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Report

Environment and climate assessment of France's CAP Strategic Plan

Institute for European Environmental Policy



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INTRODUCTION

The European Union (EU) food system has considerable impacts on the climate and environment. In particular, research shows that European food systems are responsible for 30% of the continent's greenhouse gas (hereafter, GHG) emissions (Crippa et al, 2021). Agriculture is also the main pressure on biodiversity (through pesticide use, landscape simplification and the destruction of habitats), and is a significant contributor to soil degradation and reductions in water quality and availability. To try and address these issues, the European Commission developed new strategies in the framework of the European Green Deal: the Farm to Fork Strategy which aims to make food systems fair, healthy and environmentally-friendly, and the Biodiversity Strategy which aims to put Europe's biodiversity on the path to recovery by 2030. Both include targets related to agriculture (e.g. on area under organic farming, pesticide and fertiliser reduction). The Common Agricultural Policy (CAP)—which supports agricultural production in the EU through a system of interventions (previously known as measures)—is the main funding source the EU has for implementing the Farm to Fork targets and the transition of agri-food systems.

Created sixty years ago, the CAP is one of the oldest policies of the EU, and today benefits from around 30% of the total EU budget. Historically, the policy focused on increasing productivity and competitiveness as well as ensuring food production, fair income for farmers and reasonable prices for consumers. This helped maintain farming in places where it would have otherwise disappeared, but also contributed to the intensification and specialisation of agriculture, with negative impacts on the environment and climate. However, since the end of the twentieth century, environmental and climate aspects have been gradually integrated.

In 2018, the European Commission proposed a new structure for the CAP that came into force in Member States at the start of 2023. It includes a set of ten specific objectives: one cross-cutting on knowledge and innovation, three economic, three social, and three that are environment and climate related: climate action (specific objective D), the protection of natural resources (specific objective E) and the conservation of biodiversity (specific objective F). It is also based on a 'new delivery model' where Member States must submit a National Strategic Plan (also referred to in this report as: CAP Strategic Plan, Strategic Plan or the Plan) presenting, among other things: the country's needs for each specific objective, the interventions they plan to implement to address these needs, and the budget allocated to these interventions. These Plans must be approved by the European Commission to ensure that Member States will contribute to the EU wide objectives. This new structure was proposed to: a) shift to a performance-

and results-based approach; b) give more flexibility to Member States to adapt CAP support to local conditions and needs, and c) increase the CAP's impact in terms of sustainability. To assess performance, The European Commission requires Member States to set targets for a set of 'result indicators' (hereafter designated by R.[number]) linked to the different objectives.

This report is part of a series of assessments of CAP Strategic Plans, in Member States with large agriculture sectors and where the potential for addressing national and EU climate and environmental challenges is high. The assessments cover the Strategic Plans' likely contribution to climate mitigation and adaptation, natural resources, and biodiversity protection, in this case for France. France is one of the EU's major agricultural producers. With almost 18% of the total EU agricultural area¹, and around 400 000 farms² (Barry and Polvêche, 2022), France produced more than 18% of the total value of EU crop production and almost 15% of the value of EU animal production in 2017 (European Commission, 2019). In 2017, wine, cereals, milk and cattle production were the most important sectors in terms of production value.

France's CAP Strategic Plan was approved by the European Commission on 31 August 2021. This assessment focuses on interventions targeting agriculture (not forestry) in mainland France³ and is structured in five sections. First, it presents the general priorities set out by France in its Strategic Plan and the planned allocation of funding, in order to estimate the amount of funding targeting environmental and climate objectives. The three following sections explore the interventions proposed to contribute to climate mitigation and adaptation (section 2, specific objective (d)), natural resource protection, in particular water and soil (section 3, objective (e)) and the conservation and restoration of biodiversity (section 4, objective (f)). Then, the report presents the cross-cutting interventions that could contribute jointly to the three environmental objectives, i.e. those supporting cooperation, knowledge exchange and dissemination and advisory services, as well as innovative approaches. Finally, the conclusion summarises the results and proposes key recommendations to improve the environmental and climate contribution of the Strategic Plan.

¹ EU Agri-Food Data Portal: <https://agridata.ec.europa.eu/extensions/DataPortal/home.html>

² In 2016, French farms represented around 4% of EU farms according to the EU Agri-Food Data Portal. In 2020, they have an average area of 69 ha in the metropolitan area.

³ Interventions targeting the forestry sector, as well as those targeting Corsica and outermost regions are beyond the scope of the analysis provided in section 2 to 5.

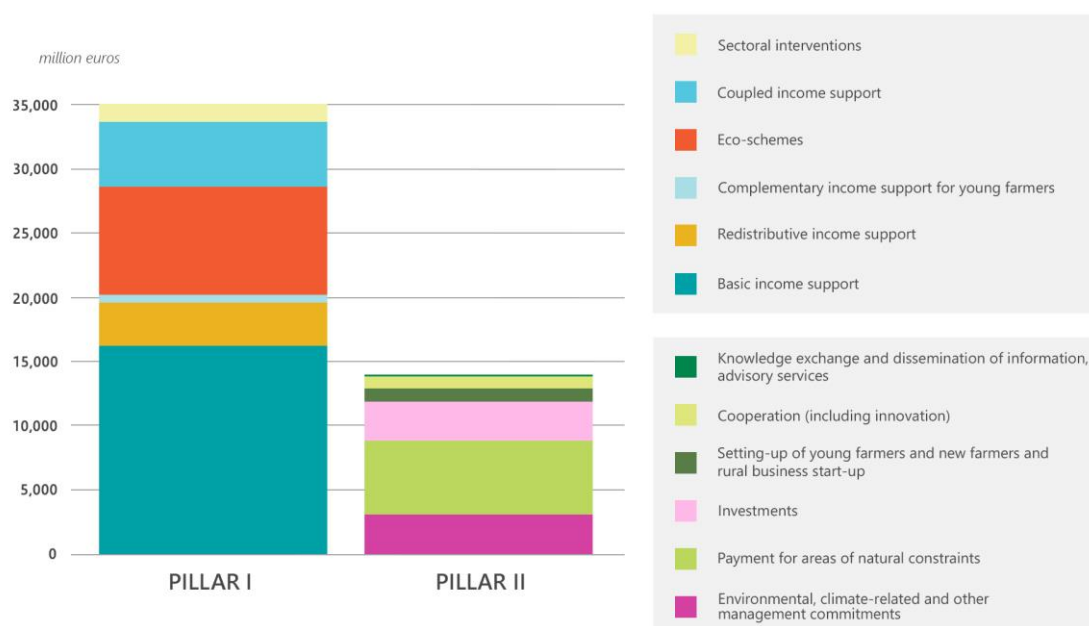
1. GENERAL OVERVIEW OF THE CAP STRATEGIC PLAN'S PRIORITIES: DOES THE MONEY GO TO ENVIRONMENTAL AND CLIMATE ACTION?

The French Strategic Plan emphasises the following four priorities: improving the sustainable competitiveness of the sector, creating value, resilience of farms and reducing input use for food security. With regard to the environment and climate, and in line with the European Green Deal, it emphasises crop diversification, the preservation of grasslands, mixed crop-livestock farming systems, the production of legumes, increasing the presence of ecological infrastructures, in particular hedges, and the development of organic farming.

Beyond these claims, an analysis of France's CAP budget allocation sheds initial light on the priority given to the different objectives in the Plan.

The CAP budget in France will be about 50 billion euros, out of which around 45 billion euros comes from the EU and 5 billion comes from national co-funding. CAP funding is divided between two funds, the European Agricultural Guarantee Fund (EAGF, also referred to as 'Pillar I') and the European Agricultural Fund for Rural Development (EAFRD, also referred to as Pillar II). Historically, the EAGF has focused on funding interventions related to income support, while the EAFRD is used to target rural development as well as environmental and climate objectives. However, interventions focusing on climate and environmental aspects have been gradually integrated in Pillar I since 2014, first through the 'greening' payment and now through the introduction of the eco-scheme.

Chart 1 shows below the allocation of France's CAP budget to different Pillar I and Pillar II interventions. Overall, for the upcoming period (from 2023 on) around 72% of the total CAP budget will go to Pillar I. This proportion is similar to the EU average, with around 75% of the total EU funding going to Pillar I. France is also planning to transfer almost 3 billion euros from Pillar I to Pillar II, suggesting a willingness to reinforce rural development and environmental and climate action.

Chart 1: Budget allocation for interventions in Pillar I and Pillar II (total public contribution, whole period)

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Source: Public version of the French Plan, available [here](#). The total public expenditure of some of the interventions was missing from the financial tables (e.g. risk management tools).

In order to guarantee a minimum budget ('ringfencing') for interventions benefiting public goods in all countries, the EU CAP Regulation states that all Member States must dedicate at least 25% of the funding for direct payments to eco-schemes and at least 35% of Pillar II funding to environmental, climate, organic and animal welfare commitments⁴. In the case of Pillar II, this ringfencing covers the following interventions: environmental, climate and other management commitments (formerly called agri-environmental and climate measures), compensation payments for area-specific disadvantages in relation to the Water Directive Framework and EU nature directives (in particular Natura 2000 areas), investments targeting these objectives, as well as 50% of the payments for areas of natural constraints (hereafter, ANC). France allocated the minimum of 25% of direct payments' budget to the eco-scheme (around 8.4 billion euros), whereas for Pillar II they exceeded the minimum, allocating 40% of Pillar II to environmental, climate, organic and animal welfare objectives (around 4 billion

⁴ <https://eur-lex.europa.eu/eli/reg/2021/2115/oj>, article 93 and 97. However, Member states are allowed, to a certain extent, to decrease their contribution to eco-schemes under certain conditions, for instance in the first years of implementation to fund other interventions, or if the environmental, climate, organic and animal welfare contribution of Pillar II exceeds 30%.

euros). However, much of this stems from France's large budget for ANC payments, which have uncertain environmental and climate impact (European Commission, 2021b, c). When these are no longer included, 23% of Pillar II funding contributes to the ring-fencing.

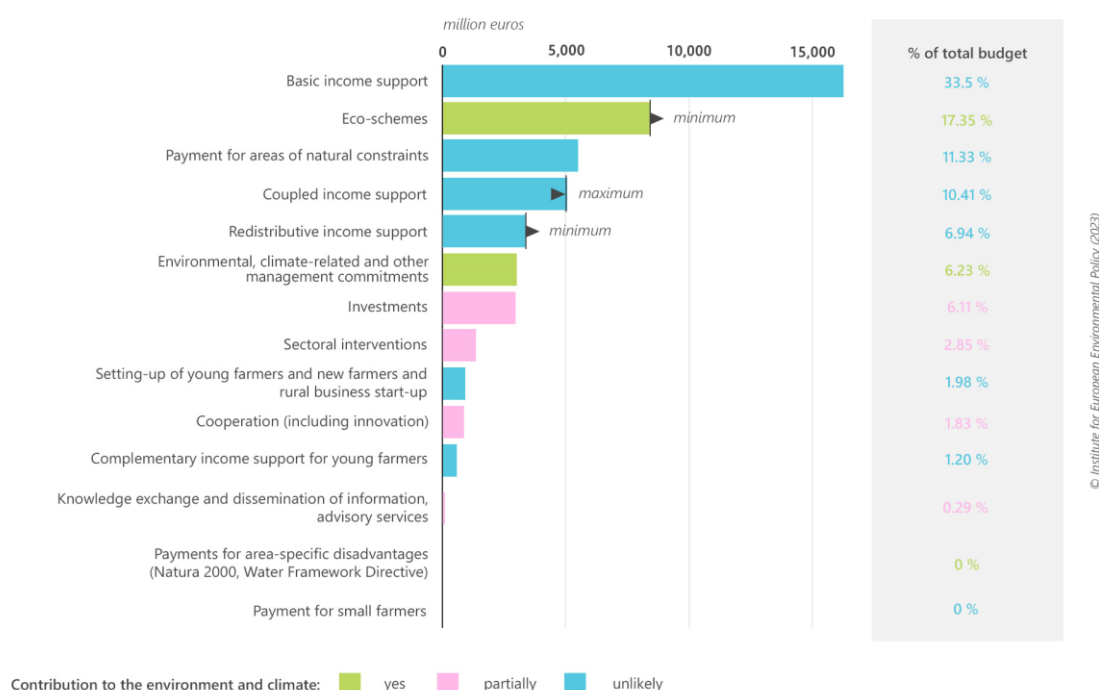
Looking at the detailed allocation of the CAP budget⁵ to the different types of interventions (see Chart 2 below), basic income support, which aims to support farmers' income, remains the most funded instrument, with a budget of 16 billion euros (33.5% of the total CAP budget). This is almost twice the eco-scheme budget and more than five times the budget for Pillar II environmental and climate commitments. Furthermore, the share of direct payments' budget dedicated to basic income support is planned to increase compared to the previous CAP (from 40.8% in 2015-2020⁶ to 48.3% in 2024-2028). Similarly, the share of the direct payments' budget allocated to coupled income support is set to increase from 10.8% in 2015-2020 to 15%⁷ in 2024-2028, reaching a total budget of 5 billion euros over the new CAP period. The budget for interventions contributing to green objectives (environment, climate, and marginally in the case of France, animal welfare) is 12 billion euros i.e. 24% of the total CAP budget. This includes Pillar I eco-schemes, 15% of the sectoral interventions targeting the fruit and vegetable sector, as well as PII environmental, climate and other commitments and non-productive investments (France does not have payments for area-specific disadvantages). While aid for productive investments might contribute (for instance by supporting the modernisation of buildings to improve their energy performance), it is not clear to what extent it will, as it also funds investments focusing on other objectives such as productivity improvements, on-farm transformation and diversification. For comparison, we estimate that around 32 billion euros contribute to the economic objectives of the CAP, corresponding to around 65% of the total CAP budget⁸. This suggests that CAP funding will remain focused on economic objectives in France for the upcoming period.

