of the entire farm (e. g. awards as inN-EU7-8).

About half of the incentives schemes identified are result-based approaches, the other half implement measure-based approaches. However, it becomes obvious that in many cases design elements are combined. For example, result-based payment elements sometimes are included as top-ups to management-based approaches (e.g. AR1), or come along with payments for the installation of specific habitat structures (e.g. GL6; bat boxes, etc.), being the basis for the biodiversity results potentially achievable in this then “upgraded” habitat.

All incentives focus on biodiversity, this however in a broad range, and concern specific fauna species such as birds, insects/pollinators, mammals, as well as specific flora species. While most incentives found are implemented at the level of individual farms and implement sets of biodiversity measures at plot level, they mostly target a larger scale of biodiversity beyond the level of a single farm such as specific habitats like SPA and FFH areas. Some cases found implement measures in Natura2000/FFHSPA sites.

Table 1: Overview on data base

Class	Specific agr./ ecol. system	ID	Ctry	Title of initiative	Target	Plot level	Farm level	Organic frm	Market-based	Value chain	Result-based	Land tenure	Collective	Measure-based	Nat2000	FFH/SPA
Arable	Arable	AR1	FR	HAMSTER –Collective AECM to restore habitats of the European Hamster in Alsace (France)	Fauna Biodiversity (European Hamster)	x					x		x			
	Arable	AR2	DE	Harrier nest protection in arable fields (Weihenschutz) - Nordrhein-Westfalen	Avifauna Biodiversity (Harrier)	x					x			x		
	Arable	AR3	NL	Biodiversity monitor for ARABLE farming	Biodiversity	x	x			x	x					
	Arable	AR4	DE	Collaboration for sustainability between institutional landowners and tenant farmers	Biodiversity/habitats	x						x		x		
	Arable	AR5	IT	Carta del Mulino Barilla	Biodiversity (insects)	x				x				x		
	Arable	AR6	UK	RBPS for biodiversity on arable systems in England	Habitats (incl. habitats of Fauna-Flora-Habitat-Directive (FFH-D.)) Species (incl. species of FFH-D. and Birds Directive (BD)) Farmland birds, wading birds, pollinators, species rich meadows						x					x
	Arable	AR7	DE	Improving biodiversity and water quality while limiting the negative impacts on the economic viability of farms	Biodiversity and water quality	x								x		
	Arable	AR8	PT	Zonal programme of Castro Verde	Biodiversity/habitats: cereal steppe avifauna	x[15]								x	x	
Grassland	Grassland	GL1	ES	Biodiversity in Grasslands and improved hedges	a) Biodiversity in meadows, b) carbon fixation on slow-growing forests, and c) habitat connectivity via hedges.	x					x					
	Grassland	GL2	DE	Coordinated grassland bird protection (Gemeinschaftlicher Wiesenvogelschutz) - Schleswig-Holstein	Avifauna biodiversity: Lapwing (Vanellus vanellus), Black-tailed Godwit (Limosa limosa), Curlew (Numenius arquata), Oystercatcher (Haematopus ostralegus), and Redshank (Tringa tetanus)	x					x			x		
	Grassland	GL3	UK	RBPS for biodiversity on upland grassland systems in England	Habitats (incl. FFH-D.)) Species (incl. species of FFH-D. and Birds Directive (BD)) Farmland birds, wading birds, pollinators, species rich meadows	x					x					x
	Species-rich meadows /pastures	GL4	DE	Speciesrich grassland Rheinland-Pfalz (Artenreiches Grünland – Kennarten)	Species, habitats (incl. FFH-D.)) Protection of species-rich meadows and pastures	x					x			x		
	Species-rich meadows /pastures	GL5	DE	Speciesrich grassland (Artenreiches Dauergrünland) - Baden-Württemberg	Habitats, species (FFH, SPA)	x					x			x		x
	Grassland extensive	GL6	IRL	Burren Life Programme	Burren landscape and species	x					x			x		
	Grassland extensive	GL7	BG	Conservation and restoration of grasslands in Strandzha and Sakar mountains	Avifauna Biodiversity: Imperial Eagle, Booted eagle, Lesser spotted eagle, Long-legged buzzard (European Souslik as a main feed source)	x						x		x		

[15] not indicated unambiguously

Class	Specific agr./ ecol. system	ID	Ctry	Title of initiative	Target	Plot level	Farm level	Organic frm	Market-based	Value chain	Result-based	Land tenure	Collective	Measure-based	Nat2000	FFH/SPA
	Mosaic landscape/grassland habitats	GL8	ES	RBAPS in Navarra - MOSAIC PERENNIAL CROPS	Species (incl. FFH and BD), Landscape Elements	x					x					x
	Dry Grasslands	GL9	SVO	Conservation and Management of Dry Grasslands in Eastern Slovenia	Biodiversity/habitats (FFH-D)	x					x					x
	Humid extensive meadows	GL10	SVO	Testing the two-stage implementation of the operation for Humid extensive meadows: bird habitats	Habitats and Species (incl FFH and BD)	x					x			x	x	
	Organic farming (arable/grassland)	GL11	DE	Organic farming for biodiversity (Landwirtschaft für Artenvielfalt)	Biodiversity		x	x		x	x					
	HNV grasslands	GL13	RO	Results-based agri-environment payment scheme for Southern Transylvania	Flora Biodiversity: HNV grasslands	x					x					
	HNV grasslands	GL14	BG	Conservation of grasslands and meadows of high natural value through support for local livelihoods	Biodiv: endangered breeding birds, European ground squirrel and raptors (King Eagle and Long-legged buzzard)	x									x	
	Meadows and pastures and natural habitats in farmland (mainly dairy)	GL15	CH	Goal oriented promotion of biodiversity in the Canton of Zurich	Biodiversity	x					x					
	HNV meadows	GL16	AT	Result based nature conservation plan	Flora and fauna biodiversity	x					x					
	Sylvo-pastoral system	GL17	PT	Montado: Produzir e Conservar	Biodiversity, landscape elements, erosion control	x[16]					x			x	x	x
	Grassland	GL18	EE	Life connecting meadows	Biodiversity	x[17]								x[18]	x	x
	Grassland	GL19	DE	Results-based contracting for biodiversity conservation (Bavarian RDP) Ergebnisorientierte Honorierung im Grünland	Plant biodiversity: pre-defined plant species	x					x					
	Grassland	GL20	DE	Cooperative results-based bird conservation contracts (Flexible Grünlandbewirtschaftung mit Blick für Bodenbrüter - Gemeinschaftlicher Wiesenvogelschutz	Bird biodiversity	x					x					
	Grassland	GL21	BE	Result-based payments for botanical grassland development in Beverhoutsveld	Grassland biodiversity - Biodiversity/habitats (FFH-D)	x					x	x				x
Horti-culture	Citrus	HT1	ES	Zitrus project	Biodiversity		x			x				x		
	Viticulture	HT2	DE	Viticulture on steep slopes in the Moselle valley	Biodiversity (insects)	x					x		x	x		

[16] not indicated unambiguously
[17] not indicated unambiguously
[18] not indicated unambiguously

Class	Specific agr./ ecol. system	ID	Ctry	Title of initiative	Target	Plot level	Farm level	Organic frm	Market-based	Value chain	Result-based	Land tenure	Collective	Measure-based	Nat2000	FFH/SPA
Dairy	Dairy intensive	DR1	IRL	BRIDE -Biodiversity Regeneration in a Dairying Environment	Habitats (incl. habitats (FFH-D.), Species (incl. species of FFH-D. and Birds Directive (BD)), Landscape elements, Wetland, Others	x					x		x			
	Dairy intensive	DR2	NL	Biodiversity monitor for DAIRY farming	Biodiversity	x	x			x	x					
	Dairy intensive	DR3	IRL	CarberyGreener Dairy Farms™ CGDF	Carbon/Soil/Energy		x			x	x					
	Dairy intensive (?)	DR4	IRL	Protecting farmland pollinators	Biodiv: farmland pollinators		x				x					
Land-scape (Habitat) level	HNV farmland	LSC1	IRL	Hen Harrier Project	Biodiv Birds; Hen Harrier; Habitats and species FFH-D); Landscape elements; Wetland	x					x			x		x
	Landscape mgmt plans	LSC2	BE	Flemish nature management plan	Landscape, habitats	x								x	x	
	Landscape elements	LSC3	SE	Result and Value Based Agri-Environmental Payments to Landscape Elements and Forest edges	Landscape elements and edges	x										
	Landscape management plan	LSC4	NL	Collective approach delivering habitats AECM Scheme 2016-2020	Biodiversity, Water	x							x	x	x	
	Landscape management plan	LSC5	BE	3watErproject (LIFE+)	Species and habitats: Bittern (Botaurus stellaris);tree frog (Hylaarborea);'Oligotrophic waters'(3120),'Oligotrophic tomesotrophic s tandingwater' (3130),'Northern Atlantic wet heath swith Ericatetralix'(4010) and European dry heaths (4030).	x							x	x	x	
	Water quality mgmt	LSC6	PL	Program "Flowering meadows"	Biodiversity/water quality	x				x				x		
	Arrozua integrated rice production	LSC7	ES	Cooperative rice production in coastal wetlands in Southern Spain		x				x				x		
	Wet heaths/bogs	LSC8	ES	LIFE in common lands	Only habitats of FFH-D., 4020 Temperate Atlantic wet heaths with Erica ciliaris and Erica tetrali, 7110 Active raised bogs, 7130 Blanket bogs	x										x
	Biodiversity areas	LSC9	CH	Proof of Ecological Performance (PEP) and Biodiversity payments	Biodiversity						x			x		
	Natura 2000	LSC10	IT	Cooperation in Natura 2000 area	Biodiversity/Habitats	x							x		x	
Market-based	Various systems	MB1	DE	AgoraNatura - Online marketplace for certified nature conservation projects	Nature protection	x			x					x		
Value chain top-up	organic farming (arable)	ORG1	PL	Bio-Babalsky	Promotion of old wheat species			x		x				x		
	Organic farming grasslands	ORG2	BG	"The Wild Farm" organic farmers	Promotion of organic meat		x	x		x						
	Beekeeping	ORG 3	BG	Organic honey from Stara Planina mountain sites	Promotion of organic honey			x		x				x		

