



MAKING THE COMMON AGRICULTURAL POLICY A LEVER OF THE AGRO-ECOLOGICAL TRANSITION

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FOREWORD

The proposals presented by France Stratégie do not reflect the official position of the government. They constitute a basis for reflection aimed at informing debates and public action at national and European level. Their overall consistency does not preclude consideration of a phased and progressive implementation of the proposed tools according to the importance of the technical and regulatory changes to be made.

This work was supported by a group of experts co-chaired by Jean-Christophe Bureau and Pierre Dupraz and composed of Charlotte Emlinger, Samuel Féret, Alexandre Gohin, Hervé Guyomard, Sébastien Jean and Jean-Luc Pujol (see Annex 1). This group of experts shared the diagnosis of the limits of the current common agricultural policy but was unable to reach a consensus on the instruments to be implemented to develop this European policy. Gilles Bazin, Sophie Devienne and Aurélie Trouvé participated in several meetings of the working group but did not wish to endorse the report.



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SYNTHESIS

The Common Agricultural Policy (CAP), launched in 1962, is founded on three principles enshrined in Treaties still in force:

- Building a single market in which agricultural products circulate freely;
- Giving priority to European agricultural production by border protection;
- Applying financial solidarity among Member States by establishing a common budget.

This European policy initially lacked an environmental dimension. Since its creation, however, this policy has undergone many changes reflecting the internationalization of trade and the emergence of new societal concerns. These developments have created a technical complexity limiting the readability of the CAP for its beneficiaries, and more broadly, for European citizens.

Today, the European budget used by the CAP represents 55 billion euros a year, or 43% of the total budget of the European Union (EU). France is the main beneficiary, receiving about €9 billion of European funding a year or 16% of the CAP budget-- a share equivalent to its contribution to the total EU budget¹.

On average, these agricultural subsidies constitute 100% of the current pre-tax income of French farmers. These subsidies, therefore, clearly enhance the profitability of farms. And since they are independent of current turnover, they also play an important role as an economic buffer if a production shock or price shock occurs for certain productions.

The CAP has increased Europe's food production, and ensured relative food self-sufficiency. Economically, it has also enabled Europe to improve its agri-food trade

¹ In 2016, France contributed €22.5 billion to the EU's total budget, or 16% of the total EU budget. See "[The European budget and France](#)" on the Budget Directorate's "Performance Forum" portal (last updated on 6 March 2018).

balance, particularly by increasing the value of exports of transformed¹products. Yet, the CAP has provoked a great deal of criticism. Most of these critiques have addressed its excessive complexity, or its inability to redirect agricultural systems towards production methods less harmful to the environment. Such criticisms have also stressed the CAP's failure to meet societal expectations for food supply, or to guarantee an adequate income for farmers, especially during crises.

In ¹ June 2018, the European Commission presented its budgetary proposals together with recommendations for possible orientations of the future CAP. These proposals would encompass a multi-annual budget of €365 billion that represents a 5% decrease in the European budget for agriculture in current euros compared with the current period, once Brexit is taken into account. The thematic guidelines give high priority to subsidiarity. This is reflected in the definition of strategic plans within each Member State that provides a national framework for the allocation of financial allocations. Such a context offers, additionally, an opportunity to evaluate the reforms in France as part of a national plan, or more broadly, at a European level, in both the medium or long term. Here, the aim is to develop a common agricultural policy that meets societal expectations more reliably, more effectively by limiting risks and hazards for agricultural companies.

The figures mentioned in this report are based on the assumption of an unchanged budgetary framework.

The foundations of a more sustainable and efficient CAP

Given the current unsatisfactory situation, and the future CAP as proposed by the Commission, the development of a national strategic plan could be an opportunity to implement an effective, simplified agricultural policy. This policy should meet several objectives:

- To develop sustainable agricultural systems to reduce the consumption of natural resources by agriculture, decrease the negative impact of agri-culture on the environment, and increase its positive effects;

¹ European Commission (2018), « [Agri-food trade in 2017: Another record year for EU agri-food trade](#) », *MAP 2018-1*.