⁵ These estimations are based on the version of the French CSP published on the website from the French Ministry of Agriculture: <https://agriculture.gouv.fr/pac-2023-2027-le-plan-strategique-national>. There might be some differences between this version and the version from the Commission, in particular because France plans to transfer money from Pillar I to Pillar II beyond 2027, which is not yet authorised in the regulation. The total public expenditure is also not available in the published version for all interventions. For instance, for risk management tools, only the EU contribution is available, and amounts to 930 million euros.

⁶ <https://agridata.ec.europa.eu/extensions/DashboardIndicators/Financing.html>

⁷ This is the maximum allowed by the CAP Regulation.

⁸ We estimate that the following interventions contribute to economic objectives: All Pillar I interventions except the eco-schemes, as well as payment for area of natural constraints and risk management tools. Productive investments are not considered as some of them might contribute to environmental and climate objectives. Redistributive income support, complementary income

Chart 2: Budget allocated to different interventions (total public contribution, whole period)

Source: Public version of the French Plan, available [here](#). Interventions targeting specifically environmental and climate action are shown in green. Interventions coloured in pink might contribute to the environment and climate, but it is not sure how much. Interventions coloured in blue contributes to other CAP specific objectives. The total public expenditure of some of the interventions was missing from the financial tables (e.g. risk management tools).

The Plan associates each intervention⁹ with one or more specific objectives. For example, the eco-scheme is linked to the specific objectives on climate, resources and biodiversity. However, not all eco-scheme (see Box 1) options contribute to all three environmental objectives and the Plan does not provide details on the share of the eco-scheme budget contributing to each. It is therefore challenging to correctly estimate the budget allocated to each of the environmental and climate specific objectives. Furthermore, while the allocation of budget and, when available, the output area targeted under each interventions provide an indication of the priorities set in the Plan, they do not give information about the potential effectiveness of the interventions that are funded under each. Therefore, in the next sections, we explore the environmental and climate objectives and discuss

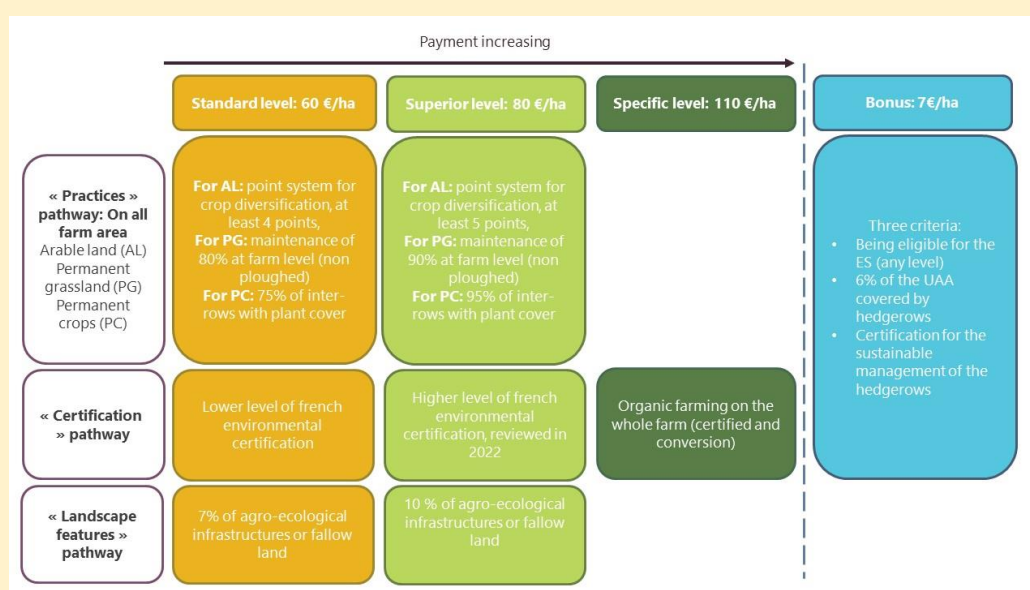
support for young farmers and payment for areas with natural constraints also contribute to social and rural development objectives, but we included them as they support the income of specific farmers' populations.

⁹ For Pillar II, these were referred to as 'measures' in the previous CAP. The term interventions now covers both Pillar I and Pillar II schemes or instruments.

the potential contribution of France's related interventions. We will focus mostly on the main interventions contributing to environmental and climate action (e.g. eco-schemes in Pillar I, environment and climate commitments from Pillar II), as well as on those that could potentially be harmful (e.g. coupled income support for cattle).

Box 1: The French eco-scheme

Figure 1: Presentation of the French eco-scheme



Source: Authors, based on the Plan

The French CAP Strategic Plan proposes a single framework intervention for its eco-scheme where farmers can choose between 3 options (called 'pathways'): the "practices" pathway, the "certification" pathway and the "landscape features" pathway. In each option, farmers can decide between different levels of commitment (2 or 3 depending on the options), with higher levels receiving a higher payment. These three pathways can therefore be seen as three different exclusive eco-schemes (they cannot be combined).

Within the "practices" pathway, farmers have to adopt specific practices on all their farmland (crop diversification on arable land based on a point system, inter-rows cover in permanent crops and maintenance of unploughed permanent grassland, when these types of land represent more than 5% of their UAA).

Within the "certification" pathway, farmers that have an Environmental Certification, a High Environmental Value (HVE) Certification or an Organic Certification can receive a payment, each of these types of certification leading to different levels of payment.

With these two options, farmers can also apply for a bonus if 6% of their UAA is covered by hedgerows and they are managed sustainably (certification required).

Finally, farmers can choose the "landscape features" pathway, that builds on GAEC 8. It required farmers to have at least 7% of their UAA covered by landscape features and fallows (10% for the superior level of the eco-scheme). This option cannot be combined with the hedgerow bonus.

The eco-scheme takes the form of a lump-sum payment added to the basic income support. It is not based on any income foregone and additional costs linked to the adoption of the practice. According to the Strategic Plan, "the approach responds to a logic of payments for environmental services and remuneration of a degree of effort made by each beneficiary with regard to its production system". Yet, no estimation was provided for these services, and it rather seems like the amount was chosen based on the total budget and an estimated number of potential beneficiaries. As such, the level of payment is not truly aligned with the ecological impact of the required practices and a variety of practices, with different levels of ambition, are funded at the same payment level. For example, at the standard level, an arable farmer having 7% of landscape features and fallow on their UAA receives the same payment as another one growing four cereals and oilseed crops, even though the latter option requires less effort. A farmer might therefore choose the easiest or least costly option (in the case of arable farms, the "practices" pathway that requires low diversification) even if its environmental benefits are much lower than those of another option (e.g. the "landscape features" pathway).

The "certification" pathway is also problematic. Indeed, the superior level requires the HVE certification, but its recent assessment showed that, for most farming systems, the environmental performance of HVE-certified farms differs little from that of average farms (Epices and Asca, 2022). As the criteria for the standard level payment are even less demanding, the

environmental impacts on farms choosing this eco-scheme will most likely be negligible.

Overall, and according to some estimations from the French ministry of agriculture, most farmers will automatically receive the ES without changing their practices (79%) while 13% more can receive it by changing their practices on only 5% of their UAA (Gérard and Girard, 2021).

2. CONTRIBUTION TO CLIMATE MITIGATION AND ADAPTATION

This section focuses on the standards of Good Agricultural and Environmental Conditions¹⁰, hereafter GAEC standards, and the interventions in France's Strategic Plan that contribute to reducing GHG emissions, carbon storage and climate adaptation.

2.1 GHG emissions reduction

2.1.1 State of play in France and resulting needs

French agriculture produces CO₂, but also methane (CH₄) (45% of its agricultural GHG emissions) and nitrous oxide (N₂O, 42%) which both have higher global warming potential than CO₂ (by around 25 and 300 times, respectively)¹¹. Methane emissions from the agricultural sector come mainly from enteric fermentation and manure spreading while nitrous oxide comes from crop fertilisation. The rest is CO₂ from the energy consumption of agricultural machinery, accounting for 13% of the sector's emissions. GHG emissions from agriculture decreased by 8% between 1990 and 2019, due to the decrease in livestock numbers and mineral fertiliser use. Overall, GHG emissions from French agriculture represent 18% of total national emissions, a proportion significantly higher than the EU average of 11 % (EC, 2020). Therefore, France needs to further reduce its agricultural GHG emissions, in particular from livestock systems and crop fertilisation, if it wants to achieve its 2030 GHG emission reduction target for the sector (-18% compared to 2015) (Ministère de la transition écologique et solidaire, 2020c).

Decreasing farm animal numbers (especially cattle), improving manure and slurry management and reducing the use of fertilisers would be the most efficient way to reach these objectives¹². The Strategic Plan should therefore support mixed crop-livestock systems and extensive livestock systems fostering a reduced

¹⁰ The standards of Good Agricultural and Environmental Conditions (GAECs) are defined in the framework of the so-called conditionality. In order to ensure that all agricultural land is maintained in good agricultural and environmental conditions, Member States shall define these minimum requirements on the basis of Annex III of Regulation (EU) No 2021/2115.

¹¹ <https://www.notre-environnement.gouv.fr/themes/climat/les-emissions-de-gaz-a-effet-de-serre-et-l-empreinte-carbone-ressources/article/les-emissions-de-gaz-a-effet-de-serre-de-l-agriculture>

¹² Measures to reduce livestock numbers should come with wider action on meat and dairy consumption, to avoid replacing these products with imports i.e. carbon leakage to third countries.

livestock density on lands, local sourcing of animal feed through permanent grassland and legume production, as well as low intensity crop systems.

2.1.2 Planned interventions

Table 1 below presents the Strategic Plan interventions and standards that are explicitly mentioned by France as targeting GHG emissions reductions, as well as others not mentioned as contributing to this objective, but that we judge to be relevant. We also assess their main benefits and limitations in the Table, and whether they are mentioned in the Plan as contributing to specific objective (d) on climate. The budget of each intervention is provided in the Annex.

France only mentions two types of interventions addressing the need to reduce GHG emissions in agriculture: coupled income support for grain and fodder legumes and an environmental and climate commitment targeting soil protection and quality. Support for seed and fodder legumes can help to reduce GHG emissions by fostering nitrogen-fixing crops, thus diminishing the need for mineral fertilisation, and by providing feed for livestock, thus reducing the risk of carbon leakage from imports from third countries, such as soya from Brazil. According to the Plan, the funds allocated to this support will increase by almost €100m between 2022 and 2027, making it possible to double the area under legumes (to 2 million hectares, 7% of France's utilised agricultural area (UAA)) and generating, all other things being equal, an avoidance of GHG emissions estimated at between 1.5 and 1.6 million tons of CO₂ equivalent (MtCO_{2e}) i.e. 1.8% of France's agricultural emissions in 2019. However, it is important to note that coupled income support for grain legumes can have detrimental impacts on the environment when it supports intensively produced crops (e.g. soy) grown with high quantities of chemical inputs such as pesticides. It would thus be more effective to target legume production systems that employ sustainable management practices.