Class	Specific agr./ ecol. system	ID	Ctry	Title of initiative	Target	Plot level	Farm level	Organic frm	Market-based	Value chain	Result-based	Land tenure	Collective	Measure-based	Nat2000	FFH/SPA
	Organic farming	ORG 4	HU	On-Farm research network	Promotion of organic farming including use of various varieties and landraces	x[19]		x								
NON-EU	Various systems	N-EU1	CA	Alternative Land Use Services	Promotion of ecosystem services on agricultural lands through enhancement and restoration of habitats	x[20]							x	x	not applicable to non-EU countries	
	Various systems	N-EU2	CA	Plan d'accompagnement agroenvironnemental (PrimeVert)	Promotion of biodiversity	x[21]							x	x		
	Riparian areas	N-EU3	CA	Rural Water Quality Program (Dufferin County)	Restoration of aquatic and wildlife biodiversity	x								x		
	Various systems	N-EU4	US	Partners for Fish and Wildlife Program	Restoring and enhancing wildlife habitats	x[22]								x[23]		
	Various systems	N-EU5	US	Environmental Quality Incentives Program	Promoting general environmental benefits	x[24]								x		
	Various systems	N-EU6	US	Conservation Stewardship Program	Enhancing wildlife habitat	x								x		
	Various systems	N-EU7	US/IA	Iowa Farm Environmental Leader	Improving or protecting environment and natural resources		x									
	Arable	N-EU8	US	Sustainability Leadership Awards	Enhancing environment and agriculture		x			x						
	Various systems	N-EU9	US/TX	Farm and Ranch Lands Conservation Program	Protecting working land from fragmentation and development	x[25]								x[26]		
	Various systems	N-EU10	US/MN	Minnesota Conservation Reserve Enhancement Program	Improve environmentally sensitive land to e. g. provide habitat for wildlife, non-game species and pollinators	x								x		
	Various systems	N-EU11	AUS	Carbon + Biodiversity Plot	Enhancing biodiversity	x[27]								x		
	Various systems	N-EU12	AUS	Enhancing Remnant Vegetation Plot	Improve existing native vegetation	x[28]								x		
	Bush	N-EU13	AUS	BushTender	Protecting and improving native vegetation	x[29]					x					

[19] not indicated unambiguously
[20] not indicated unambiguously
[21] not indicated unambiguously
[22] not indicated unambiguously
[23] not indicated unambiguously
[24] not indicated unambiguously
[25] not indicated unambiguously
[26] not indicated unambiguously
[27] not indicated unambiguously
[28] not indicated unambiguously
[29] not indicated unambiguously

6.3 Analysis of existing private and public incentive schemes

At this stage of the project, the collection of initiatives (for sources of information see ANNEX 1) can give hints to the partners on the setting of management measures and indicators. Also, the exemplary initiatives can inform on design principles of biodiversity incentives, at this point in time particularly supporting the tasks T2.3, T2.4, T2.5, T2.6 and T2.9 in research- and survey design.

6.3.1 Classification of incentives

As regards the agricultural land-use system, most cases of biodiversity incentives focus on grassland habitats. Hereby often extensive grassland systems are addressed, such as HNV grassland, species rich meadows and pastures and/or humid extensive meadows. The biodiversity focus in grassland is mainly on species richness of the overall habitats (flora and fauna), but also on small mammals and nesting birds (GL1 – GL21). Another focus is arable land while the biodiversity focus is mainly on birds and insects/pollinators (AR1-AR8). For the agricultural system of horticulture, only 2 examples have been found (HT1-HT2). Some examples could be found focussing explicitly on dairy farming (DR1-DR6).

Another classification of incentives has been made by clustering incentive schemes targeting the level of agro-ecosystem/landscape/habitat focus, and therefore setting biodiversity targets and related measures beyond the level of single agricultural fields or farms, often by means of landscape management plans (LSC1 – LSC8). Nevertheless, also these schemes finally break down to plot level, as regards the implementation of measures as well as the incentive payments. Here, particularly the examples of collective schemes are of interest, where the holistic landscape approach is a precondition of funding (LSC4, LSC5).

A further class of incentives identified represents so called “top-up” value chain incentives (ORG1-ORG3), promoting organic production, while organic production is funded under the public agri-environmental schemes. Within the scope of SHOWCASE, such incentives can be of particular interest, as here win-win situations can develop and such exemplary solutions can potentially inform the development of business models and solutions.

Moreover, 1 market-based incentive mechanisms could be found, implementing an online market place for conservation projects (MB1), enabling nature conservation investors, which can be private individuals or companies, to get in contact with project providers for enhancing biodiversity and ecosystem services or conserving particularly valuable areas.

The last class of incentives includes – regardless of their accordance with other clustering aspects – those being implemented in countries outside the EU (N-EU1-N-EU13). These initiatives mainly do not target a specific agro-ecosystem/landscape/habitat but can be implemented in various production systems. N-EU13 represents initiatives issuing payments based on auctions which can be an interesting, cost-efficient option especially for result-based initiatives in the EBAs.

6.3.2 Incentive pathways towards biodiversity enhancement in agriculture

The existing examples of private and public incentive schemes reveal 3 major ways of achieving biodiversity objectives, namely (1) to extensify intensive agroecosystems and reinstall habitat infrastructure within the agroecosystem as basis for biodiversity (e.g. the cases of intensive arable or dairy farming), (2) to maintain the management of extensive agroecosystems faced by either abandonment and/or intensification (e.g. extensive grasslands, HNV grasslands, mosaic habitats, semi-natural habitats), and (3) to maintain and/or reinstall habitat infrastructure within the agroecosystem as basis for biodiversity.

6.3.3 Monitoring approaches

The existing examples explored show that the monitoring of management interventions (and their biodiversity effects) follows 2 main approaches, namely the monitoring of biodiversity indicators or the monitoring of measure implementation. The approach of monitoring clearly differentiates between result-based and measure-based schemes (see Table 2).

Table 2: Monitoring approaches

Monitoring of indicators	**Exemplary Cases (non-exhaustive)**
Monitoring presence of specific target (indicator) species	AR1, AR6, GL2, GL2, GL4, GL5, GL9, GL10; GL13, GL16, DR4, GL15, LSC4
Monitoring of state of site (habitat)/physical structures	AR6, GL1, GL2, GL6, GL8, GL9, GL16, DR1, DR4, GL15, HT2, LSC1, LSC4
Monitoring presence of feeding species (pollen, nectar)	AR6
Monitoring of KPIs	DR2, DR3
Monitoring of measures	**Exemplary Cases (non-exhaustive)**
Evidence of specific management practices	GL6, GL8, AR5, GL14, GL11, HT2, N-EU11, N-EU12
Installation of supporting infrastructure	GL7, DR1, GL6

For SHOWCASE, particularly the cases of indicator monitoring in result-based solutions are of high interest, as they can inform EBAs on how biodiversity monitoring can be directly combined with incentive schemes, potentially enhancing farmers' self-motivation and entrepreneurship for implementing interventions for improving biodiversity provision.

In many of the result-based incentives identified, monitoring directly focusses on the presence of the specific target (indicator) species. Often target species are presented as lists, of which a specific number has to be reached on the plots to activate payments (e.g. fauna species in the grassland systems GL1, GL5, GL13). In some cases, however, the presence of only one target species is the indicator resulting in payments (e.g. hamster burrows in AR1, presence of corncrakes in GL10), while here also different "degrees" of presence can be accompanied by different "pricing" (e.g. GL10; increasing payments for birds present, birds nesting habitats, presence of birds feeding and nesting).

Another frequent monitoring approach in result-based schemes is monitoring the state of the sites and/or the physical structures and vegetation available, as basis for the (future/potential) presence of target species. This approach takes into account the problem that the presence of specific species might only in parts be depending on the plots' management, but also on external factors, which can't be influenced by the farmers. Often this approach is implemented in form of habitat scores, where e.g. potential habitat points are assigned to specific plots and then evaluated in how far they reach the maximum potential scores (e.g. AR6, GL1, GL2, GL6, GL8, GL9, GL16, DR1, DR4, GL15, HT2, LSC1, LSC4). Very often, direct species targeting and habitat monitoring are combined in one incentive scheme.