- To ensure a decent standard of living for the agricultural population, in particular by increasing the individual income of those working in agriculture;
- To meet societal expectations for food and health concerns with food and agricultural practices;
- To anticipate crises and reduce fluctuations in turnover and operating income;
- To improve the added value of the agri-food sectors.

These objectives must be pursued while lessening administrative complexity.

To achieve these aims, the proposed approach is based on a few simple principles:

- Bringing the CAP closer to the principles of public economy:
 - by implementing environmental taxation based on the polluter pays principle (and its mirror, the subsidized supplier);
 - by using public money to finance public goods and the positive externalities of agriculture;
 - by intervening for transparent and fair market functioning, avoiding the establishment and maintenance of dominant positions for inputs, marketing, processing and services, including agricultural insurance, and by removing regulations that create situation rents.
- Establish conditions to ensure that farms are more resilient to risks, and develop a solid ability to overcome them. One way to achieve this goal is to promote the diversification of production, as well as the autonomy of farms to improve shock absorption capacities.
- Implement modes and types of production that contribute to improving the nutritional and health quality of food supply, including limiting the use of inputs that can impact human health and effect environmental quality throughout the food chain.
- Support agricultural and agri-food innovation, and the dissemination of such innovation, especially through independent advisory structures.

Three main implementation rules must also be integrated:

- limit the use of instruments based on quantities, quotas, and agronomic requirements that may prove costly, because of threshold effects, and be difficult to administer and control¹;
- base the instruments implemented on indicators according to variables easy to observe, or those already routinely recorded, to limit the administrative and transaction costs incurred by farmers²;
- systematize the conditionality of aid based on observed results, established by indicators, using available information technologies.

A coherent set of instruments based on the principles of public economy

This report proposes subsidies and taxes proportional to observable, verifiable indicators better correlated with expected environmental impacts, which can be combined in the form of bonus-malus. The aim is to move away from aid coupled with market production and aid based on minimum thresholds of practice, with derogations. Taxation has the advantage of discouraging practices harmful to health and to the environment, while providing means to fund beneficial practices more generously. The taxes levied would be completely redistributed to farmers in a scheme aimed to encourage environmentally good practices and discourage bad ones. A system of reimbursement (malus) of public expenditure invested in the construction of public goods in case of destruction would make it possible to secure their maintenance, because these public goods have been financed by current payments. Such is the case of aid paid to maintain permanent grasslands, a practice that benefits biodiversity and carbon sequestration, and that should be repaid if a reversal occurs. The introduction of Europe-wide taxes would require a unanimous decision by all Council members, which by definition is difficult to achieve. The initial implementation of national bonus-malus schemes would still constitute a major step

¹ For example, introducing control measures on some parcels and not on the whole farm are very difficult to control. See McCann L. and Easter K. W. (1999), "Transaction costs of policies to reduce agricultural phosphorous pollution in the Minnesota River", *Land economics*, vol. 75(3), pp. 402-414; Mettepenningen E., Beckmann V. and Eggers J. (2011), "Public transaction costs of agri-environmental schemes and their determinants - Analysing stakeholders' involvement and perceptions", *Ecological Economics*, vol. 70(4), pp. 641-650.

² McCann L. (2013), « Transaction costs and environmental policy design », *Ecological Economics*, vol. 88, p. 253-262 ; Abler D. (2004), « Multifunctionality, agricultural policy, and environmental policy », *Agricultural and Resource Economics Review*, vol. 33(1), p. 8-17.

forward, with all malus products to be paid to farms in transition to agro-ecological practices, thus limiting the potentially negative effects of these schemes on farm competitiveness.

Some farmers, by their location, have a special responsibility towards the environment---the preservation of biodiversity in Natura 2000 areas, and the protection of catchment. Since their actions only make sense as part of a coherent territorial project, involving a sufficient number of agricultural holdings, it is necessary to take these specificities into account.

In addition, the report proposes to change the structure for the payment of aid at the national level from “[area aid](#)” to aid for agricultural workers, whether employed or not, which would favor “job-rich” farms. Finally, support for innovation and investment would be reserved preferentially for farmers who engage in experimentation and ecological transition.