While they are not mentioned in the Plan, other conditionality standards and interventions could contribute to reducing GHG emissions. This is the case, for instance of the support for conversion to organic farming, whose budget is planned to increase by 36% in the new CAP period¹³ and the support for maintenance of organic farming under the eco-scheme. Organic farming will reduce emissions linked to the manufacture, transportation and field use of synthetic nitrogen fertilisers. Several environmental and climate commitments targeting fertiliser management and GHG emission reductions might also

¹³ France stopped supporting the maintenance of organic farming systems under Pillar 2 in 2017. In the new CAP, it is funded through an eco-scheme.

contribute, but their impact is likely to be negligible given that they have relatively small budgets and are likely to target small areas¹⁴.

While many interventions might contribute to decreasing GHG emissions from fertiliser use, not much is proposed to reduce enteric emissions from livestock farming. In fact, there are still interventions supporting livestock production specifically such as the coupled income support for cattle. The Plan mentions that its modalities are changing in the new CAP to favour small-scale, low-intensity grassland livestock systems. The new support¹⁵ limits the overall number of livestock units that can be supported to 120 livestock units (LSU) and a stocking density of 1.4 times the forage area of the farm. However, on all farms, 40 LSU are exempt from complying with the stocking density requirements. Among small farms, it therefore favours those with a higher stocking density¹⁶. Because the ceiling of 120 LSU is tighter compared to the current programming period, and because coupled support represents an important share of the gross product in suckler farming, France expects that this switch will encourage farmers not to keep cows beyond this ceiling (corresponding to around 80 cows), leading to a reduction in the total herd (-220,000 cows, corresponding to 5.7% of the herd) and thus in emissions (-500,000 tCO₂e per year) (Ministère de l'Agriculture et de la Souveraineté Alimentaire, 2022). However, coupled support may also be maintaining livestock numbers at higher levels than they might be otherwise if there was no support, meaning GHG reductions could have been larger without it. Some researchers have therefore highlighted the need to phase out this kind of support since they are not the best tool for income support and productivity while being negative for the climate (Peyraud and MacLeod, 2020).

In summary, the Plan generally focuses on reducing emissions from crop production, that is, mainly, from mineral fertilisation, and within that, by supporting legumes. Very few interventions target GHG emissions from livestock production. This is reflected in the fact that France has chosen not to define a

¹⁴ To date, the public version of the French Strategic Plan does not provide the output targets linked to each of these interventions. This information would be valuable as it would indicate the share of the agricultural area and the number of livestock units supported by each intervention. It is likely to become available in a later version of the Plan.

¹⁵ Two levels of payments are proposed: a basic level for all types of cattle (beef and dairy) provided certain conditions on age and length of stay on the farm are met (60€/LSU in 2024), and a superior level for suckler cows and males specifically (110€/LSU in 2024). There is a specific ceiling for the basic level: only 40 LSU can be supported with this payment.

¹⁶ For example, a farm with 70 eligible LSU and 25 ha of forage area can receive a payment for 40 LSU, whereas it could only receive a payment for 35 LSU if it had to comply with the maximum stocking rate. It thus receives more than a farm with 35 eligible LSU and 25 ha, despite having a substantially higher stocking rate (Chambre d'agriculture de Bretagne, 2022).

target for indicator R.13 (Share of livestock units (LSU) under supported commitments to reduce emissions of greenhouse gases and/or ammonia, including manure management).

Table 1: Potential impact of interventions on GHG emissions

Source of emissions	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
GHG emissions from crops	GAEC 3 ban on burning arable crops	+ : continue to prevent the release of GHG in the atmosphere - : no requirement on the incorporation of residues, maintenance of existing practice (low additionality) (European Commission, 2021c)	No
	Coupled income support for grain and fodder legumes (32.06 to 32.08)	+ : reduction in fertiliser use and in emissions leakage from imports - : risks for biodiversity for some intensively cultivated crops (e.g. soybeans)	Yes
	Support for organic farming (30.01 eco-scheme and 70.01 conversion to organic farming)	+ : reduction in chemical fertiliser use, increased budget for conversion by 36% compared to the current CAP, relatively large area supported (11.71 % of the UAA in 2028, according to result indicator R.29 on organic farming) - : low level of support for maintenance compared to previous years (110€/ha vs. 160€/ha in 2015 for arable crops (IFOAM, 2016))	No
	Environmental and climate commitments targeting fertiliser management (70.06 and 70.07 on water quality)	+ : includes several measures on fertiliser management - : no information on the share of the interventions' budget that will be allocated to these potentially beneficial measures	No
	Environmental and climate commitment targeting soil protection and quality (70.08)	+ : introduction of leguminous crops potentially leading to reductions in fertiliser use - : no indication on the threshold for the minimal area with leguminous crops, small area likely to be targeted and small budget allocated	Yes

	Environmental and climate commitment supporting the transition of practices (70.27) specifically the reduction of the carbon footprint	<p>+: result-based approach. One sub measure requires a GHG emissions assessment of farms and a reduction of emissions by at least 15% compared to a benchmark set in a diagnosis</p> <p>-: small areas likely to be targeted and low budget, meaning likely to lead to insignificant GHG emissions reductions</p>	No
	Aid for productive investments (73.01)	<p>+: funds investments in precision technologies that can reduce fertiliser use</p> <p>-: not clear how much of the budget will be targeting emissions reduction (no environment and climate ringfencing)</p>	No
GHG emissions from livestock	Environmental and climate commitment targeting climate and feed autonomy (70.09)	<p>+: supports extensive livestock systems and mixed crop-livestock systems (maximum livestock load, maximum maize silage area and maximum imports of feed concentrate, minimum share of grassland and pasture) thus reducing GHG emissions from growing feed abroad; third most funded environmental and climate commitment</p> <p>-: effectiveness will depend on the specifications chosen at the local level (maximum livestock loads, etc.)</p>	No
GHG emissions from energy consumption	Aid for productive investments (73.01)	<p>+: targets energy savings and modernisation of buildings and greenhouses to improve their energy performance</p> <p>-: not clear how much of the budget will be targeting emissions reduction (no environment and climate ringfencing)</p>	Yes

2.2 Carbon storage

2.2.1 State of play in France and resulting needs

The Land Use and Land-Use Change and Forestry (LULUCF) sector in France is a net carbon sink, thanks to grassland and forest areas (Hulot and Pagnon, 2021). This sector absorbed 14 MtCO₂e in 2020 and made it possible that same year to offset 3.6% of total GHG emissions from other sectors (CITEPA, 2022). However this carbon sink has dramatically decreased since the mid-2000s when it was around -45 Mt CO₂e, primarily because of a decrease in forest sinks and grassland sinks (-48% and -14% respectively between 2010 and 2020). In agricultural areas, support for the protection of grasslands, in particular non-ploughed permanent grassland, is necessary for climate change mitigation. For cropland, emissions decreased by 33% between 2010 and 2020 (CITEPA, 2022). According to a study realised by INRAE in 2021, there is potential in France to increase carbon storage in agricultural soils through the implementation of specific land management practices, in particular on arable land. Storage practices include: intermediary/interim crops, direct seeding, temporary grassland, agroforestry, adding organic resources to soils (e.g. compost), hedgerows and inter-row vegetated cover in vineyards (Pellerin et al, 2021).

2.2.2 Planned interventions

There are numerous measures that are likely to contribute to carbon storage in agricultural soils and biomass in the French Strategic Plan. Interestingly, they target all types of land (grassland, arable land and permanent crops). The French eco-scheme (see box 1 below), for instance, supports unploughed permanent grassland, inter-rows plant cover in perennial crops, agro-ecological infrastructures, hedgerows and fallow that all store carbon. While it is likely to target a significant land area, the Plan does not give any indication on its corresponding carbon sequestration potential.

The Plan also mentions that payments for areas facing natural or specific constraints (ANC) contribute to carbon storage by supporting the maintenance of farms and grassland systems in remote areas. However, the positive impact on climate mitigation is not a given, as it depends on farmers' practices on the land (European Commission, 2021c). For instance, it does not prevent the ploughing and reseeded of grassland. For this reason, support for ANC can be considered at best only partially relevant to the objective of climate action.

In total, France plans to have approximately 26% of its UAA under commitments to enhance carbon storage (target for R.14¹⁷), covering a wide variety of practices and types of land. However, there is no support for agroforestry (e.g. silvo-pastoral systems) beyond the support for hedges and trees through eco-schemes and investments. Such support could contribute to the development of farming systems that are both economically viable and environmentally beneficial.

Table 2 below presents the Strategic Plan interventions that are likely to contribute to increasing carbon storage in agricultural soils, their main benefits and limitations, and whether they are mentioned in the Plan as contributing to specific objective (d) on climate.

Table 2: Potential impact of interventions on carbon storage

Carbon stock	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
Woody landscape features	GAEC 8 landscape features and fallow	+ : carbon storage in woody landscape features and in soils (e.g. in fallow) - : not implemented in 2023 (use of derogation), exemption for: small farms (<10ha), farms with grassland, leguminous plants and fallow on more than 75% of their UAA)	No
	Eco-scheme for landscape features and bonus (30.01)	+ : supports biodiversity rich landscape features (inc. fallow) and hedgerows - : the level of payment might be too low to cover maintenance costs and/or income forgone, especially in profitable arable farms	Yes
	Environmental and climate commitment on the sustainable maintenance of agro-ecological infrastructures (70.14)	+ : supports carbon storage through the sustainable maintenance of woody landscape features and fallow - : relatively small budget (€35m, around 0.3% of PII budget) and small area likely to be targeted	No

¹⁷ Interventions included in the calculation of R.14 : the eco-scheme, support for organic farming in PII (both conversion everywhere and maintenance in outermost regions), two environmental and climate commitments, one on soil quality (70.08) and one regions for grassland associated with livestock in outermost regions (70.19). This indicator therefore does not include all the interventions listed in the Table 2.

	Aid for productive investments (73.01)	+ : support for the establishment of hedges and agroforestry - : not clear how much of the budget will target the establishment of hedges and agroforestry	No
	Aid for non-productive investments (73.02)	+ : funding for planting hedges and trees - : small budget (less than €35m in mainland France)	Yes
Arable land (soils)	GAEC 7 on crop rotation	+ : increased soil organic carbon - : use of derogation for the year 2023, exemptions for: maize seed production, small farms (<10ha), farms with grassland, leguminous plants and fallow on more than 75% of their UAA), and organic farms, crop rotation only mandatory on 35% of the land every year	No
	Support for organic farming (30.01 eco-scheme and 70.01 conversion to organic farming)	+ : organic farming systems have been shown to have higher soil organic matter content, soil organic stocks, and soil organic carbon sequestration rates than conventional systems - : low level of support for maintenance compared to previous years (110€/ha vs. 160€/ha in 2015 for arable crops (IFOAM, 2016))	Yes
	Environmental and climate commitment targeting soil protection and quality (70.08)	+ : promote agricultural practices that maintain organic matter in soils, including direct seeding and soil cover - : small area targeted and budget allocated	Yes
Permanent grassland (soils)	GAEC 1 on permanent grassland	+ : maintenance of carbon stocks. Authorisation system triggered when more than 2% of permanent grassland is converted (goes beyond the EU CAP Regulation's requirements) - : France's definition of permanent grassland allows ploughing, thus reducing the potential benefits of maintaining permanent grassland; the ratio has to be maintained at the regional level rather than at the agricultural holding level so more valuable grasslands can be lost in favour of less valuable ones elsewhere	No
	GAEC 9 on permanent grassland in	+ : maintenance of carbon stocks, ban on ploughing (required in the EU CAP regulation)	No

	Natura 2000 areas	-: only includes sensitive grassland, defined as pastoral areas and grassland with high biodiversity value that are located in Natura 2000 areas	
	Eco-scheme, practices pathways (30.01)	+ : supports non-ploughed permanent grassland (80 or 90% of the farm grassland has to remain unploughed every year depending on the level of payment) - : no indication on how many farms are already complying with this requirement, and therefore on the potential additional benefits of the scheme	Yes
	Environmental and climate commitment targeting climate and feed autonomy (70.09)	+ : supports extensive livestock systems and mixed crop-livestock systems (sets a minimum share of grassland and pasture) thus reducing GHG emissions from growing feed abroad; third most funded environmental and climate commitment; - : effectiveness will depend on the maximum thresholds chosen at the local level	No
	Payment for areas of natural constraints (71.01-03)	+ : supports the maintenance of grassland systems in some areas, thus contributing to carbon sequestration; higher level of payments for wet grassland and lower livestock densities - : not linked to specific additional practices that are good for carbon storage (e.g. ban on ploughing), likely to have a marginal (or null) impact (Alliance Environnement and Ricardo-AEA, 2018)	Yes
Permanent crops (soils)	Eco-scheme, practices pathways (30.01)	+ : supports plant cover in inter-rows in perennial crops - : no indication on how many farms are already complying with this requirement, and therefore on the potential additional benefits of the scheme, concerns a very limited number of hectares as many permanent crops producers are not eligible for this payment (because they are not eligible for basic income support)	Yes
Peatland and Wetland (soils)	GAEC 2 on wetland and peatland restoration and protection	- : not starting before 2025, unknown area of peatland in France (likely to be small), unknown overlaps between peatland/wetland area and agricultural areas, unknown agricultural practices in these areas, requirements not defined at this point	No

2.3 Climate adaptation

2.3.1 State of play in France and resulting needs

In France, agriculture is threatened by droughts and floods, whose frequency and intensity have increased—and will increase further—with climate change. For example, the area affected by droughts has increased from about 5% in the 1960s to over 10% today (Ministère de la Transition écologique et de la Cohésion des territoires, 2022). The expected increase in average temperature will lead to more frequent heatwaves and outbreaks of pests and diseases (European Commission, 2020). These phenomena will have different effects on farm activities depending on the region and the type of farms, impacting animal and plant health, thus increasing phytosanitary pressures and negatively impacting yields, quality of agricultural products and farmers' income.