In very specific cases of evaluating the suitability of habitats for specific target species, the presence of specific feeding species (e.g. AR6; number of species & cover of sown plants in plots of pollen & nectar resource (for pollinators)) rather than the target species itself is used as monitoring indicator.

Taking a similar direction as state of site monitoring, however being rather far from the presence of specific site infrastructure, is the evaluation of key performance indicators (KPIs) as demonstrated in AR3, DR2, DR3. Here, the approach is to identify agricultural management or farm level indicators which are easy to assess, in the best case using already existing agricultural farm data. Examples are the share of permanent grassland, information on soil nitrogen surplus, presence of nature conservation measures, etc. The examples of cases

showcasing such approaches are particularly interesting for the development of KPIs in SHOWCASE WP1, and the development of business solutions in WP2 task 2.9.

Taking into account the monitoring approaches and indicator systems represented particularly by the result-based cases identified so far (e.g. GL4, GL14), it is likely to be expected that such complex solutions might not fit in each context situation and in all European regions, as they demand high levels of skills from the partaking farmers, as well as high levels of knowledge and training capacities by the implementing and monitoring institutions. In this context, chapter 7 sheds a more detailed light on the suitability of result-based incentive approaches.

In contrast to monitoring biodiversity related results of interventions, in measure-based schemes the sound implementation of the intervention itself and the evidence of specific management practices is monitored. Examples are the monitoring of the implementation of specific crop rotations, minimum percentages of area allocated to flowers, specific variety selection, certified seeds, no use of neonicotinoids, no deep soil tillage, no use of glyphosate, maintaining plantings etc. (e.g. GL6, GL8, AR5, AR8, GL14, N-EU11, N-EU12). Normally, compensation payments are issued, mirroring the management costs/opportunity costs of the interventions. A specific form of incentives within the measure-based schemes identified are the cases of land tenure (e.g. GL7, GL14), where no payments are issued but area is rented to lower prices or at a zero lease to the tenants, if biodiversity management is carried out.

Within the measure-based schemes identified so far, also more flexible approaches are implemented, where farmers might choose from a list of potential conservation measures, and receive payments according to a minimum of credit points attributed to the single measures. Also here, the higher the credit point scores, the higher the payments issued (e.g. GL11, HT2).

Last but not least, payments for infrastructural measures as demonstrated in the cases Gl7, DR1, GL6 (e.g. implementing habitat infrastructure such as bat boxes, dry stone walls, etc.) represent one-shot incentives, directly targeting at the improvement of habitats.

7 Suitability of result-based pro-biodiversity approaches with regards to regulatory, policy, social and administrative contexts

In preparation of setting up biodiversity interventions in the EBAs and with regards to the focus of the preceding literature overview, the following chapter will cast a critical eye on the result-based approach, i.e. linking payments to farmers' biodiversity performance, and its suitability with regards to different international, national or regional contexts. This overview takes into consideration selected regulatory, policy, social and administrative issues.

As discussed by authors such as Wynne-Jones (2013), Burton and Paragahawewa (2011) or Colombo and Rocamora-Montiel (2018), certain aspects of the WTO regulations might limit the possibilities of designing result-based payments. Specifically, Green box measures – a selection of measures that is supposed not to lead to trade distortions and is therefore allowed without limits (WTO s. a.) – are limited to approaches which clearly define the corresponding production inputs/methods (WTO Agricultural, Annex II Z12 lit b) and only compensate income forgone or additional costs (WTO Agricultural, Annex II Z12 lit a). As a consequence, result-based approaches either have to be designed in a way that is suitable for these regulations or, otherwise, might lead to negative tax repercussions. Additionally, similar or even stricter regulations might be in place in the member states potentially hindering further implementation.

However, since result-based approaches are assumed to be more expensive for farmers, and also imply a remarkably high entrepreneurial risk (Burton and Schwarz 2013; Russi et al. 2016), compensation payments that only consider the costs of promising management practices potentially leading to the desired results might not be enough to cover the real costs – and thus be met with acceptance. E.g., result-based approaches might imply more time expenditure due to more complex management requirements (e. g.: Birge et al. 2017). Also, as farmers might be relatively unfamiliar with this approach, higher transaction costs are to be expected (Allen et al. 2014). This not only has to be harmonized with the WTO regulations. Before dealing with this issue, enough funding to cover at least the minimum compensation costs for farmers, but also running costs and evaluation costs must be guaranteed (Allen at al. 2014).

Furthermore, sticking to the fundamental principle of additionality might not be attainable in all contexts. Following this principle as discussed by Colombo and Rocamora-Montiel (2018) or Schwarz et al. (2008), payments are supposed to be restricted to environmental results that would not have been delivered without the corresponding pro-biodiversity measure. When focusing on the conservation, i.e. not the improvement of farm-level biodiversity, additionality is highly questionable as – without management prescriptions – farming may be continued as ever. This aspect, however, can also be brought up with regards to action-oriented measures merely based on conservation. Still, payments within these measures are based on specific farm management prescriptions which, as cutting farmers' management options, might be easier to legitimate.

With result-based approaches not only promoting, but also building on farmers' know-how, this know-how becomes another critical factor regarding the suitability of a result-based approach. Additional to the fact that even science is not yet completely aware of the interconnections between farm management practices and biodiversity, also farmers might lack relevant information fundamental for achieving results, i. e. the link between farming practices and biodiversity performance (Moxey and White 2014; Russi et al. 2016). E. g., as found by Wezel et al. (2018), farmers might even have difficulties to name promising measures. Since there

was a strong focus on maximising agricultural yields in the last decades and biodiversity conservation is a relatively new issue, specific training might therefore be required to successfully implement result-based approaches. Whereas agricultural training is well-established in some member states (such as Italy, the Netherlands, Germany or Denmark with high shares of basically trained farmers and Luxembourg, France, Czech Republic with high shares of fully trained farmers), farmers in some – especially the new – member states need to rely merely on practical experience (European Parliament 2017). Different educational backgrounds in different member states might in consequence lead to highly divergent experiences with result-based approaches.

Generally, low levels of experience with result-based approaches specifically might be a further factor influencing their acceptance (Allen et al. 2014) and in consequence their suitability in different member states. In addition, relevant experience and know-how as well as the provision of practical and reliable guidance from public authorities or extension services are further factors affecting the approach's suitability (Allen et al. 2014) – especially if they are not available to a sufficient extent or not accessible for all farmers in all member states. E. g., Laurent et al. (2006) found out that free extension service is decreasing constantly. This could hinder – especially small-scale – farmers to acquire relevant skills.

Besides this, farmers might lack trust in public institutions such as extension or administrative services leading to low acceptance (Allen et al. 2014). As result-based approaches show an increased complexity and risk for farmers in comparison with measure-oriented approaches (see above) – i. e. the risk of not receiving funding or being punished due to not attaining the goals through no fault of one's own – low trust in supporting institutions might weigh particularly heavy. This issue, in case the approach includes a collective component, also applies to potential third parties – a managing authority, coordination agent or intermediary – coordinating land managers' involvement and actions (Eichhorn et al. 2020). Especially in Eastern and/or post-socialist countries with potentially less positive assessment/trust in institutions (Lissowska 2013), the important role played by public institutions in extension services (Swanson and Davis 2014) and trust being generally a highly important factor of success (Allen et al. 2014; Prazan and Theesfeld 2014), suitability might, in consequence, be low. However, not only acceptability on the part of farmers is critical. Stakeholder attitudes – i. e. with regards to national- or regional-level decision-making and management authorities – is supposed to have a similar effect (Allen et al. 2014).

Whether the specific biodiversity objectives are compatible with result-based mechanisms – i. e. attaining the objectives mostly depends on farmers' practices and appropriate indicators can be found – is an additional, highly critical factor of the approach's suitability (Allen et al. 2014). This also comprises the existence of valid indicators which requires not only excellent know-how of environmental causalities (see above) but availability of high-quality supporting data (Allen et al. 2014). To support the reporting, administering and generally functioning of result-based approaches, the regional or national availability of practicable IT-systems monitoring the progress towards the pre-set objectives is another critical issue. Although being set up for existing agri-environmental schemes already, (financial) capacities for the adaption of these systems must be guaranteed in order not to restrict the functioning and flexibility of result-based approaches (Allen et al. 2014).

8 Key determinants for acceptance and uptake of incentives by farmers

The success of the described voluntary private and public incentive schemes to enhance biodiversity is a function of the implementation rate and the amount of land enrolled. As incentives are voluntary, the acceptance, uptake and implementation rate are dependent on the attractiveness of those incentives and farmers' perception of them. The intervention logic of the European Common Agricultural Policy (CAP) for incentives is that individual decisions and actions on a farm level accumulate to the provision of biodiversity on a landscape scale. Hence, while innovative approaches such as coordinated actions and cooperative approaches are applied, individual contracts with farmers prevail (Häfner and Piorr 2021; Lefebvre et al. 2015; 2019). Therefore, in the following we will assess the identified factors that influence the willingness of farmers to enhance biodiversity by accepting incentives and participating in schemes such as agri-environmental programmes targeted at biodiversity.