The different measures and instruments we propose would make it possible to support and develop production methods that offer ensured environmental and health benefits, as well as affording means to accelerate, systematically, the agro-ecological transition of agricultural holdings, thereby meeting societal expectations for healthy and sustainable food.

The proposed reform could put certain farms particularly those considering as - polluting or others benefiting from coupled support in financial difficulty if it were applied without a transitional phase. Taxes and penalties should be introduced gradually to allow farmers time to adapt, with rates increasing over time according to a known trajectory.

Instruments for biodiversity and climate

To preserve biodiversity and combat global warming, the report proposes the following measures:

- A bonus for the diversification of production, whether it is crop rotation or herds.
- A bonus-malus for permanent grasslands. This system should include a bonus for permanent grasslands associated with a minimum loading condition¹, and the presence of animals with benefits for maintaining biodiversity. To avoid the

¹ Loading corresponds to the quantity of animals raised per unit area. It is measured in Large Cattle Units (LU) per hectare, with a bovine animal over two years old corresponding to one LU, and a small ruminant (sheep or goat) equivalent to 0.15 LU.

current¹threshold effects, this bonus should be based on a payment to grasslands increasing with age up to a certain limit, that is, increasing for ten years and stable thereafter. It would necessarily be associated with a malus should a grassland rollover occur.

- A bonus-malus for areas of ecological interest (EIS)²: this bonus would be based on the areas registered in the current CAP, which limits the risk of destruction of the EIS currently in place, and would also be associated with a malus in the event of destruction.
- Taxes on pesticides and persistent veterinary drugs in the environment, including antibiotics.
- A tax on greenhouse gas emissions from the agricultural sector that represents about 20% of the ³country's total emissions. It could be calculated from livestock sizes and nitrogen applications.
- The gradual abolition of the exemption from the domestic consumption tax on energy products.

A bonus for Natura 2000 areas and high natural value areas of the Green and Blue Screen

Aid would be provided for a consortia of farms those ensuring territorial continuity of actions on ecological networks, and committing themselves jointly to maintain or improve Natura 2000 areas or agricultural areas of high natural value. Directing financial support to farms in continuity would limit the risks of dispersal currently observed on certain schemes. The payment would be calculated by quantified area commitments, and as far as possible, environmental impact indicators, notably the abundance of species in the target area.

¹ Only grasslands more than five years old are counted as permanent, which may encourage the return of grasslands before they reach this age, so that they are not subject to preservation obligations.

² Hedges, wooded strips, tree lines, pollard trees, ponds, low walls, ditches, fallows, mixed crops, etc. See Ministry of Agriculture and Food (2015), "[Towards the CAP 2015 →2020 : Les surfaces d'intérêt écologique](#)", April.

³ Carbon equivalent air emissions, excluding land use, land-use change and forestry (LULUCF), in 2016 (see [CITEPA](#)).

A long contract for agro-ecological innovation (CIAE)

Signed between farmers' groups and public authorities, this contract would integrate the goals, and take up one of the tools of the European Agricultural Innovation Partnership (EIP-AGRI), the operational groups. It would thus support innovation and training dedicated to the local agro-ecological transition in favor of local public goods: improvement of water quality from the reduced use of fertilizers and pesticides. This contract would focus on financing the costs of the agro-ecological transition, specifically those related to the conversion to organic farming or other types of agro-ecological specifications--- High Environmental Value (HVE), yet focused on training costs; development of distribution networks; risk protection during the first years of the transition; and obtaining official quality marks. This contract could further support the diversification of production and sources of income. It would be defined for a sufficiently long period to ensure a transition from production methods to sustainability (seven years).

A basic payment based on the number of annual work units

The purpose of this aid is to ensure that all farmers receive a minimum payment, distinct from the level of agricultural production, to cope more efficiently with crises and price volatility. Agro-ecological practices can produce a higher workload than conventional practices --for instance, the mechanical weeding in place of pesticide use-- and hence require a larger workforce. This aid would also support sectors rich in employment, notably market gardening and livestock. It would be paid to the farmer requesting CAP aid, subject to compliance with current environmental practices as part of the "green payment".