It is therefore necessary to adapt production systems to new climate and geographical conditions: relocating production, adapting the types of crops cultivated, improving the efficiency of irrigation systems whilst not expanding irrigation in areas subject to water stress, developing cooling systems in stables, shelters, and adapting transports for livestock, in combination with the reduction of herd sizes. Nature-based solutions, such as the creation of landscape features, that improve soil moisture, water regulation and retention capacity in soils and provide shade for livestock can also contribute positively to climate adaptation in agriculture. As underlined in the new EU strategy on adaptation to climate change, nature-based solutions are particularly well suited for resilience to water-related stressors (European Commission, 2021a).

2.3.2 Planned interventions

Table 3 below presents the interventions in the French Plan that are likely to contribute to climate adaptation in agriculture, their main benefits and limitations, and whether they are mentioned in the Plan as contributing to specific objective (d) on climate.

Several GAEC standards and interventions are likely to contribute to climate adaptation in the French Strategic Plan. First, multiple sectoral interventions target the adaptation of crop systems by supporting investments, advisory and technical assistance services, training, and information sharing for fruits and vegetables, wine and olive oil production, in order to improve productivity and sustainability. For instance, they include investment aid for specific equipment to combat hail, protect against frost and combat drought. For other crops and for livestock systems, farmers can also receive support for productive investments, funding equipment for protection against climatic and sanitary hazards and to

improve animal welfare and living conditions, irrigation projects and the establishment of hedges and agroforestry to some extent. However, overall, only 5% of French farms are anticipated to benefit from CAP investment support contributing to climate change mitigation and adaptation, and to the production of renewable energy or biomaterials (result indicator R.16). For comparison, almost 74,000 farmers (around 18%) are anticipated to benefit from modernisation investments (e.g. for construction, acquisition and modernisation of buildings).

The French Strategic Plan also includes measures supporting practices that make crop and livestock systems more resilient to the impacts of climate change. For instance, the environmental and climate commitment 'Climate, animal welfare, and feed autonomy' (70.09, see section 5.2) supports extensive and mixed crop-livestock systems, notably those based on pasture and grazing, which are more resilient to climate change. The Plan also mentions that the eco-scheme could contribute to improving the climate resilience of French farms, through increased requirements for crop diversification, support for landscape features, fallow land and hedgerows. However, the criteria for crop diversification remain weak, allowing some farms to receive a payment with only 4 different types of cereals and oilseeds (see box 1). Furthermore, the criterion used to support landscape features and set-aside requires a minimum *average* share of 7% at farm level, but a farm can receive the eco-scheme payment and still have only 4% (as required by GAEC 8) on the arable areas of the farm, where the adaptation benefits would be highest.

Finally, France proposes risk management tools such as insurance premium payments. However, these measures are not conditional on the adoption of adaptive practices, such as the implementation of protective measures (e.g. hedges and shade trees), the reduction of the size of agricultural plots or crop diversification. They might thus encourage farmers to further specialise or choose inappropriate or high-risk crops, which would in turn reduce farms' resilience (Müller, Johnson and Kreuer, 2017).

Overall, although several interventions contribute to climate adaptation, some practices that could increase farm resilience are not supported by the French Strategic Plan. For instance, no intervention aims at supporting more suitable crops in areas where drought will be more frequent. In some cases, water-intensive crops are even favoured. This is the case, for example, with maize seed production, which is exempt from the basic conditions on crop rotation (GAEC 7). In addition, most of the support aiming to improve climate adaptation focuses on increasing farm's economic resilience through investments in technological

improvements rather than using nature-based solutions, which would lead additional benefits for the environment and climate.

Table 3: Potential impact of interventions for climate adaptation

Type of system	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
Crop systems	GAEC 7 crop rotation	<p>+: crop rotation improves the climate resilience of crops and delivers a range of ecosystem services (e.g. improved soil quality) (EEA, 2019a), nature-based solution that will lead increase the resilience of the whole ecosystem and provide additional benefits to the environment</p> <p>-: use of derogation for the year 2023, important exemptions: small farms (<10ha), farms with grassland, leguminous plants and fallow on more than 75% of their UAA, and organic farms, crop rotation only mandatory on 35% of the land every year, exemptions for maize seed production</p>	No
	Sectoral interventions for fruits and vegetables, wine and olive oils (50.01a, 50.01a(bis), 50.01b, 50.01c, 50.01g, 50.01i, 58.01, 64.01b, 64.01c)	<p>+: supports investments, advisory and technical assistance services, training, and information sharing for fruits and vegetables, wine and olive oil productions, including support for climate adaptation investments (e.g. for equipment to protect against hail and frost and to combat drought)</p> <p>-: no indication on the share of the budget for wine and olive oil interventions that targets environmental and climate action</p>	Yes
	Aid for productive investments (73.01)	<p>+: funds equipment for protection against climatic and sanitary hazards, irrigation projects (with requirements on water savings, in particular in water-stressed areas) and investments linked to hedges and agroforestry</p> <p>-: not clear how much of the budget will be targeting climate adaptation (no environmental and climate ringfencing)</p>	Yes

Livestock systems	Environmental and climate commitment targeting climate and feed autonomy (70.09)	<p>+: supports extensive and mixed crop-livestock systems, notably those based on pasture and grazing (requirements include notably a minimum share of grassland and pasture on the UAA), that are more resilient to climate change; third most funded environmental and climate commitment; nature-based solution that will lead increase the resilience of the whole ecosystem and provide additional benefits to the environment</p> <p>-: effectiveness will depend on the specifications chosen at the local level.</p>	Yes
	Aid for productive investments (73.01)	<p>+: investments for improving animal welfare (e.g. access to the outdoor, ventilation conditions in buildings, etc.)</p> <p>-: not funding nature-based solutions, not clear how much of the budget will be allocated to these projects, might support intensive farms</p>	Yes
	Coupled income support for cattle (32.04)	<p>+: the Plan mentions that it will contribute to climate adaptation because some of the payments will go to extensive livestock systems, that are most resilient to climate change</p> <p>-: not linked to practices that improve farms' resilience; intensive livestock farms, that are not resilient to climate change, can still receive a payment without changing their system (even with the requirements)</p>	Yes, to some extent
All systems (farm level)	Risk management tools (76.01 and 76.02)	<p>+: supporting farms in the face of climate hazards</p> <p>-: might encourage farmers to further specialise or choose inappropriate or high-risk crops, thus reducing agronomic resilience, does not encourage adaptation practices</p>	Yes, to some extent
All systems (landscape level)	GAEC 8 landscape features	+: landscape features can provide shade for livestock, improve soil quality, thus increasing resilience in the face of climate change; nature-based solution that will lead increase the resilience of the whole	No

		ecosystem and provide additional benefits to the environment. -: use of derogation for the year 2023, exemptions of small farms (<10ha), farms with grassland, leguminous plants and fallow on more than 75% of their UAA	
	Eco-scheme, practices pathway and landscape features pathway (30.01)	+: support for crop diversification, landscape features and fallow land, hedgerows, nature-based solutions -: weak criteria for crop diversification (allowing some farms to receive a payment with only 4 different types of cereals and oilseed), weak targeting for landscape features and fallow (minimum share of 7% at farm level, but possible to have only 4% on its arable land, where the adaptation benefits would be highest)	Yes, to some extent
	Aid for non-productive investments (73.02)	+: funds planting of hedges and trees -: small budget (less than €35min mainland France)	No

3. CONTRIBUTION TO THE PROTECTION OF NATURAL RESOURCES

The following sections focus on interventions contributing to the protection of water quality, water availability and soil quality in the French Strategic Plan.

3.1 Water quality and availability

3.1.1 State of play in France and resulting needs

The quality of water ecosystems is assessed by the ecological and chemical status¹⁸ of surface water bodies and the chemical status of groundwater bodies. Overall, more than 70% of surface waters and 54% of groundwater in France are affected by agricultural diffuse pollution, mainly from fertiliser and pesticide use. In 2015, around 55% of France's surface water bodies were in less than good ecological status and 16% were failing to achieve a good chemical status (Ministère de la transition écologique et solidaire, 2020b). For groundwater, around 31% are not in good chemical status (European Commission, 2020). Overall, more than 70% of surface waters and 54% of groundwater in France are affected by agricultural diffuse pollution, mainly from fertiliser and pesticide use. Nevertheless, water quality has improved over the years, with nitrate pollution in rivers decreasing by 12% between 1998 and 2017 (Office Français de la Biodiversité, 2022b) and pesticide pollution falling by 20% between 2008 and 2018 (Office Français de la Biodiversité, 2022a). However, water pollution remains high in some regions, notably in Brittany due to the high density of livestock, as well as in areas of intensive crop production such as the Parisian basin and northern France (Commissariat général au développement durable, 2018b; European Commission, 2020).

Water availability can be assessed by the quantitative status of groundwater. In 2015, around 90% of groundwater was meeting good quantitative status in France (European Commission, 2020), suggesting that water remains available overall. Withdrawals for agricultural irrigation (two-thirds of which are from surface water) represent 10% of overall water abstraction, and have been decreasing by 50% between 2000 and 2019 (Commissariat général au développement durable, 2018b; European Environment Agency, 2022). However, a recent report shows that the proportion of agricultural area under irrigation

¹⁸ Chemical status relates to the presence of regulated chemical pollutants. Ecological status is an assessment of the quality of the structure and functioning of surface water ecosystems (European Environment Agency, 2020).

grew by more than 14% between 2010 and 2020 and that this increase affects all mainland areas in France (France Nature Environnement, 2022). Some regions, in particular the south-west where maize production is significant, face water deficits leading to restrictions in summer¹⁹, and they are likely to become more frequent as the frequency of droughts increases with climate change. The French Senate foresees that in 2050, the average drop in groundwater recharge in France will be between 10 and 25% (Sénat Français, 2019). A drop in the average annual flow of watercourses is also expected, by around 10 to 40% by 2050 (ibid.).

France therefore needs to further reduce pollution from fertiliser and pesticide use. To this end, France could support practices leading to reductions in pesticide use (e.g. crop rotation) and nutrient surplus (e.g. use of legumes), as well as in nutrient leaching and run-off (e.g. buffer strips along water courses).

To ensure water availability, France also needs to reduce water abstraction for agriculture and limit the area under irrigation. Reducing abstraction for irrigation, especially during summer, can be achieved with reuse of water or by growing crops with low water requirements in dry regions (e.g. to replace maize production in the South of France). Soil management practices that increase soil retention capacity (e.g. establishment of hedges, soil cover and no-tillage) can also contribute. These are discussed in the next section.

More efficient irrigation can also reduce the amount of water abstracted. However, the evaluation of the impact of the previous CAP on water shows that irrigation investments, even if they must comply with water saving requirements, can have detrimental impacts on water use, for example where they lead to expansion of the overall irrigated area (Alliance Environnement, 2020). In addition, a modernised irrigated area can be associated with a shift to crops that are more demanding in terms of water, or prevent a shift to types of production that are more adapted to using less water. The report of the CAP evaluation concludes that it remains difficult to guarantee that investments in more efficient irrigation are beneficial to waterbodies, especially if the irrigated area increases where water bodies are under stress, which is likely to happen given the general increase in irrigated area in France since 2010 (Alliance Environnement, 2020).