Hence, in this chapter we present a structured overview on farmers' willingness to promote biodiversity by implementing biodiversity measures of voluntary schemes. By conducting a systematic literature search in academic databases (such as Scopus and ISI Web of Science), we assess which factors influence farmers' perceptions of biodiversity, their willingness to apply biodiversity-friendly farming measures, and their participation in voluntary schemes targeted at biodiversity. The results are part of the conceptual fundament for WP2 and feed particularly task 2.2 on determinants for the implementation of regulatory frameworks and private and public incentives targeting biodiversity, task 2.3 on farmers' types, motives and biodiversity awareness, and task 2.4 on farmers' preferences for the mix of private and public incentives.

8.1 Methods

8.1.1 Systematic literature search

The literature search was initially executed through the databases Scopus and Web of Science Core Collection. Relevant terms were divided into three categories: subjects, determinants and targets.

subject: **farmer*, *peasant*, *rancher*, land AND owner*, (agricultur* OR farm*) AND (owner* OR producer* OR manager*)*

determinant: *percept*, perceive*, aware*, behav*, attitude*, adopt*, participat*, willing*, motiv*, accept*, uptake, …*

target: *(*environment* OR *ecolog*) AND (scheme* OR measure* OR program* OR polic* OR management* OR *practice* OR intervention* OR payment*), biodivers*, …*

All search terms were merged to a single search string (Box 1), in which the categories are connected with AND and the operators with OR. The terms within quotation marks are searched as a fixed expression and asterisks are placeholders for any combination of characters, including no character. Some terms were searched in consideration of their proximity to another term, which was conducted through the operators W/n or PRE/n in Scopus

and NEAR/n in Web of Science. W and NEAR ensures that the two terms are separated by no more than n words in between, whereas in case of PRE the first term has to be prior to the second term and within a distance of n words maximum.

In order to get a comprehensive result while not being flooded with inappropriate information and secondary literature, the terms were separately searched in titles, abstracts and keywords. The language of documents was limited to English and German. Due to the fact that agricultural policies, societal norms and socio-economic conditions are constantly changing, the temporal scale is restricted to the period 2000-2021. All records received from this search were downloaded for further processing.

Additionally, snowball sampling method is applied to complement relevant studies.

Box 1: Exemplary literature search in Scopus

Search string

TITLE((*farm* OR *peasant* OR *rancher* OR (land AND owner*) OR ((agricultur* OR farm*) AND (owner* OR producer* OR manager*))) AND (percept* OR perceive* OR aware* OR behav* OR knowledge OR understand* OR attitude* OR feeling* OR identit* OR imag* OR conscious* OR concept* OR opinion* OR notion* OR belie* OR position* OR sensibilit* OR recogni* OR thought* OR view* OR judg* OR mindset* OR adopt* OR participat* OR engage* OR cooperat* OR willing* OR *like* OR motiv* OR intent* OR agree* OR accept* OR uptake OR "take* up" OR choose OR chose* OR choice OR decision* OR decide* OR prefer* OR favo* OR select* OR compromi* OR adapt* OR refus* OR resist*) AND (((*environment* OR *ecolog*) AND (scheme* OR measure* OR program* OR polic* OR management* OR *practice* OR intervention* OR payment*)) OR biodivers* OR ((conservation OR ecol* OR bio* OR organic) AND (measure* OR agriculture* OR farm* OR cultivat*)) OR "ecological focus area*" OR (*flower* AND (strip* OR meadow*)) OR hedgerow* OR "field margin*" OR non-harvest* OR "dry stone wall*" OR (landscape AND element*) OR (field AND tree*) OR ((reduc* OR low* OR less OR no OR restrict*) AND (pesticide* OR herbicide* OR fungicide* OR fertilizer* OR *chemic*)) OR no-till* OR "no till*" OR "conservat* till*" OR "direct sow*" OR "cover crop*" OR "crop diversification" OR fallow OR ((buffer OR grass) AND (zone* OR strip*)) OR "crop rotation*" OR intercrop* OR agroforest* OR silvopastur* OR extensiv* OR ((permanent OR herb* OR *flower*) AND (grass* OR pastur*)) OR ((less OR reduc* OR low*) AND (stock* OR dens*)) OR ((delay* OR late*) AND mow*) OR (wetland* AND (creat* OR rewet*)) OR "water log*" OR (reduc* AND field* AND size*) OR (small* AND field*) OR ((nest* OR breed* OR insect* OR pollinator* OR bee* OR bat* OR bird* OR skylark* OR *beetle* OR animal* OR wildlife) AND (box* OR hotel* OR shelter* OR refuge* OR plot* OR window* OR bank* OR habitat* OR protect* OR conserv*))) AND NOT aquacultur* AND NOT fish*) OR

ABS((*farmer* OR *peasant* OR *rancher*) W/8 (percept* OR perceive* OR aware* OR behav* OR feeling* OR conscious* OR belie* OR judg* OR attitude* OR prefer* OR favo* OR motiv* OR ((why OR reason* OR willing* OR like* OR decision* OR decide* OR choose* OR chose* OR choice* OR intend* OR intention OR rational* OR position* OR refuse* OR dislike* OR deny) W/8 (adopt* OR participat* OR engage* OR cooperat* OR transform* OR agree* OR accept* OR uptake OR "take* up" OR adapt* OR apply))) AND (((*environment* OR *ecolog*) PRE/3 (scheme* OR measure* OR program* OR *practice* OR intervention* OR payment*)) OR biodivers* OR ((conservation OR ecol* OR bio* OR organic OR extensive*) PRE/3 (measure* OR agriculture* OR farm* OR cultivat*)) OR "ecological focus area*" OR ((flower* OR wildflower*) W/2 (strip* OR meadow*)) OR hedgerow* OR ((field) W/3 (margin*)) OR non-harvest* OR "dry stone wall*" OR "landscape element*" OR ((field) W/3 (tree*)) OR ((reduc* OR low* OR less OR no OR restrict*) W/6 (pesticide* OR herbicide* OR fungicide* OR fertilizer* OR *chemic*)) OR no-till* OR "no till*" OR "conservat* till*" OR ((direct*) W/2 (sow*)) OR "cover crop*" OR "crop diversification" OR fallow OR ((buffer OR grass) PRE/0 (zone* OR strip*)) OR "crop rotation*" OR intercrop* OR agroforest* OR silvopastur* OR ((permanent OR herb* OR flower* OR wildflower*) W/8 (grass* OR pastur*)) OR ((less OR reduc* OR low*) W/3 (stock* OR dens*)) OR ((delay* OR late*) W/2 (mow*)) OR ((wetland*) W/3 (creat* OR rewet*)) OR "water log*" OR ((reduc*) W/3 (field*) W/3 (size*)) OR ((small*) W/3 (field*)) OR ((nest* OR breed* OR insect* OR pollinator* OR bee* OR bat* OR bird* OR skylark* OR *beetle* OR animal* OR wildlife) W/2 (box* OR hotel* OR shelter* OR refuge* OR plot* OR window* OR bank* OR habitat* OR protect* OR conserv*))) AND NOT aquacultur* AND NOT fish*) OR

KEY((*farmer* OR *peasant* OR *rancher*) AND (perception* OR awareness OR behav* OR attitude* OR belief* OR willingness OR motivation OR acceptance) AND (((*environment* OR *ecolog*) PRE/0 (scheme* OR measure* OR program* OR *practice* OR intervention* OR payment*)) OR biodivers* OR ((conservation OR ecol* OR bio* OR organic) PRE/0 (measure* OR agriculture* OR farm* OR cultivat*)) OR "ecological focus area*" OR ((*flower*) PRE/0 (strip* OR meadow*)) OR hedgerow* OR ((field) W PRE/0 (margin*)) OR non-harvest* OR "dry stone wall*" OR "landscape element*" OR ((field) PRE/0 (tree*)) OR ((reduc* OR low* OR less OR no OR restrict*) W/0 (pesticide* OR herbicide* OR fungicide* OR fertilizer* OR *chemic*)) OR no-till* OR "no till*" OR "conservat* till*" OR "direct sow*" OR "cover crop*" OR "crop diversification" OR fallow OR ((buffer OR grass) PRE/0 (zone* OR strip*)) OR "crop rotation*" OR intercrop* OR agroforest* OR silvopastur* OR extensive* OR ((permanent OR herb* OR *flower*) PRE/0 (grass* OR pastur*)) OR ((delay* OR late*) PRE/0 (mow*)) OR "wetland creation" OR rewet* OR "water log*" OR (reduc* AND field* AND size*) OR ((small*) W/0 (field*)) OR ((nest* OR breed* OR insect* OR pollinator* OR bee* OR bat* OR bird* OR skylark* OR *beetle* OR animal* OR wildlife) PRE/0 (box* OR hotel* OR shelter* OR refuge* OR plot* OR window* OR bank* OR habitat* OR protect* OR conserv*))) AND NOT aquacultur* AND NOT fish*) AND PUBYEAR > 1999 AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE, "German"))

8.1.2 Literature selection

Subsequent to the exclusion of duplicates, the titles of the results were checked for suitability in order to sort out unsuitable records. This was conducted through CADIMA (www.cadima.info), which is a software for scanning literature systematically. Whenever the content could not be derived from the title, abstracts were scanned and, if necessary, also the entire texts. In the case of indecisiveness, the article remained in the body of selected results. In conclusion, we excluded all literature for the qualitative review that was outside the scope, e.g. if conducted outside of Europe, not targeted at biodiversity or assessing public perception instead of farmers' viewpoints.