The current allocation for first pillar¹ support would allow the basic payment per annual work unit ²(AWU). With a total amount of €5.7 billion in 2018, and 711,000 full-time equivalents (FTEs) --farmers and employees-- in 2016³ (structural survey), annual aid of approximately €8,000/FTE/year is feasible, compared with an average of €135 per hectare today for basic payment entitlements in metropolitan France.

¹ Either direct support measures for markets and agricultural incomes.

² According to INSEE, this is "the unit of measurement of the quantity of human labour provided on each agricultural holding". The AWU is equivalent to the work of one person working full time for one year.

³ Ministry of Agriculture and Food (2018), "[Agricultural Statistics - Edition 2018](#)", *Agreste Mémento*, December.

The financing of this reform

The total budget of the proposed CAP would be composed of the current CAP budget in addition to the amounts collected through taxes and penalties.

The various taxes proposed, the quantification of which involves a number of assumptions that must be examined in greater detail could generate between €4 billion and €11 billion in the long term, depending on the rates adopted (see table below). In the low hypothesis, the malus would represent 20% of the price for fertilizers and antibiotics, and 15% of the cost for antibiotics.

Estimated revenue per tax

Type of tax	Values of the selected rates	Source for the rates used	Total amount collected by the tax
Fertilizers and soil improvers	0.2 to 0.7 € per euro purchased	European experiences	700 to €2,450 million
Pesticides and agrochemicals	0.15 to 1 € per euro purchased	European experiences and targeted reduction levels	495 to €3,300 million
Antibiotics	0.2 to 0.7 € per euro purchased	Scientific article ¹	150 to €525 million
GHG	30 to 56 €/t CO _{2e}	French carbon tax path (LTECV*)	2690 to €4939m

* Act No. 2015-992 of 17 August 2015 on the energy transition for green growth.

Source: France Stratégie

Estimates of the total budget required to pay the premiums, depending on the assumptions made, range from €4 billion to €9.1 billion (see table below).

Estimate of the envelopes required for the three environmental bonuses

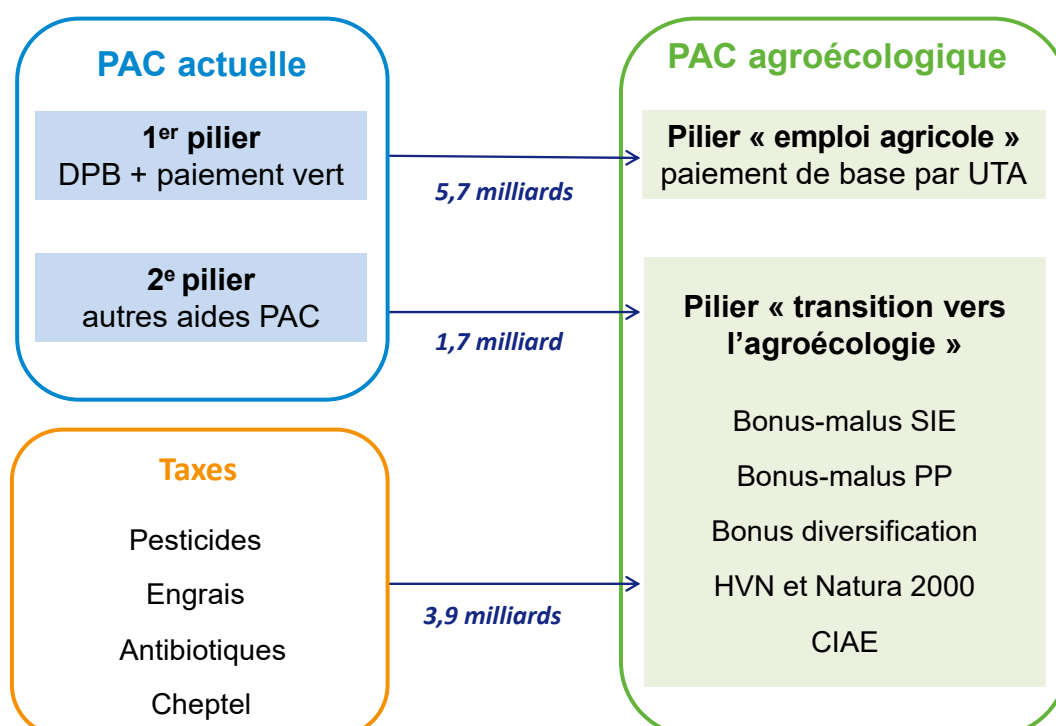
Bonus	Surfaces concerned (in thousands of hectares)	Amount of the premium (€/ha)		Total budget (€bn)	
		Minimal	Maximum	Minimal	Maximum
Permanent meadows	7 702	200	457	1,5	3,5