Soil management practices that increase soil retention capacity (e.g. establishment of hedges, soil cover and no-tillage) can also contribute. These are discussed in the next section.

¹⁹ <https://www.statistiques.developpement-durable.gouv.fr/leau-en-france-ressource-et-utilisation-synthese-des-connaissances-en-2021?rubrique=&dossier=215>

3.1.2 Planned interventions

There are numerous measures targeting water quality and quantity in the French Strategic Plan, some of them addressing all water-related issues. For instance, the environmental and climate commitment for water quality on arable land (70.06) includes a set of nine sub-measures with different levels of payment depending on the level of ambition chosen by the farmers. Some focus specifically on nutrient and fertilisation management, others on pesticide use and others on water abstraction. In some cases, results are expected some years after the start of the contract (e.g. in one case, water use has to be decreased by 15% by the third year). However, overall, the measure is likely to support a small area. It is also not clear from the Plan whether the most problematic areas will be targeted²⁰. Support for organic farming also provides multiple benefits, by prohibiting both pesticide and synthetic fertiliser use.

Other measures target specific aspects of water quality or quantity. This is the case, for instance, with one of the sub-measures in the flat-rate payment for the transition of practices (measure 70.27, see section 5.2). Under this sub-measure, farmers receive a payment if they reduce their pesticide Treatment Frequency Index²¹ by 30% over 5 years. While this result-based payment could have benefits in participating farms, it is likely that very few farms will take part as the budget is likely to be very small (an unknown portion of the 135 million euros dedicated for this intervention). The overall effect of such sub-measure is thus likely to be small. Moreover, the target set in the payment (-30% in the Treatment Frequency Index) is substantially lower than the targets defined in the European Farm to Fork Strategy (-50% of pesticide use by 2030) and in France's National Ecophyto II Plan (-50% of pesticide use in 2025 compared to 2015).

While a large number of measures focus on improving water quality and quantity, they cover a really small share of the agricultural area. Indeed, France plans to support commitments for water quality on only 5% of the UAA each year (result indicator R.21²²), for sustainable nutrient management on only 1.20% of the UAA

²⁰ In France in the 2023-2027 period, environmental and climate commitments (except for lump-sum ones ("MAEC forfaitaires")) will not be managed by regions, as in the previous CAP, but by the State. However, many implementation rules will be decided at regional level, by the regional directorates of the Ministry of Agriculture.

²¹ The Phytosanitary Treatment Frequency Index (TFI) is an indicator for monitoring the use of phytopharmaceutical products (pesticides) on a farm or group of farms. The TFI counts the number of reference doses used per hectare during a crop year.

²² Indicator R.21 includes the following interventions: Pillar II support for organic farming, two environmental and climate commitments on water quality (70.06 and 70.07), seven environmental

each year (R.22²³) and commitments for sustainable water use on only 1.20% of UAA each year (R.23²⁴)²⁵. Even with good targeting, measures targeting water quality and quantity therefore seem unlikely to deliver against the scale of the issue.

Table 4 below presents the interventions in France's Strategic Plan that are likely to contribute to water quality and availability, their main benefits and limitations, and whether they are mentioned in the Plan as contributing to specific objective (e) on resources.

Table 4: Potential impact of interventions on water quality and availability

Challenge	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
Nutrient surplus (water quality) Pesticides (water quality)	GAEC 4 buffer strips along watercourses	+: positive effect on nutrient leaching and run-off, GAEC goes beyond the EU requirements with 5m wide buffer strips (not 3m)	No
	Support for organic farming (30.01 and 70.01)	+: benefits for fertiliser use reduction, increased budget by 36% compared to the current CAP, relatively large area supported (11.71 % of the UAA in 2028, according to result indicator R.29 on organic farming, more than 3 times the area supported in the previous CAP) -: low level of support for maintenance compared to previous years (110€/ha vs. 160€/ha in 2015 for arable crops (IFOAM, 2016))	Yes
	Coupled income support for grain and fodder legumes (32.06 to 32.08)	+: fertiliser use reduction if used properly -: risks for biodiversity for some intensively cultivated crops (e.g.	Yes

and climate commitments in outermost regions (70.15-70.21) and the payment of commitments made in the previous CAP.

²³ Indicator R.22 includes the following interventions: environmental and climate commitments for water quality in arable land (70.06) and coupled support for grain and fodder legumes (32.06-32.08).

²⁴ Indicator R.22 includes the following interventions: two environmental and climate commitments on water quality (70.06 and 70.07).

²⁵ NB: these indicators only include the interventions mentioned in footnotes 23-25, not all the interventions included in Table 4.

		soybeans), risks in nitrates vulnerable areas (potential increased nitrates runoff and leaching depending on land management practices)	
	Sectoral interventions for fruits and vegetables, wine and olive oils (50.01a, 50.01a(bis), 50.01b, 50.01c, 50.01d, 50.01e, 50.01g, 58.03)	<p>+: finance for the development, of environmentally-friendly cultivation practices, e.g. limiting risk of diffuse pollution by fertilisers in the fruits and vegetables and wine sector, ringfencing for environmental and climate action in fruit and vegetable sector (15% of the budget)</p> <p>-: no indication on the share of the interventions' budget that targets environmental and climate action for wine and olive oil, can also support intensification</p>	Yes
	Environmental and climate commitment targeting fertiliser management (included in 70.06)	<p>+: some sub-measures include requirements on: forecasting nitrogen balance, limiting mineral nitrogen inputs, measuring nitrogen residues on the field, reviewing fertilisation management with a technician</p> <p>-: no information on the share of the intervention's budget (€233m) that will be allocated to these potentially beneficial measures. Potentially small budget</p>	Yes
	Aid for productive investments (73.01)	<p>+: funds investments in precision technologies that can reduce fertiliser use</p> <p>-: not clear how much of the budget will be targeting fertiliser use reduction (no env. and climate ringfencing)</p>	No
	Aid for non-productive investments (73.02)	<p>+: financing the development of purification buffer zones</p> <p>-: small budget (less than €35m in mainland France)</p>	Yes
	GAEC 4 buffer strips along watercourses	<p>+: vegetated buffer strips reduce pesticide leaching and run-off, GAEC goes beyond the EU requirements with 5m wide buffer strips (not 3m)</p>	No

GAEC 7 crop rotation	<p>+: support for pathogen management that could lead to pesticide use reductions</p> <p>-: use of derogation for the year 2023, exemptions of small farms (<10ha), farms with grassland, leguminous plants and fallow on more than 75% of their UAA and organic farms, crop rotation only mandatory on 35% of the land every year</p>	No
Eco-scheme, practices and landscape features pathways (30.01)	<p>+: crop diversity and interrow cover can help reduce pesticide use</p> <p>-: unlikely to lead to substantial pesticide reduction where it is used, crop diversity less effective than crop rotation for plant protection</p>	Yes
Support for organic farming (30.01 and 70.01)	<p>+: pesticide use reduction, increased Pillar II budget for conversion by 36% compared to the current CAP, relatively large area targeted (11.71 % of the UAA in 2028, according to result indicator R.29 on organic farming, more than 3 times the area supported in the previous CAP)</p>	Yes
Environmental and climate commitments targeting pesticide use reduction (included in 70.06 and 70.07 on water quality)	<p>+: sub-measures include requirements on: measuring the Treatment Frequency Index, limiting the frequency of treatment below a reference level (regional), both for herbicides and pesticides</p> <p>-: no information on the share of the interventions' budgets (together around €247m) that will be allocated to these potentially beneficial measures (not available in the Plan); Potentially small budget</p>	Yes
Environmental and climate commitment supporting the transition of practices (70.27) specifically the reduction of pesticide use	<p>+: result based payment. One sub-measure requires the reduction of the Treatment Frequency Index by 30%</p> <p>-: no information on the share of the intervention's budget that will be allocated to these potentially beneficial measures (not available in the Plan) but likely to be small and target few farmers</p>	Yes
Aid for non-productive investments (73.02)	<p>+: financing the development of purification buffer zones, investments to</p>	Yes

		optimise land under phytosanitary constraints -: small budget (less than €35m in mainland France)	
Water extraction (quantity)	Aid for productive investments (73.01)	+ : potential to improve water efficiency, water savings have to be higher than 5% and higher than 50% when the water bodies are in a less than good conservation status - : potentially leading to an increased area under irrigation, no incentive to change towards more adapted crops	Yes
	Environmental and climate commitments targeting water abstraction (70.06 and 70.07)	+ : sub-measures include requirements to decrease water use by 15% by the third year - : no information on the share of the interventions' budgets (around €247 m together) that will be allocated to these potentially beneficial measures (not available in the Plan). Potentially small budget	Yes
	Aid for agricultural water-supply infrastructures in the territories (73.07)	+ : support to modernise and develop water-supply infrastructures (e.g. reservoirs) capable of providing the water needed by farms, with the aim of making them more resilient; water savings have to be higher than 5%, and higher than 50% when the water bodies are in a less than good conservation status - : open reservoirs can have huge evapotranspiration losses, reducing the water available for soils	Yes

3.2 Soil quality

3.2.1 State of play in France and resulting needs

Soil quality refers to the soil's ability to provide ecosystem and social services, reflecting how well a soil performs its multiple functions (e.g. maintaining biodiversity and nutrient cycling) (Tóth, Stolbovoy and Montanarella, 2007). In Europe, soil quality faces several threats, including loss of soil organic matter (hereafter, SOM) and soil organic carbon (hereafter, SOC), erosion, contamination (pollution) and compaction (Stolte et al, 2015). All these issues can be observed in agricultural areas.

Soil organic matter refers to 'everything that is alive or was alive in the ground'. It is thus linked to soil biodiversity and SOC content. French soils store 4 billion tonnes of carbon in their first 30 cm (Pellerin et al, 2019). However, soil organic carbon and matter contents varies significantly depending on soil types, land use and land management practices. Permanent grasslands, for instance, are richer in carbon (between 80 and 90 t/ha) and have a higher microbial density (81 µg/g of soil) than arable land (around 60tC/ha in average and 38 µg of microbes per gram of soil in monocultures) (Commissariat général au développement, 2015). Hence, the conversion of grassland to arable land leads to a decrease in soil organic carbon and matter.

Soil functions are also threatened by erosion, contamination and compaction, which are all linked to some extent to agricultural practices. In France, almost 18% of soils have an average to very strong soil erosion risk (water and wind) (Gis Sol, n.d²⁶), with some areas being more vulnerable than others, in particular southern vineyards, arable land in the North and Southwest and parts of Brittany. Regarding soil contamination, researchers found that 50% of agricultural soils in France contain residues of at least two pesticides, and only 20% of are free from pesticide residues (Silva et al, 2019). Finally, the use of heavy machinery for crop production and trampling by livestock can lead to soil compaction, resulting in reduced water infiltration capacity and increased erosion risk.

To protect soils from degradation, France needs to conserve permanent grassland and foster sustainable farming practices that improve soil organic matter, prevent soil erosion and protect life underground (e.g. direct seeding). It also needs to support practices that reduce fertiliser and pesticide use (e.g. crop rotation).

3.2.2 Planned interventions

Some of the interventions analysed in the previous sections contribute to the improvement of soil quality. Interventions to promote carbon storage (and hence SOM and SOC) in soils are presented in section 2.2 and those to reduce chemical use and thus contamination are presented in section 3.1 on water quality. This section therefore focuses on interventions targeting other soil threats, such as soil erosion and compaction. They are presented in Table 5 below.

Several interventions and conditionality standards in the French Plan could provide benefits in terms of soil erosion and compaction. They include: several GAEC standards, the eco-scheme (through support for unploughed grassland, crop diversity, interrow cover, woody landscape features and hedgerows), aid for

²⁶ <https://www.gissol.fr/thematiques/erosion-des-sols-48>

investments and an environmental and climate commitment specifically targeting soil quality (intervention n°70.08). The latter promotes agricultural practices that limit soil erosion and compaction, including: direct seeding, non-productive areas and soil cover. Interestingly, it is partly result-based, as it requires farmers to provide estimates for an earthworm indicator in three different places, to do humic balance assessments²⁷ and to have a null humic balance after 5 years. However, this scheme has a small budget of around 5 million euros, approximately 0.04 % of PII funding. Consequently, the area targeted by this measure is likely to remain small, particularly in comparison to the area under average to very strong soil erosion hazard (around 27 million ha e.g., 18% of French soils) (Gis Sol). In addition, while non-productive investments aids could have a positive impact on soil quality (e.g. through soil remediation), productive investments could also lead to increased soil compaction if the type of equipment supported includes heavy machinery. The Plan does not mention any safeguards to limit this risk.