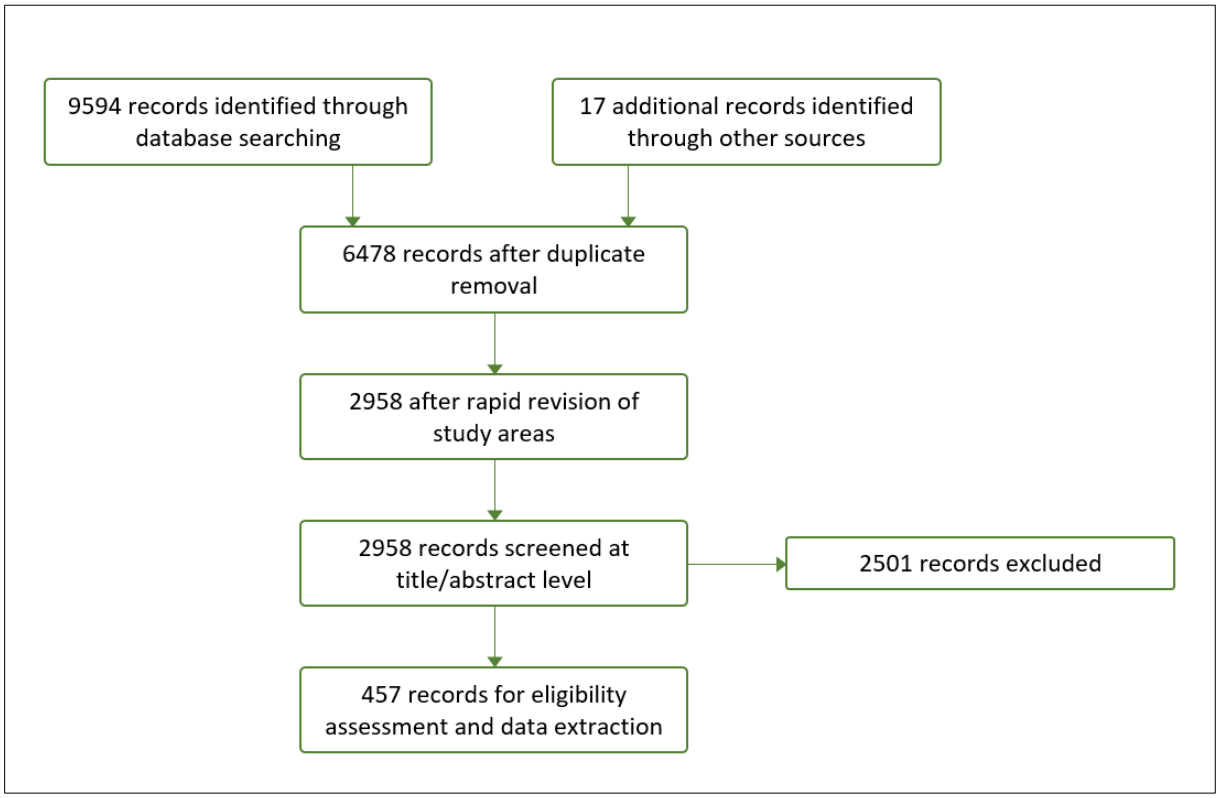


Figure 5. Process followed for the selection of scientific studies.

8.1.3 Data analysis

The remaining 457 studies and reviews were scanned, coded, categorized and sorted regarding to the relevance for our research question. Only studies that lack of scientific quality criteria were excluded at this stage. The further data analysis compromises two major parts. The first part covers a quantitative description of the literature body considering quantity, year of publication, location of case studies, location of affiliations and methodologies. During the second part, a qualitative extraction of research findings was executed with the aim to represent a range of factors that influence the farmers' willingness to adopt biodiversity-friendly farming. This process started with a selection of quantitative and qualitative studies that are most relevant for the research question. The results were then clustered and concentrated. Due to the heterogeneity of methods and results, the extracted factors are not weighted but rather categorized according to their direction of influence (promoting/inhibiting).

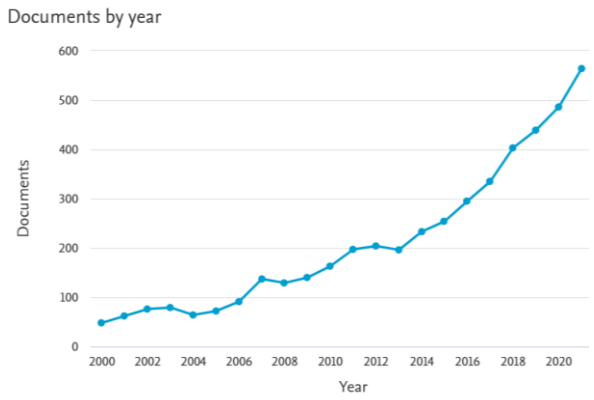
8.2 Results

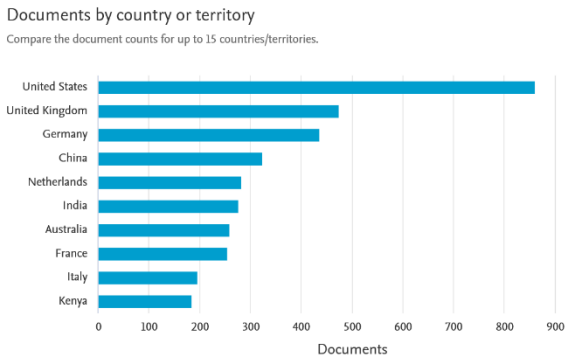
We find a constant increase of publications regarding farmers' perceptions of biodiversity, their motives, characteristics and willingness to promote biodiversity (see box 2 for the results of Scopus search). A majority of research is conducted in the global north of the world, and even single institutions, such as Wageningen University stand out with more than 200 publications on the topic.

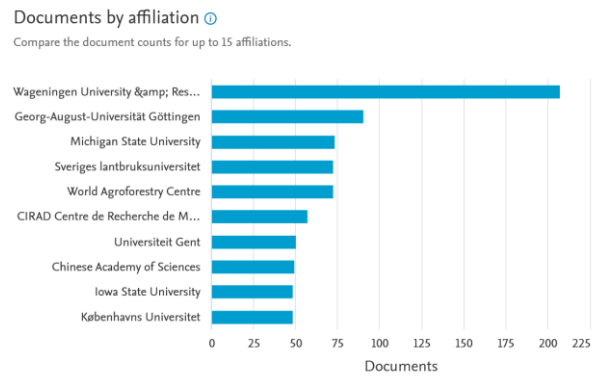
Box 2: Exemplary results of the literature search in Scopus

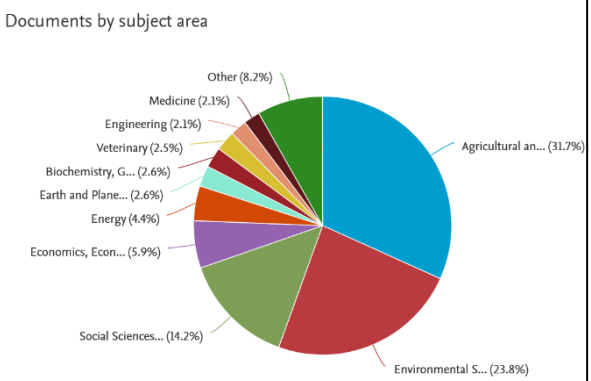
Results

4,668 document results









Regarding the findings of the conducted research we focus on an extraction based on some selected references. We identified many *factors influencing European farmers' willingness to enhance biodiversity by participating in biodiversity-friendly farming measures*. They can be structured along three levels/scales, that we describe more in detail:

1. Society, community and landscape
2. Farm scale
3. Farmers' intrinsic factors

8.2.1 Society, community and landscape

The first level/scale that we consider encompasses policies, society and culture, economics and markets, information provided, and the landscape with its natural environment and biogeophysical circumstances. These factors externally influence the decision making of a farmer to implement biodiversity management.

Regarding the influence of policies on farmers' decision making the **design of the policies** plays a major role. Policies can be obligatory/compulsory, such as regulations, directives and laws (e.g. see chapters 3 and 5.1 of this deliverable), or they are voluntary like agri-environmental and climate measures (AECM) of the European Common Agricultural Policy (CAP) or other private payments for ecosystem services (PES). While the prescriptions of the compulsory policies are mandatory, the voluntary schemes have to be attractive to farmers. Therefore, the design of these voluntary schemes is of special importance to attract farmers to participate in them. Already the **voluntariness** of policies itself is found to be an enabling factor (Brown et al. 2019; Falconer 2000; Siebert et al. 2006), and design features of the voluntary contracts can have an enabling or inhibiting influence. However, regarding these design features "it is important to view support for practices oriented towards biodiversity protection not in a static sense – as a situation determined by one or several influencing factors – but rather as a process marked by interaction." (Siebert et al. 2006). In this line are the following considerations.