Overall, while soil quality benefits from several interventions aiming at carbon storage and protecting water quality, only one intervention (an environmental and climate commitment) focuses on soil quality beyond GAECs, and it has a small budget. There are other interventions that could potentially contribute to reducing soil erosion (e.g. the eco-scheme) but very few address soil compaction, which is also rarely mentioned in the Plan.

Table 5: Potential impact of interventions on soil quality

Challenge	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
Erosion	GAEC 4 buffer strips	+: can limit soil erosion along watershed	No
	GAEC 5 tillage management	+: potential benefits for waterlogged and steep slope soils that are subject to erosion -: only includes slopes of at least 10%, yet parcels with a substantially lower gradient can be at risk of soil erosion	No

²⁷ The humic balance is an input-output calculation that allows to check if the humus stock is consumed or if it is renewed. A null humic balance means that there is no loss of humus, and thus that soil carbon stocks are maintained.

	GAEC 6 soil cover	+ : potential benefits from soil cover on arable land - : soil cover only mandatory for a short period of time every year (2 months)	No
	Eco-scheme, practices pathway and landscape features pathway (30.01)	+ : support for grassland management (unploughed), crop diversity, interrow cover, woody landscape features and hedgerows - : low additionality (most farms will receive a payment without having to change their practices)	Yes
	Environmental and climate commitments targeting soil protection and quality (70.08)	+ : promotes agricultural practices that limit soil erosion, including direct seeding, non-productive areas and soil cover, result-based - : small budget allocated, and small area likely to be targeted, low uptake in past years	Yes
	Aid for non- productive investments (73.02)	+ : support for hedges, trees and agroforestry - : small budget for non-productive investments, not clear how much will benefit soil quality	Yes
	Aid for agricultural hydraulic infrastructures in the territories (73.07)	- : negative impacts of water reservoirs on soil moisture, potentially increasing soil erosion risk	No
Compaction	Environmental and climate commitments targeting soil protection and quality (70.08)	+ : promotes agricultural practices that avoid soil compaction, including direct seeding. - : small area likely to be targeted, small budget allocated, low uptake in past years	Yes
	Aid for productive investments (73.01)	+ : includes support for hedges and agroforestry - : Potential negative effect of support for investments in heavy machinery, no safeguards	Yes
Contamination	See interventions contributing to water quality in Table 7		
	Aid for non- productive investments (73.02)	+ : support for soil remediation - : small budget for non-productive investments, not clear how much will benefit soil quality	Yes

Loss of SOC/SOM	See interventions contributing to carbon storage in soils in arable land, grassland and permanent crops in Table 3
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4. CONTRIBUTION TO THE PROTECTION OF BIODIVERSITY

The following section focuses on the interventions contributing to both the protection of common farmland species and to protecting sensitive habitats and species.

4.1 Common farmland species

4.1.1 State of play in France and resulting needs

Common birds and butterflies are sensitive to environmental change and their population numbers can reflect changes in ecosystems as well as in other animal and plant populations (EEA, 2019b). Trends in common farmland bird and grassland butterfly populations can therefore be used as indicators of the health of agricultural ecosystems. In France, the farmland bird index decreased by 40% between 1995 and 2018, worse than the EU average trend but with important regional disparities (EC, 2020 a). There is no information on the grassland butterfly index at the national level, but the assessment of the conservation status of the fauna, flora and habitats of Community interest carried out in France on 44 insect species over the period 2013-2018, shows that 56% are in an unfavourable conservation status and that trends are negative in all kinds of ecosystems. Experts agree that the decline of insects is mainly due to the destruction or disturbance of their habitats, but also to the intensification of agriculture and forestry practices (Ministère de la transition écologique et solidaire, 2020a). Therefore, in order to protect biodiversity, France needs to extensify its farming systems to rely less on chemical inputs, for instance by supporting the conversion to organic farming or agricultural practices that reduce pesticide use (e.g. crop rotation and crop diversification) and to provide nesting and feeding habitats through the creation and maintenance of landscape features and other biodiversity-friendly habitats (e.g. hedgerows, fallow and wetlands). Furthermore, recent research shows that the configuration of agricultural landscapes (e.g. the size and shape of plots) impacts biodiversity. For example, small plots are more likely to host high levels of biodiversity and produce ecosystem services useful to farmers and society than large ones (Sirami and Midler, 2021).

4.1.2 Planned interventions

France includes a significant number of interventions in its Strategic Plan that aim to support the extensification of farming systems and sustainable agricultural practices that are beneficial to biodiversity, namely: eco-schemes, environmental and climate commitments, and investment aid. It also mentions changes to

conditions on coupled support and ANC payments as contributing to biodiversity protection.

However, the interventions targeting large areas and with the largest budgets are unlikely to have significant benefits for common species. Certain eco-scheme options (e.g. the “practices” Eco-scheme for arable land, see Box 1), coupled income support for livestock and payments for area of natural constraints are either unlikely to encourage farmers to radically change their practices, or to have a substantial positive impact on biodiversity because their requirements are not sufficiently stringent. For instance, coupled support for livestock may have the potential to support extensive grazing systems that might otherwise be abandoned, but it may also support other, more intensive, forms of farming with less biodiversity value. Coupled support for crops can maintain intensive cropping systems that do not provide biodiversity benefits. While payments for areas of natural constraints can help maintain and increase permanent grassland (Gallic and Marcus, 2019), they generally do not include specific environmentally-driven land management requirements that benefit biodiversity conservation (beyond compliance with conditionality) (Alliance Environnement, 2019).

Measures with more stringent requirements in terms of land management practices, and thus the ones that are the most likely to contribute to biodiversity protection, seem to target small areas and to be allocated less funding. For instance, the environmental and climate commitment for the transition of agricultural practices (70.27) includes a sub-measure requiring a 30% reduction in pesticide treatments. However, given the small budget for the intervention as a whole, it seems likely that only a small number of farms will participate.

The Plan also includes various supports for creating and maintaining landscape features, beyond the mandatory GAEC standard. For GAEC 8, France has not chosen the stricter implementation option. Indeed, it gives farmers the possibility to choose between two options (to have 4% of non-productive areas and features in their arable land, including land lying fallow or to have 7% of non-productive areas and features in their arable land but this time including catch crops or nitrogen-fixing crops²⁸), the second one being clearly less ambitious for biodiversity than the first one. Furthermore, France has increased the weighting factor for hedges in comparison to the previous CAP, making it easier to reach the requirement with less hedges. On the positive side, the timeframe during which it is forbidden to trim hedges has been extended.

²⁸ These catch crops and nitrogen-fixing crops have to be cultivated without the use of plant protection product.

The eco-scheme "landscape features" pathway offers farmers a standard level of payment (60 €/ha) if 7% of a farm's UAA is covered by agro-ecological infrastructures or fallow, or 80€/ha if these cover 10% of the UAA. However, the eco-scheme remains voluntary, and does not require farmers to go beyond the GAEC 8 requirement (of at least 4% of landscape features and fallow) on their *arable* land. Farmers can thus allocate their landscape features on other types of land, where biodiversity benefits could be lower. Furthermore, the eco-scheme does not require farmers to adopt specific management practices on these landscape elements in order to maximise biodiversity benefits (with the exception of fallow land where pesticides cannot be used). One environmental and climate commitment (intervention 70.14) aims to support the sustainable maintenance of these features, based on the establishment of an initial management plan, but it has a small budget (€35m, around 0.3% of the Pillar II budget) and is likely to target a small area.

Finally, France does plan any specific measures to increase the heterogeneity of agricultural landscapes, e.g. reconfiguring plot sizes and plot shapes in a way that would have positive impacts on biodiversity.

Table 6 below presents the interventions that are likely to contribute to the protection of common farmland species, their main benefits and limitations, and whether they are mentioned in the Plan as contributing to specific objective (f) on biodiversity.

Table 6: Potential impact of interventions on common farmland species

Need/beneficial practice	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
Extensive livestock/ High Nature Value farming	GAEC 1 on permanent grassland	+ : maintenance of grassland, triggering an authorisation system when more than 2% of permanent grassland is converted - : ploughing is allowed as well as the use of chemicals, thus reducing the potential benefits, ratio to be maintained at regional level rather than agricultural holding level, so more valuable grasslands can be lost in favour of less valuable ones elsewhere	No
	Eco-scheme, practices pathway (30.01)	+ : supports non-ploughed permanent grassland	Yes

		-: low additionality (most farms will receive a payment without having to change their practices)	
	Environmental and climate commitment targeting climate and feed autonomy (70.09)	+ : supports extensive and mixed crop livestock systems, with minimum share of grassland and pasture and a minimum of 90% of permanent grassland without pesticide use; third most funded environmental and climate commitment; one sub-measure also impose limits on fertilisation -: effectiveness will depend on the specifications chosen at the local level (max. livestock load, etc.); except for one sub-measure, no real safeguards against intensive grassland management practices	Yes
	Payment for areas of natural constraints (71.01-03)	+ : supports the maintenance of pastoral and grassland systems in some areas (e.g. Nouvelle Aquitaine) (Alliance Environment and Ricardo-AEA, 2018) -: not linked to specific practices that are good for biodiversity; no requirements for the management of grassland systems; likely to have a marginal (or null) impact (Alliance Environnement and Ricardo-AEA, 2018)	Yes
	Support for organic farming (30.01 eco-scheme and 70.01 conversion to organic farming)	+ : organic farming benefits biodiversity through chemical fertiliser and pesticides use reduction and increased diversity, increased budget by 36% compared to the current CAP, relatively large area supported -: low level of support for maintenance compared to previous years (110€/ha vs. 160€/ha in 2015 for arable crops (IFOAM, 2016); some management practices that are beneficial for biodiversity are not required by organic certification (e.g. the presence of landscape features, restrictions on ploughing)	Yes
Low input intensity systems	Eco-scheme, practices pathway (30.01)	+ : crop diversity and interrow cover can help reduce pesticide use -: unlikely to lead to substantial pesticide reduction where it is used,	Yes

		crop diversity less effective than crop rotation for plant protection	
	Environmental and climate commitment supporting the transition of practices (70.27) specifically for pesticide use reduction	+ : result based payment. One sub-measure requires the reduction of the Treatment Frequency Index by 30% - : no information on the share of the intervention's budget that will be allocated to these potentially beneficial measures (not available in the Plan) but likely to be small and target few farms	Yes
	Aid for productive investments (73.01)	+ : funds investments in precision technologies that can reduce fertiliser use - : not clear how much of the budget will be targeting fertiliser use reduction (no environment and climate ringfencing)	Yes
	Environmental and climate commitments targeting water quality (70.06 and 70.07)	+ : includes requirements aiming to reduce pesticides and fertiliser use - : multiple sub-measures with different level of effectiveness, no information on the share of the intervention's budget that will be allocated to the most beneficial measures (not available in the Plan)	No
	GAEC 8 on landscape features	+ : provides habitats for farmland species, extension of the timeframe during which it is forbidden to trim hedges compared to the previous CAP. - : use of derogation for the year 2023, various exemptions: small farms (<10ha) and other types of farms (with high level of grassland, leguminous plants and fallow); France did not chose the most ambitious implementation option (farmers can use a proportion of catch crops and nitrogen-fixing crops to comply), increased weighting coefficient for hedges compared to the previous CAP, making it easier to reach the requirement with less hedges	No
Landscape features	Eco-scheme, landscape features pathways and hedgerow bonus (30.01)	+ : supports biodiversity rich landscape features (inc. fallow) and hedgerows - : weak targeting for landscape features and fallow (minimum share of 7% at farm level, but possible to have only 4%	Yes

		on its arable land, where the biodiversity benefits would be highest)	
	Environmental and climate commitment on the sustainable maintenance of agro-ecological infrastructures (70.14)	+ : supports the sustainable maintenance of these infrastructures, establishment of an initial management plan, ban on phytosanitary treatments and fertilisation; as such, provides living, sheltering and breeding grounds for many animal and plant species - : relatively small budget (€35m, around 0.3% of PII budget) and likely to target a small area	Yes
	Aid for non-productive investments (73.02)	+ : funding the planting of hedges and trees - : small budget (less than €35m in mainland France)	Yes

4.2 Specific habitats and vulnerable species

4.2.1 State of play in France and resulting needs

In France, only a fifth of habitats and a quarter of species are in a favourable conservation status (INPN, 2019). There are however strong geographical disparities, with the poorest status occurring in the continental and Atlantic regions. The trends in conservation status also indicate a continuing decline for over a quarter of habitats and species, whilst only 8% of trends are improving. Some of the most degraded habitats are linked to agriculture, such as certain wetlands (low marshes, peat bogs) and agro-pastoral habitats (grasslands and meadows). Insect populations associated with these ecosystems are also particularly affected and show the highest declines (Ministère de la transition écologique et solidaire, 2020a). Some species are also particularly vulnerable to agricultural activities. The population of the European Turtle Dove for instance, one of the farmland bird species experiencing strong declines at European level, and of which France hosts 10% of the EU breeding population, fell by 44% in France between 1996 and 2016. The failure to protect this species has led to an ongoing EU infringement procedure against France²⁹. Therefore, France needs to implement specific measures to conserve and restore sensitive agricultural habitats such as wetlands and grasslands and to protect vulnerable species. The survival of other protected species, such as wolves, whose population range has been steadily expanding in France since 2000 (Commissariat général au

²⁹ https://ec.europa.eu/commission/presscorner/detail/EN/INF_20_2142

développement durable, 2018a), also requires specific measures to ensure their co-existence with pastoral activities.