Contracts are more accepted, if they are **well adjusted to the local setting**, situation and conditions, for example because they are rooted in **bottom-up approaches** (Siebert et al. 2006), or farmers could **participate the design process** (de Krom 2017), and their **knowledge about production and nature is considered** (Ahnström et al. 2008). This consideration of farmers' knowledge and viewpoints in the design process of policies highly enhances the acceptance of programs, because it allows for adaptation to farmers' realities (Burton et al. 2008) and a better fit to their existing farming practices (Brown et al. 2019; Fienitz 2018; Fleury et al. 2015; Guillem and Barnes 2013; Keenleyside et al. 2011; van Herzele et al. 2013). This enhanced fit of a policy scheme in turn reduces the additional (perceived) effort of implementation and the respective transaction costs. **Low transaction costs** proved to be very beneficial for the acceptance of contracts for biodiversity (Brown et al. 2019; Falconer 2000; Siebert et al. 2006; Vanslembrouck et al. 2002). However, while these more participative approaches can reduce transaction costs of implementing biodiversity management schemes, due to better fit to the local conditions, transaction costs are usually enhanced at first, because exchanging information, learning, communication and interaction with other actors demands time and effort (Häfner and Piorr 2021). The trade-off between the taken efforts and potential higher success rate of more adjusted and participative policy design approaches should be well considered. Up-to-date there is no full assessment of these trade-offs.

Another option to allow policy designs to be better adjusted to the local condition is to give farmers more freedom to decide by themselves what to implement instead of giving precise management descriptions/prescriptions (such as a set date for mowing etc.). Such a **flexibilisation** of programmes is found to highly enhance acceptance of biodiversity schemes and can range from a flexible contract cancellation option, to flexible width of field margins, to own choice of seed varieties (Burton et al. 2008; Christensen et al. 2011; Espinosa-Goded et

al. 2010; Keenleyside et al. 2011; Mante and Gerowitt 2009; Ruto and Garrod 2009). However, when flexible schemes are implemented in such a way that farmers decide themselves how to reach an environmental target and are free from prescribed management plans, results have to be monitored. The approach of **result-based schemes** that are goal-oriented differs from measure-based schemes with precisely described management prescriptions (compare also chapter 6 of this Deliverable). Here the better fit to the local conditions of result-based schemes, due to the possibility to allow for farmers' preferences and the already existing farming practices, can trade-off with efforts to monitor the results.

Factors that in general reduce the acceptance of policies targeted at biodiversity are **high transaction costs** (Brown et al. 2019; Falconer 2000; Mante and Gerowitt 2009; Siebert et al. 2006; Vanslembrouck et al. 2002), **too many restrictions** (Burton et al. 2008; Christensen et al. 2011; Espinosa-Goded et al. 2010; Mante and Gerowitt 2009), and especially **great efforts**, e.g. in the registration process and **bureaucracy** (Fienitz 2018; Franks et al. 2016; Mante and Gerowitt 2009; Ruto and Garrod 2009; Schroeder et al. 2013; van Herzele et al. 2013).

The setting the policies are embedded in, i.e. **society and culture,** play another crucial role. **Social norms,** for example, can put pressure on farmers(Kuhfuss et al. 2016; Mills et al. 2017; van Dijk et al. 2016). **Societal judgements** and **demands from society**, e.g. for food to be produced to a higher environmental standard (Cusworth 2020), and the public opinion (van Herzele et al. 2013) further influence the willingness of farmers to implement biodiversity-friendly farming measures. Through this implementation they can show a more positive image of farmers to locals and the public (Busse et al. 2021). However, these biodiversity-friendly actions can be in contrast to or align with **traditions** and **habits of former generations** leading to conflicts or support of the practices (Fleury et al. 2015; Mills et al. 2017).

Farmers are part of **social networks** and often of **farmer unions**. This influences the perception and acceptability of biodiversity measures (Barreiro-Hurlé et al. 2010; de Krom 2017; Ducos et al. 2009; Guillem and Barnes 2013; Mills et al. 2017; Oreszczyn et al. 2010; van Dijk et al. 2016). Environmental Cooperatives, for instance, can positively influence farmers' willingness by means of facilitation and also 'positive' group pressure (van Dijk et al. 2016). Additionally, participation in schemes is found to be more successful, when farmers succeed in building up bridging social capital by receiving other regional stakeholders' appreciation for their agri-environmental work (de Krom 2017). In contrast, **peer pressure** was also found to incite farmers "to maintain their AES land tidy" and "consider it their responsibility to forestall negative impacts of their AES land on the agricultural productivity of neighbouring farms" (de Krom 2017, p. 356). **Neighbouring farmers** in general have significant influence through neighbours' experiences of successful negotiation processes, judgement of neighbours, and their shared 'common sense agriculture' (Burton et al. 2008; Defrancesco et al. 2008; Fienitz 2018; Siebert et al. 2006). Additionally, previous experience of neighbours with agri-environmental measures forms the perception (Damianos and Giannakopoulos 2002; Vanslembrouck et al. 2002); and a learning from each other takes place by receiving information on other farmers pro-environmental practices (Kuhfuss et al. 2016). A factor that has a negative impact on the acceptance of biodiversity measures is **isolation** from networks and other farmers (Capitanio et al. 2011; Mills et al. 2017).

One of the major factors for farmers to participate in schemes targeted to enhance biodiversity are **economic considerations**. The level of **financial compensation** and expected **profits** strongly influences the business decision. The higher the payment, the higher the willingness to participate (Busse et al. 2021; Christensen et al. 2011; de Krom 2017; Defrancesco et al. 2008; Falconer 2000; Mante and Gerowitt 2009; Stobbelaar et al. 2009; van Herzele et al. 2013). However, besides the pure compensation of income forgone the payments can provide or contribute to profit maximisation, long-term farm viability, and risk minimisation (Ahnström et al. 2008; Brown et al. 2019; Siebert et al. 2006) and therefore appear attractive. Participation can e.g. **improve the farm business** by reducing the inputs (of fuel, fertilizer and pesticides), and improving quality and/or appealing to niche markets (Wynne-Jones 2013). This can create opportunities to produce higher quality products (Giomi et al. 2018) and therefore generate higher income (profit maximisation).

However, **markets** strongly influence the opportunity to produce in a biodiversity-friendly way. On the one hand there is market pressure to produce at usual market terms, and keep up with international market competition (Ahnström et al. 2008; Schoonhoven and Runhaar 2018). On the other hand, difficult access to markets and lack of adequate value chains for alternative products (e.g., alfalfa, sunflower, faba beans, hemp) hamper biodiversity-friendly production (Busse et al. 2021). And also higher **opportunity costs** of alternative, economically more attractive uses for the land exist, which reduces the acceptance of schemes (Keenleyside et al. 2011). Some levels of compensation payment are simply not competitive; e.g. if one thinks of horticultural systems with very high profits per hectare.

Other factors influencing the uptake of biodiversity-friendly measures are **information** (access, sources, and lack of information) (Falconer 2000; Oreszczyn et al. 2010; Sutherland et al. 2013), **uncertainty** with considerations of risks (Brown et al. 2019; Wynne-Jones 2013) and also the **natural environment** at landscape scale, where ecological reasons (Kuhfuss et al. 2016; Siebert et al. 2006) or compatibility with the local conditions in terms of climate and soil characteristics (Sattler and Nagel 2010) hinder or benefit the uptake of schemes.

8.2.2 Farm scale

On a farm level, relevant factors are clustered and described as **farm characteristics**. Although the farmer is the central part of his or her farm, personal factors are classified as intrinsic factors (see below). The **farm type** is of particular importance, e.g. are schemes more profitable for grassland and livestock farming than for arable land (Barreiro-Hurlé et al. 2010; Borsotto et al. 2008; Capitanio et al. 2011; Defrancesco et al. 2008; Ducos et al. 2009; Peerlings and Polman 2009; Polman and Slangen 2008; Siebert et al. 2006; Zimmermann and Britz 2016). Farms with permanent crops (Capitanio et al. 2011; Defrancesco et al. 2008; Zimmermann and Britz 2016) or horticulture/vegetable production (Zimmermann and Britz 2016) are rather rejecting participation than other farm types.

Regarding the **farm size** there are diverse effects found. While some studies find larger farms to be significantly more willing to implement biodiversity-friendly farming measures (Ducos et al. 2009; Peerlings and Polman 2009; Schroeder et al. 2013; Siebert et al. 2006; Vanslembrouck et al. 2002; Zimmermann and Britz 2016), and other find only a tendency towards larger farms (Lastra-Bravo et al. 2015; Murphy et al. 2014), some studies report opposite effects with smaller farms being more likely to participate in schemes (Brown et al.

2019; Capitanio et al. 2011; Sardaro et al. 2016). This heterogeneity in results can be explained by the lack of consistency in ways in which farms are defined as ‘‘large’’ or ‘‘small’’, which is in itself partly due to the discrepancy in average farm size across EU member states (Lastra-Bravo et al. 2015). Also, the level of fixed costs may explain why the smallest farms tend to be least likely to participate in such schemes (Ducos et al. 2009); also their effort to register in schemes is comparatively high.

For the implementation of biodiversity measures, **field characteristics** and local conditions play an important role. Schemes are more often implemented in areas with **low profitability**, e.g. due to **low soil quality** (Brown et al. 2019; Hynes and Garvey 2009), in mountainous areas (Borsotto et al. 2008; Capitanio et al. 2011), less favoured area locations (Zimmermann and Britz 2016), or **unproductive land** (Keenleyside et al. 2011). Also implementing measures is seen as a good alternative for marginal or too fragmented land and other sites of bad physical conditions, such as areas next to woodlots (shadow), wet soils (along streams) or damaged locations (along paths) (van Herzele et al. 2013). The underlying reasons are usually low opportunity costs of those unfavourable locations. In contrast, if farms are managed with a high **degree of intensification** (definitions of ‘intensive’ differ: many inputs, very productive in terms of food production per area, high stocking density of livestock, etc.), farmers are found to be less willing to participate in schemes and implement a biodiversity-friendly management (Brown et al. 2019; Ducos et al. 2009; Hynes and Garvey 2009; Murphy et al. 2014; Sardaro et al. 2016; Siebert et al. 2006; Zimmermann and Britz 2016)

Moreover, **land tenure** plays a role. Farmers who rent the land that they manage are found to be less likely to engage in schemes targeted at biodiversity (Ahnström et al. 2008; Brown et al. 2019; Siebert et al. 2006). One explanation is that they expect problems with their landowner (Mante and Gerowitt 2009).

8.2.3 Farmers’ intrinsic factors

Farmers’ **individual characteristics** are strongly connected to the willingness to implement biodiversity-friendly management and participate in agri-environmental schemes. The influence of **age** of a farmer is widely studied and almost all literature we consider here found that younger farmers are more willing to participate than older farmers (Ahnström et al. 2008; Brown et al. 2019; Calatrava Leyva et al. 2007; Capitanio et al. 2011; Damianos and Giannakopoulos 2002; Ducos et al. 2009; Hynes and Garvey 2009; Mathijs 2003; Murphy et al. 2014; Peerlings and Polman 2009; Sardaro et al. 2016; Schroeder et al. 2013; Zimmermann and Britz 2016). Mettepenningen et al. 2013 even found that up until the age of 42 the probability of adopting the scheme increased with age, but after this peak the probability decreased, with young farmers being often tight on resources and older farmers more reluctant to engage in new activities on the farm.

A similar strong explanatory power is found for **education**. The participation increases with higher education (Ahnström et al. 2008; Barreiro-Hurlé et al. 2010; Ducos et al. 2009; Mathijs 2003; Vanslembrouck et al. 2002), which is valid for general and agricultural education (Damianos and Giannakopoulos 2002). The reason for this lies in a better understanding of the requirements and implications of the measures (Barreiro-Hurlé et al. 2010). Also (practical)

skills and **knowledge** on the environmental potentials of a farm are related to higher willingness to implement biodiversity management due to higher capacities of the farmer and farm business in terms of technical knowledge and understanding, administrative ability and cash flow (Keenleyside et al. 2011). This might also explain why previous **experience** with agri-environmental schemes usually leads to higher participation rates also in other biodiversity schemes (Brown et al. 2019; Cusworth 2020; Defrancesco et al. 2008; Schroeder et al. 2013). The farmers developed skills through participation in similar schemes (Mante and Gerowitt 2009; Siebert et al. 2006) and are more familiar with conservation programmes (Lastra-Bravo et al. 2015; Wossink and Wenum 2003). This can build **trust**, and the higher the trust, e.g. in authorities (Ducos et al. 2009; Peerlings and Polman 2009), the higher the willingness to implement biodiversity-friendly farming measures.

For understanding farmers' decision making, it is further crucial to consider their overall **farming philosophy** (Mills et al. 2017) as part of the religious or holistic life vision (Stobbelaar et al. 2009), which is dependent on how a farmer interprets, accepts or rejects social norms (Mills et al. 2017). The adoption of productivist values and the paradigm to need to 'feed the world', for instance, prevents an uptake of biodiversity measures (Mills et al. 2017). In contrast, many farmers perceive the implementation of environmental measures as a legitimization of their farming activities or a 'licence to produce' (Sattler and Nagel 2010; Siebert et al. 2006). Farmers who identify themselves as 'custodians' maintaining the land for future generations or farmers who regard the conservation of biodiversity and the natural environment as a moral obligation towards the family and society do also have a greater intrinsic motivation to care about the environment and connected ecosystem services (Ahnström et al. 2008; Fleury et al. 2015; Schoonhoven and Runhaar 2018). As indicated here, the **farmers' self-identity** (Burton et al. 2008; Lokhorst et al. 2011; van Dijk et al. 2015) and the conception of what characterizes a 'good farmer' (de Krom 2017; Mills et al. 2017; Sutherland et al. 2012) are central in explaining their behaviour. For instance, if being a 'good farmer' is solely determined by agricultural production, it will be rather unlikely that the farmer participates in agri-environmental programmes (Mills et al. 2017; Wynne-Jones 2013). However, doing the job well increasingly implies to additionally implement a proper environmental management and to not cause unnecessary or severe environmental damages, which increases the willingness to uptake conservation practice instead (Cusworth 2020, p. 169).

Finally, willingness is the outcome of attitude under various social, cultural, political, economic and environmental influences, and intrinsic factors directly affect the farmer's behaviour and his or her willingness to apply biodiversity-friendly farming measures. However, if a farmer lacks the **ability** of implementing such measures, the behavioural outcome will differ from the intrinsic motivation.

9 Outlook on further use of Deliverable 2.1 for scientific analyses

Deliverable D2.1 provides a common knowledge basis on regulation and incentive schemes for the whole project. For WP1, the deliverable shall provide exemplary existing case studies which can be used as basis of intervention co-design, as well as for the development and the use of feasible indicators, particularly suited for result-based approaches. Moreover, the Deliverable will be particularly used as a basis for elaborating the further elements of WP2. Here, the results of deliverable D2.1 have will directly support WP2 in providing a basis for the development of the surveys of tasks T2.2, T2.3 and T2.4. For task T2.2, at the time of the finalisation of this report, contents have already been well integrated into the qualitative surveys held in each EBA since September 2021. For tasks T2.3 and T2.4, the review will deliver valuable inputs for preparing the survey on farmers' attitude, and for the design of optimal incentive schemes and incentive mixes for the choice models. For T2.5, the review will deliver the basis for in-depth analysis of incentive implementation. For Task 2.9, the review of existing case is useable on the one hand to screen best practice examples for business solutions, and on the other hand to inform on feasible KPIs developed in existing initiatives. Last but not least, the review will, together with the results of the single WP2 tasks, be used as one basis for the project's development of policy recommendations on the design, combination and implementation of regulatory instruments as well as private and public incentives in Task T4.7.