4.2.2 Planned interventions

Table 7 below presents the interventions that are likely to contribute to the protection of specific habitats and species, their main benefits and limitations, and whether they are mentioned in the Plan as contributing to specific objective (f) on biodiversity.

The French Plan supports vulnerable habitats and species mainly through environmental and climate commitments. While these measures seem to be quite ambitious in terms of requirements, they generally target small areas and benefit from a small budget. Taken together, they account for around 500 million euros, corresponding to 3% of Pillar II funding. Some environmental and climate commitments and non-productive investment measures (e.g. aid for herd guarding) are also mentioned as contributing to the protection of large carnivores (e.g. wolves), because they help farmers protect their livestock, thus favouring the co-existence of wolves and pastoral activities. Finally, the Plan does not yet include payments for areas with specific disadvantages linked to the EU nature directives (i.e. Natura 2000 compensation payments) or to the Water Framework Directive. Such measures could support the conservation of wetland and grassland and they will be introduced in a later version of the Plan.

Overall, the French Strategic Plan promotes the protection of biodiversity mainly through the support of general sustainable practices (organic farming, extensive livestock and crop systems), while very few interventions actually target specific habitats such as wetlands and/or grasslands and the protection of specific species. Where they do exist, they have small budgets and target small areas³⁰. A closer analysis of these target schemes' effectiveness against specific needs would be necessary to assess whether they are sufficient despite the small budget and area.

³⁰ This does not necessarily mean that these interventions will not address the needs for the protection of sensitive habitats and species. Indeed, the area that needs to be supported might be small and well targeted by the interventions.

Table 7: Potential impact of interventions on protected habitats and species

Beneficial practices	Standard or intervention (number)	Potential benefits and limitations	Linked to the climate objective in the Plan?
Sensitive habitats (grassland and wetland)	GAEC 9 on permanent grassland in Natura 2000 areas	+ : ban on conversion and on ploughing of sensitive grassland (EU regulation) - : only includes sensitive grassland, defined as pastoral areas and grassland with high biodiversity value that are located in Natura 2000 areas	No
	Environmental and climate commitment for the preservation of the agro-ecological balance and biodiversity of specific environments (70.10)	+ : targets specific environments e.g. salt marshes, wetlands, grassland and pasture area; requires the use of a management plan, various requirements on livestock loads, land cover, maintenance of mowing and pasture, limits on fertilisation, ban on pesticides; the sub-measure for grassland is partly result-based (requiring the presence of plants that indicate agro-ecological balance and the absence of degradation of the grass cover); substantial budget (around 335 million euros, 2.5% of PII funding) - : numerous options available with different levels of effectiveness	Yes
	Environmental and climate commitment on maintenance of biodiversity by opening up environments and fire control – 70.13	+ : support the maintenance of open habitats where favourable to biodiversity, in particular by mowing or mechanical work. Imposes a ban on pesticides and chemical fertiliser use and the use of a management plan; - : small area likely to be targeted, small budget (around €10m, less than 0.1% of PII funding)	Yes
Species	Environmental and climate commitment for the creation of cover of interest for biodiversity, in particular pollinators (70.11)	+ : supports the creation of grassland and land cover of faunistic and floristic interest favourable to pollinators; ban on the use of plant protection products and mineral fertilisers, restrictions on grassland ploughing and heavy work	Yes

		-: small area likely to be targeted and small budget (around 72 million euros, 0.5% of Pillar II funding)	
	Environmental and climate commitment for the improvement the preservation of species (70.12)	+ : supports farmers delaying the use or setting aside (grassland) areas on which plant and animal species depend to complete their reproductive cycles; ban on the use of plant protection products and mineral fertilisers, implementation of a specific management plan based on a farm diagnosis -: small area likely to be targeted and small budget (around 60 million euros, 0.4 % of PII funding)	Yes
	Environmental and climate commitment for the improvement of the pollinator potential of (domestic) bees (70.28)	+ : mentioned in the Plan as contributing to biodiversity protection by supporting beehive location that takes into account the presence of wild pollinators -: no benefit for wild pollinators, no safeguards for avoiding potential negative impacts on wild pollinators	Yes
	Environmental and climate commitment for herd protection against predation and herd guarding (70.26 and 70.31)	+ : supports the co-existence of large carnivores and extensive livestock systems in pastoral areas	Yes

5. CROSS-CUTTING INTERVENTIONS AND INNOVATION

This section reviews both the cross-cutting interventions in the French Plan that can contribute to environmental and climate action, and hence are additional to those reviewed in sections 1 to 4. It also takes a look at innovative approaches in the Plan, both in terms of innovative types of schemes and in terms of technological innovation, in order to assess the extent to which France is supporting or testing new and appropriate solutions to the challenges faced.

5.1 Cross-cutting interventions

The cross-cutting interventions in the CAP, such as support for knowledge exchange and dissemination, advisory services and cooperation can contribute to environmental and climate action. Knowledge exchange and dissemination, as well as advisory services, can improve farmers' knowledge on the linkages between climate change, resources and ecosystem protection and agriculture. They can also allow them to learn the necessary skills to change their farming systems, adopt more sustainable practices and improve their farm's resilience to climate stressors.

Cooperation measures, particularly the ones supporting the European Partnership for Innovation (EIP), can drive research on environmental and climate questions which in turn can improve the knowledge base and capacity to deliver (Alliance Environnement and Ricardo-AEA, 2018). In the French Plan, the total budget for EIP interventions is 76 million euros and this can fund projects relating to sustainability, however there is no information on what share will go to these, or which criteria will be used to assess projects as this is decided regionally (see Table 8). A look at EIP projects funded in the last CAP shows that they have supported improvements in sustainability, including: innovative practices for soil management, climate adaptation or low-input cropping systems without irrigation (see box 2 below).

Box 2: Examples of French EIP projects funded under the previous CAP

- Innovative soil management practices adapted to vegetable systems in Normandy to limit the effects of erosion and compaction

This EIP project aimed at identifying, developing and sharing innovative management practices that could limit soil compaction and erosion (EIP-

AGRI, 2022b). The practices aim to: 1) manage soil organic matter by adapting doses and frequency of inputs and monitoring changes in soil, 2) adjust tillage by adapting tools, limiting the number of times the machinery passes over the field, and assessing the short, medium and long term effects of the use of new practices, and 3) maximise soil cover with different varieties and analyse the expected long term effects of the integration of intercrops in the rotation on soil quality.

- Demonstrating actions to mitigate the carbon footprint of beef production in Nouvelle Aquitaine

In Nouvelle Aquitaine, this EIP project aimed to promote innovative farming systems and methods to reduce the carbon footprint of beef production (EIP-AGRI, 2022a). In practice, the carbon footprint of 600 average farms and 100 pilot farms with low carbon impact were evaluated. The project focused on: 1) testing and promoting innovative best practices to reduce GHG emissions and increase carbon sequestration on beef farms, 2) designing, testing and disseminating innovative approaches to advisory services in order to better integrate environmental issues into advice to farmers, and 3) structuring, building and promoting a collective and shared action plan on carbon in beef farms.

- Innovative arable crop systems with legumes

This project was located in the Languedoc region where the soil has a low production potential due to past intensive agricultural practices (EIP-AGRI, 2022c). It aims to improve resilience to drought, excess water, and economic challenges, by testing innovative cropping systems which include legumes, use low amounts of inputs and do not rely on irrigation, to measure: (a) their technical feasibility, (b) the inputs of fuel, fertilisers and phytosanitary products required, and (c) their techno-economic performance (e.g. potential gains and losses in terms of mechanisation and labour). Two experimental fields were set up to evaluate the agronomic impact of: 1) drought in a rotation system with chickpeas; and 2) water excess on a sowing system with permanent legume cover. These are used as demonstration sites for farmers.

Member States have some flexibility as to whether they choose to use cross-cutting interventions for climate and environmental action. The CAP Regulation specifies that knowledge sharing should, to some extent, target nature,

environment and climate protection. However, it does not impose clear rules on how Member States should implement this in their Strategic Plans. For instance, there is no minimum share of these measures' budget that should go to climate and environmental action.

5.1.1 Planned interventions

France has three cross-cutting interventions that could contribute to environmental and climate action: support for EIP operational groups, support for other forms of cooperation and training and advice (see Table 8). However, the Plan does not provide a clear indication of the proportion of these that are environment or climate related. These measures also have small budget allocations, from 0.57% of the Pillar II budget for EIP groups to 1.03% of the Pillar II budget for training and advice and the Plan does not set a target for the number of recipients benefitting from cross-cutting interventions related to environmental or climate-related performance (result indicator R.28). Importantly, all farmers applying for environmental and climate commitments must undergo specific training (as well as carry out an agro-ecological assessment of their farm and participate in exchange meetings with other farmers). This could help to increase the uptake of these interventions, which was relatively low in France under the previous CAP (European Commission, 2019)³¹. Yet, it remains unclear to what extent the budget dedicated to knowledge exchange and dissemination and advisory services will be sufficient to provide support to all the farmers engaged in environmental and climate commitments.

Table 8: Cross-cutting interventions with potential benefits for climate and environmental objectives

Type of interventions	Interventions	Potential benefits and limitations
Cooperation	Support for operational groups of the EIP (77.01)	+: supports EIP groups with a focus on sustainability in agriculture, amongst others -: not clear what share of supported projects are linked to environmental and climate objectives; no safeguards for environmental sustainability imposed on projects aiming to increase productivity; no earmarking of the budget for environmental and climate objectives; no information on the selection criteria used to choose the projects (they are defined at the regional level)

³¹ In 2021, it had 6% of its UAA supported by environmental and climate commitments vs. 13% in average in the EU.

	Support for other forms of cooperation (77.06)	<p>+: supports projects related to the re-territorialisation of food (development of territorial food strategies, farmers' collective projects for food supply) and to the climatic and environmental transition of agriculture (development of agroforestry and hedgerows, quantitative water management, development of farmers' groups committed to the transition, development of pastoralism, circular economy, etc.)</p> <p>-: not clear what share of supported projects are linked to environmental and climate objectives; no earmarking of the budget for environmental and climate objectives; no information on the selection criteria used to choose the projects (they are defined at the regional level)</p>
Knowledge exchange	Access to training, advice, dissemination and exchange of knowledge and information (78.01)	<p>+: includes training on technical and economic skills, including adaptation to environmental change, advice which favours a global vision of the farm</p> <p>-: no detailed explanation on the kind of training and advice that will be provided and the contribution to environmental and climate action; no earmarking of the budget for environmental and climate objectives; few farmers targeted, small overall budget</p>

5.2 Innovative approaches in the French Strategic Plan

Beyond the EIP interventions, the Strategic Plan supports other innovative forms of environmental and climate action. These are innovative either by design (for instance result-based payments or collective approaches), because they support the use of new technologies on-farm or for monitoring, or because they include new requirements that are relevant for environmental and climate action. This section presents some of the innovative interventions identified in the French Strategic Plan.

5.2.1 Result-based payments

Result-based payments in their purest form, make funding conditional on the achievement of pre-defined results. Instead of paying farmers for implementing practices on a certain area of land, they have to demonstrate that they have improved or achieved better environmental or climate results. The French Strategic Plan supports at least three payments based on environmental or climate results.