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ANNEX 1

Title of initiative	CTR	Source
HAMSTER –Collective AECM to restore habitats of the European Hamster in Alsace (France)	FR	https://drive.google.com/file/d/1hcDr9_5j5f8ofssP4gwjBiGypcfM_oyv/view
Harrier nest protection in arable fields (Weihenschutz) - Nordrhein-Westfalen	DE	https://www.rbpnetwork.eu/country-infos/germany/harrier-nest-protection-in-arable-fields-weihenschutz-nordrhein-westfalen-49/
Biodiversity monitor for ARABLE farming	NL	https://drive.google.com/file/d/1WR-KmUD187hA_wzjCqBXlyP0RGvJGPeD/view
Collaboration for sustainability between institutional landowners and tenant farmers	DE	https://drive.google.com/file/d/1zY-d35OT3wrWLx7RbTqEvVGgdGvGvoVa/view
Carta del Mulino Barilla	IT	https://drive.google.com/file/d/1vaEtL03-Rj_FXdDvnWDi2p9bOVTr8mcJ/view
RBPS for biodiversity on arable systems in England	UK	https://www.rbpnetwork.eu/country-infos/united-kingdom/rbps-for-biodiversity-on-arable-and-upland-grassland-systems-in-england-29/
Improving biodiversity and water quality while limiting the negative impacts on the economic viability of farms	DE	https://uniseco-project.eu/case-study/germany
Zonal programme of Castro Verde	PT	http://www.hnvlink.eu/download/Portugal_LocallyadaptedAgri-environmentalmeasure.pdf
Biodiversity in Grasslands and improved hedges	ES	https://www.rbpnetwork.eu/country-infos/spain/biodiversity-in-grasslands-and-improved-hedges-34/
Coordinated grassland bird protection (Gemeinschaftlicher Wiesenvogelschutz) - Schleswig-Holstein	DE	https://www.rbpnetwork.eu/country-infos/germany/coordinated-grassland-bird-protection-gemeinschaftlicher-wiesenvogelschutz-schleswig-holstein-48/; https://ec.europa.eu/environment/nature/rbaps/fiche/grassland-bird-protection-payments-germany-schlesw_en.htm
RBPS for biodiversity on upland grassland systems in England	UK	https://www.rbpnetwork.eu/country-infos/united-kingdom/rbps-for-biodiversity-on-arable-and-upland-grassland-systems-in-england-29/
Speciesrich grassland Rheinland-Pfalz (Artenreiches Grünland – Kennarten)	DE	https://ec.europa.eu/environment/nature/rbaps/fiche/species-rich-grassland-artenreiches-grunland-kenna_en.htm
Speciesrich grassland (Artenreiches Dauergrünland) - Baden-Württemberg	DE	https://www.rbpnetwork.eu/country-infos/germany/species-rich-grassland-artenreiches-dauergruenland-baden-wuerttemberg-47/
Burren Life Programme		http://burrenprogramme.com/
Conservation and restoration of grasslands in Strandzha and Sakar mountains	BG	https://drive.google.com/file/d/1U6BlKGyLHICYLWD1Xh2dfMP_cqi44ncy/view
RBAPS in Navarra - MOSAIC PERENNIAL CROPS		https://rbaps.eu/pilot-areas/navarra-spain/mosaic-farmed-habitats-navarra/
Conservation and Management of Dry Grasslands in Eastern Slovenia	SVO	https://www.rbpnetwork.eu/country-infos/slovenia/conservation-and-management-of-dry-grasslands-in-eastern-slovenia-life14-nat-si-000005-6/
Testing the two-stage implementation of the operation for Humid extensive meadows: bird habitats	SVO	https://www.rbpnetwork.eu/country-infos/slovenia/testing-the-two-stage-implementation-of-the-operation-for-humid-extensive-meadows-bird-habitats-53/
Organic farming for biodiversity (Landwirtschaft für Artenvielfalt)	DE	https://drive.google.com/file/d/1iPv1MiLiMDShrqXkFltSrOb1CAvDFUhk/view
Results-based contracting for biodiversity conservation (Ergebnisorientierte Honorierung im Grünland)	DE	https://www.lfl.bayern.de/iab/kulturlandschaft/024907/index.php https://project-effect.eu/case_studies/title-lorem-ipsum-dolor-sit-amet-consectetur/
Cooperative results-based bird conservation contracts (Flexible Grünlandbewirtschaftung mit Blick für Bodenbrüter	DE	https://www.kunoev.net/leistungen-und-projekte/wiesenvogelschutz/ https://project-effect.eu/case_studies/cooperative-results-based-bird-conservation-contracts/
Result-based payments for botanical grassland development in Beverhoutsveld	BE	https://www.project-contracts20.eu/wp-content/uploads/2021/03/C20_WP2_Factsheet_1_Beverhoutsveld_BE.pdf https://www.rbpnetwork.eu/country-infos/belgium/result-based-payments-for-botanical-grassland-development-in-beverhoutsveld-22/
Results-based agri-environment payment scheme for Southern Transylvania	RO	https://enrd.ec.europa.eu/sites/default/files/w12_resultbased_ro_popa.pdf
Conservation of grasslands and meadows of high natural value through support for local livelihoods	BG	https://drive.google.com/file/d/1q2US90f8QRUMXUsoy91L308gReLSq70v/view

Goal oriented promotion of biodiversity in the Canton of Zurich	CH	https://www.rbpnetwork.eu/country-infos/switzerland/goal-oriented-promotion-of-biodiversity-in-the-canton-of-zurich-28/
Result based nature conservation plan	AT	https://www.rbpnetwork.eu/country-infos/austria/results-based-nature-conservation-plan-enp-1/
Montado: Produzir e Conservar	PT	https://www.rbpnetwork.eu/country-infos/portugal/montado-produzir-e-conservar-payment-for-environmental-results-in-the-portuguese-montado-43/
Life connecting meados	EE	https://webgate.ec.europa.eu/life/publicWebsite/index.cfm?fuseaction=search.dspPage&n_proj_id=7586
Zitrus project	ES	https://www.forumforagriculture.com/zitrus-blog/
Viticulture on steep slopes in the Moselle valley	DE	https://drive.google.com/file/d/1L64SW2yfR9uQXCC8BKNeR1kaSjZZc_IG/view
BRIDE -Biodiversity Regeneration in a Dairying Environment	IRL	https://drive.google.com/file/d/1skp1bQfUr72swV6ZMb7xv579xOHONrc7/view
Biodiversity monitor for DAIRY farming	NL	https://drive.google.com/file/d/1NWsIQjf7CItBBHSCNHWk9eDy98H9qHXB/view
CarberyGreener Dairy Farms™ CGDF	IRL	https://drive.google.com/file/d/1PvdTkDO1kvuKHw1ObkvVGh0p3fpCytmo/view
Protecting farmland Pollinators	IRL	https://ec.europa.eu/eip/agriculture/en/find-connect/projects/protecting-farmland-pollinators; https://www.rbpnetwork.eu/country-infos/ireland/protecting-farmland-pollinators-17/
Hen Harrier Project	IRL	http://www.henharrierproject.ie/
Flemish nature management plan	BE	https://drive.google.com/file/d/18StyXD4Wsv7yfMhuGeV5qZ4VZRai-ZAE/view
Result and Value Based Agri-Environmental Payments to Landscape Elements and Forest edges	SE	https://www.rbpnetwork.eu/country-infos/sweden/result-and-value-based-agri-environmental-payments-to-landscape-elements-and-forest-edges-5/
Collective approach delivering habitats AECM Scheme 2016-2020	NL	https://www.rbpnetwork.eu/country-infos/netherlands/aecm-scheme-2016-2020-anlb-collective-approach-delivering-habitats-36/
3watErproject (LIFE+)	BE	https://drive.google.com/file/d/1pm6AzC9GGU_p54EE_EuIH8wDk-SpzxBA/view
Program “Flowering meadows”	PL	https://drive.google.com/file/d/1IbooJm9h1uMZdBAR1OEQQvut0WTmD6Jf/view
Cooperative rice production in coastal wetlands in Southern Spain	ES	https://drive.google.com/file/d/1vHMv6tA_svqkIuajS7mro5gOLR9dgMVB/view
LIFE in common lands	ES	https://www.lifeincommonland.eu/en/life-in-common-land-en
Proof of Ecological Performance (PEP) and Biodiversity payments	CH	https://www.rbpnetwork.eu/country-infos/switzerland/proof-of-ecological-performance-pep-and-biodiversity-payments-54/
Cooperation in Natura 2000 area	IT	https://drive.google.com/file/d/1BJWU-WAOM8Z9dFsyWDKBHGYbordztOEE/view
AgoraNatura - Online marketplace for certified nature conservation projects	DE	https://www.project-contracts20.eu/wp-content/uploads/2021/03/C20_WP2_Factsheet_8_AgoraNatura_DE.pdf
Bio-Babalsky	PL	https://drive.google.com/file/d/194RdpRyC9JsGll8JX3mlvJhiASRuyGXa/view
“The Wild Farm" organic farmers	BG	https://drive.google.com/file/d/1jfk4wcZ1-FOKljIYgoaafDBPfhdb2kxM/view
Organic honey from Stara Planina mountain sites	BG	https://drive.google.com/file/d/1_Eiv8o3zgLxq0_FIMT6-wkJ9zKtc8PMd/view
On-Farm Research Network	HU	https://www.biokutatas.hu/en/page/show/onfarm
Alternative Land Use Service	CAN	https://alus.ca/what-we-do/
Plan d’accompagnement agroenvironnemental (PrimeVert)	CAN	https://www.mapaq.gouv.qc.ca/SiteCollectionDocuments/Formulaires/ProgrammePrime-Vert2018-2023.pdf
Rural Water Quality Program (Dufferin Country)	CAN	https://www.nvca.on.ca/Pages/Rural-Water-Quality-Program.aspx
Partners for Fish and Wildlife Program	USA	https://www.fws.gov/partners/pdfs/2021-08-16_PFW_2020_AnnualReport_508.pdf
Environmental Quality Incentives Program	USA	https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid=nrcseprd1342638
Conservation Stewardship Program	USA	https://www.nrcs.usda.gov/wps/PA_NRCSConsumption/download?cid=nrcseprd1310101&ext=pdf
Iowa Farm Environmental Leader	USA	https://iowaagriculture.gov/farm-environmental-leader-awards
Sustainability Leadership Awards	USA	https://fieldtomarket.org/our-programs/awards-and-recognition/sustainability-leadership-awards/
Farm and Ranch Lands Conservation Program	USA	https://tpwd.texas.gov/landwater/land/private/farm-and-ranch/

Minnesota Conservation Reserve Enhancement Program	USA	https://bwsr.state.mn.us/mn-crep-landowners
Carbon+ Biodiversity Plot	AUS	https://www.agriculture.gov.au/ag-farm-food/natural-resources/landcare/sustaining-future-australian-farming/carbon-biodiversity-pilot
Enhancing Remnant Vegetation Plot	AUS	https://www.agriculture.gov.au/ag-farm-food/natural-resources/landcare/sustaining-future-australian-farming/enhancing-remnant-vegetation-pilot
Bush Tender	AUS	https://www.environment.vic.gov.au/innovative-market-approaches/bushtender