The new flat-rate payment for the transition of practices (70.27) is a result-based payment with potential positive impacts on both climate and soil and water. This

measure aims to support farms' ecological transition and is based on a personalised and progressive approach, assessing the results achieved at the end of the period compared to an initial diagnosis. Farmers can choose between three themes: pesticides, GHG emissions or feed autonomy. In concrete terms, they have to either reduce their Treatment Frequency Index by at least 30% (thus limiting water and soil contamination), reduce their GHG emissions by 15% or improve their protein autonomy by reaching targets defined for 4 practices³². The total budget for this measure amounts to approximately 135 million euros, corresponding to 1% of Pillar II.

The environmental and climate commitment for soil quality (70.08) is a result-based scheme introduced in the previous CAP period which requires farmers to assess the humic balance on their farm and to have a null balance after 5 years (i.e. to maintain carbon in soils). It encourages farmers to implement agricultural practices limiting soil degradation such as direct seeding or permanent land cover. Farmers also need to provide estimates for an earthworm indicator in three different places. The scheme has a budget of around 5 million euros over the whole period, corresponding to 0.04% of Pillar II.

The environmental and climate commitment for the preservation of the agro-ecological balance and biodiversity of specific environments (70.10) incentivises farmers to adopt practices beneficial to flora and fauna in six specific habitats, such as rice terraces, salt marshes and grasslands. It already existed in the previous CAP. Two of the sub-measures targeting grassland and pastoral areas are result-based payments. They require specific land management practices (e.g. maintenance of mowing and pasture), as well as the compliance with several indicators on the areas under agreement, including, in some cases, the presence of plants that indicate agro-ecological balance. The total budget this intervention for the entire period amounts to more than 335 million euros (i.e 2.5% of Pillar II). However, it is not clear how much of this budget will be dedicated to the result-based payments.

The environmental and climate commitment 70.06 aims to improve water quality and quantity. It encourages the adoption of practices that reduce nitrate and phytosanitary pollution and promote good water quantity management. In total, there are nine main measures divided into 24 sub-measures for different types of systems and with different levels of ambition and remuneration. Two of these sub-measures are result-based, requiring farmers to reduce the volume of water

³² These are: an increase in the share of UAA under protein fodder, improvement in livestock farming practices, increased on-farm production of feed concentrates and reduced dependence on imported proteins.

consumed for irrigation by 15% by the third year, compared to the five years preceding the commitment. However, the Plan does not indicate which area will be targeted under these sub-measures. In total, the intervention's budget amounts to 1.7% of Pillar II.

5.2.2 Collective approaches

Collective approaches can be understood as actions taken by a group of farmers (and stakeholders) who jointly apply to participate in an environmental and climate commitment or an eco-schemes, therefore providing higher levels of environmental public goods and ecosystem services through landscape-level implementation. They are used, for instance, in the Netherlands and Ireland. However, no such intervention is funded in the French Plan.

5.2.3 New technologies

Some technical innovations, such precision farming technologies involving tools such as sensors or drones, can help farmers improve the sustainability of their farming systems, for instance through reductions in chemical inputs. In the French Plan, investment measures provide funding opportunities for the acquisition of equipment, including precision farming tools aiming at limiting GHG emissions and pollution. However, they do not require farmers to reach a specific GHG emissions or input reduction target or to report their reductions. Whilst being positive for efficiency, the overall impact of such technologies, for example on biodiversity and soil, does depend on how they are deployed and combined with other practices (such as crop rotation, biodiversity friendly management and features).

5.2.4 New requirements

Among the schemes introduced in this CAP, France has brought in a Pillar II commitment targeting livestock farms, to improve sustainability and reduce herd sizes. The intervention for climate, animal welfare and feed autonomy (70.09) contributes to climate change mitigation and animal welfare improvements, by limiting the number of animals in relation to the surface area of the farm, by encouraging outdoor access for animals and by improving fodder autonomy on the farm. It is the third most funded environmental and climate commitment of Pillar II, with a budget of 257 million euros. Two options are available, one targeting ruminants (e.g. cows and sheep) and another one targeting monogastric animals (e.g. pigs and chickens)—the only intervention of the Plan targeting the latter. Among other things, it conditions the payment to various thresholds which will be set at regional level, for instance for ruminants: a maximum livestock load, a minimum share of grassland and pasture in the UAA,

a maximum maize silage area and a maximum level of feed concentrate purchase. The effectiveness of the measure will therefore depend on the thresholds chosen at the local level.

6. CONCLUSIONS

Overall, the French Strategic Plan appears insufficient to trigger the shift in farming systems and practices needed to respond to the scale and urgency of the climate and biodiversity crisis. There is a mismatch between the needs identified and the proposed interventions. The bulk of France's CAP support continues to go to basic income support payments, which are not sufficiently conditioned on sustainable practices. There is also significant funding going to coupled support, investment aid and risk management, without sufficient safeguards to ensure this supports sustainable farms or practices. France has on the whole not used the flexibility available to significantly improve requirements and funding for the environment and climate.

Nevertheless, the Plan contains some improvements compared to the previous CAP. In some cases, this is in line with the European regulation, for example France has opted for the minimum ringfencing for eco-schemes in Pillar I, although it does not appear that these will trigger significant changes in practices, especially for arable farms. In other cases France goes beyond what is required in the EU regulation, for example with the requirement for all CAP beneficiaries to have 5 rather than 3 metre buffer strips along water courses. Another significant improvement is the increase in funding for conversion to organic farming. There are a number of promising schemes in Pillar II, including innovative result-based payments, however in general they have a small budget or target small areas, and may suffer from low uptake.

In many cases mentioned in the report, important decisions will be taken at the regional level, such as on thresholds within environment and climate commitments. Therefore, it will be important to follow these in order to get a more precise picture of the impacts of these interventions.

Member States CAP Strategic Plans can be amended once per year, and a mid-term review is scheduled for 2026. The next CAP will come into force after 2027, with discussions already beginning. We therefore propose two sets of recommendations: 1) amendments to the French Plan in the current period, and 2) wider recommendations for the CAP and EU agri-food policy as a whole:

Recommendations for amending the French Plan:

- Address gaps in the in the intervention logic (between needs identified and the proposed interventions), in particular concerning GHG emissions, climate adaptation and soil quality.

- Strengthen GAEC requirements, in particular for GAEC 7 (stop exemptions for maize seed production and increase the area subject to crop rotation in each farm) and GAEC 8 (e.g. 10% of landscape features and fallow instead of 4% following Pe'er et al (2021)), evaluate the impact of the derogations granted to farmers in 2023 for these two GAEC standards.
- Review the eco-scheme to either remove the least effective options or strengthen their requirements (in particular the "practices" pathway in arable land), review the levels of payment of the eco-scheme so that it better reflect the cost incurred or the value of public goods provided (while still complying with WTO rules), and strengthen its requirements in the coming years to foster an ongoing change in practices.
- Address the low uptake of environmental and climate commitments by increasing the level of payment, monitoring uptake, analysing the barriers to the involvement for farmers and strengthening support for training and advice for farmers involved in those commitments.
- Include collective approaches that could be beneficial for the preservation of natural resources and biodiversity and increase the budget for innovative approaches (e.g. result-based payments) and accompanying training and advice.
- Progressively increase the budgets for eco-schemes, environmental and climate commitments, non-productive investments and cross-cutting measures, with a corresponding decrease in basic income support and coupled support. This recommendation could also be implemented at the EU-level.
- Fund additional studies and research to evaluate the potential impacts of the Strategic Plan and its interventions on environmental and climate action. This recommendation could also be implemented at the EU-level.
- Strengthen the requirements and safeguards on potentially harmful measures such as coupled support for livestock (e.g. with lower ceilings and maximum livestock loads), risk management tools (e.g. making payments for insurance premiums conditional on crop diversification criteria), and irrigation investments (e.g. making it conditional on choosing water-saving crops). This recommendation could also be implemented at the EU-level.

Wider recommendations

- Biodiversity- and climate-proof CAP Strategic Plans and their interventions. This means considering trade-offs between environmental and climate

objectives, including additional safeguards (e.g. for biodiversity when supporting legume production), and identifying and promoting win-win strategies.

- Introduce environmental and climate ring-fencing for cross-cutting measures, all sectoral interventions and productive investments in the next EU regulation, to ensure a minimal share of the budget will be spend on projects contributing to these objectives.
- Increase action to reduce the agriculture sector's GHG emissions and carbon removals in the 2023 revision of Member States' National energy and climate plans (NECPs, due by 30 June 2023), and amend the CAP Strategic Plan accordingly.
- Improve transparency, including by publishing a complete version of all CAP Plans, providing the output targets and budgets for all interventions.
- Accompany changes in the production systems by changes in other parts of the food systems, for instance by developing a food systems strategy that includes targets for meat and dairy consumption, or by applying sustainability standards to imported goods. This would limit the risk of carbon leakage to non-EU countries.

To summarise, while the new CAP structure provides more flexibility to Member States with the aim to increase EU's ambitions in terms of sustainability, our analysis of the French Strategic Plan suggests that France did not take the opportunity offered to significantly increase its support for environmental and climate action. The new delivery model which introduced the CAP strategic planning process, has been positive in terms of encouraging Member States to adopt an "intervention logic approach", but does not appear to have resulted in significant changes to interventions and budgets. In some cases, as for example for the budgets allocated to basic income support and coupled aids, the evolution in France has even been in the wrong direction, authorising Member States to increase their support, despite the fact that these aids support the status quo and can indirectly support harmful forms of farming. The revision of the interventions and budgets proposed in the EU Regulation therefore appears necessary for the next CAP.

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ANNEX

Budgets of the interventions related to environmental and climate objectives

N°	Title	Pillar	Planned budget (in million euros, whole period)	Planned budget (% of the Pillar, whole period, total public expenditure)
31.01	Eco-scheme	P1	8,420.5	25 %
32.04	Coupled support for cattle	P1	3,277.2	9.7 %
32.06+32.07 +32.08	Coupled support for legumes	P1	976.8	2.9 %
70.01	Support for conversion to organic farming – Mainland France	P2	1,434.0	10.6 %
70.02	Aid for conversion to organic farming - "Payment of annual instalments for commitments entered into in accordance with the 2014-2020 RDPs"	P2	220.0	1.6 %
70.06	Environmental and climate commitment - Quality and quantitative water management for field crops	P2	232.9	1.7 %
70.07	Environmental and climate commitment - Quality and quantitative water management for perennial crops	P2	13.7	0.1 %
70.08	Environmental and climate commitment - Soil quality and protection	P2	5.10	0.05 %
70.09	Environmental and climate commitment - Climate, animal welfare and food autonomy of livestock farms	P2	256.9	2.5 %

70.10	Environmental and climate commitment - Preservation of the agro-ecological balance and biodiversity of specific environments	P2	335.8	3.3 %
70.11	Environmental and climate commitment - Creation of cover crops of interest for biodiversity, in particular pollinators	P2	71.9	0.7 %
70.12	Environmental and climate commitment - Preservation of species	P2	59.0	0.5 %
70.13	Environmental and climate commitment - Maintenance of biodiversity by opening up environments and fire control - DFCI	P2	10.3	0.1 %
70.14	Environmental and climate commitment - Sustainable maintenance of agro-ecological infrastructures	P2	37.7	0.3 %
70.26	Environmental and climate commitment - Protection of herds against predation	P2	Not available in the published version of the plan	
70.27	Environmental and climate commitment - flat-rate "Transition of practices	P2	135.3	1.3 %
70.29	Management commitment - API	P2	53.5	0.5 %
70.30	Environmental and climate commitment - Protection of endangered breeds	P2	29.0	0.2 %
70.31	Aid for herd guarding in pastoral territories outside predation zones	P2	8.8	0.09 %

70.32	Payment of the annual instalments of the 5-year commitments entered into under the RDPs (to be completed)	P2	27.0	0.2 %
73.01	On-farm productive investments: support to primary agricultural production and to projects carried out by farmers or their projects led by farmers or their groups	P2	1,730.6	12.8 %
73.02	Non-productive agricultural investments	P2	34.5	0.2 %
76.01	Payment for insurance premiums	P2	Not available in the published version of the plan	
76.02	Mutual funds	P2	Not available in the published version of the plan	
77.01	EIP	P2	76.3	0.5 %
77.06	Other cooperation projects meeting CAP objectives	P2	97.6	0.7 %
78.01	Access to training, advice; dissemination and exchange of knowledge and information	P2	138.5	1.03 %



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