¹ Van Boeckel T.P., Glennon E.E., Chen D., Gilbert M., Robinson T.P., Grenfell B.T., Levin S.A., Bonhoeffer S. and Laxminarayan R. (2017), "[Reducing antimicrobial use in food animals](#)", *Science*, vol. 357(6358), p. 1350-1352.

Crop diversification	18 263	130	303	2,4	5,5
Areas of ecological interest	515	200	200	0,1	0,1

Source: France Stratégie

Thus, the amount of taxes collected could cover the amount of premiums distributed, in addition to the basic payment per agricultural work unit without requiring an increase in the current CAP budget.



The differentiated impact on farms

The standard case study makes it possible to identify the major trends in the redistribution of aid within the agricultural sector. This report uses characteristic data taken from "typical" farms and provided by the *INOSYS-Réseaux d'élevage* collective platform set up on French territory by the chambers of agriculture and the *Institut de l'élevage*. This simulation illustrates that organic and grassland systems would be "winners", and could maintain their current practices. Diversification, however, would be necessary for conventional arable crops farms that under unchanged practices could possibly lose up to 46% of their aid in the most adverse scenario (typical case of a 300-hectare farm). Adjustments would also be necessary for livestock farms; those with permanent grassland are favored over more intensive farms that could

lose under unchanged practices as much as 40% of their aid in the worst cases corresponding to an intensive dairy workshop.

This reform would redirect CAP funds towards production systems that theoretically offer the most environmental amenities, and contribute to maintaining agricultural employment, since the agro-ecological transition is founded on the implementation of more labour-intensive techniques:

- the bonus-malus on crop diversification would benefit farms that are already diversified, usually organic and polyculture-poly livestock farms, to the detriment of field crop farms;
- the bonus-malus on permanent grasslands would support extensive farming;
- taxes on pesticides and fertilizers would benefit agro-ecological and organic farms;
- the tax on greenhouse gas emissions would influence livestock, above all ruminants;
- bonuses for Natura 2000 and high nature value areas would benefit in particular extensive livestock farming, particularly in mountain areas;
- finally, the payment of a basic payment per work unit would make it possible to consolidate labour-intensive production, most notably fruit, wine and vegetable farms, as well as agro-ecological farms.

The implementation of this reform would not entail a radical overhaul of the European regulatory corpus for most proposals. Yet the introduction of a basic payment per agricultural work unit may require a review of the rules for the distribution of aid between Member States together with a thorough legal analysis. As indicated *above*, these measures should be applied gradually by defining increasing rates of bonuses and maluses, according to a previously defined trajectory, to give farmers the time to develop their production systems.



INTRODUCTION

The Common Agricultural Policy (CAP) has played a key role in European integration. Indeed, it was one of the very first policies implemented in all Member States after the creation of the European Economic Community, and has long accounted for most of Europe's budget. By guiding production methods and structuring the agri-food sectors, it has helped to maintain Europe's position as one of the world's major agricultural producers. Yet at the same time the CAP policy has failed to ensure a decent standard of living for a large number of farmers, and the sector as a whole is witnessing a steady decline in workers. Moreover, it has been unsuccessful in reducing the frequency of crises in the sector, nor has it diminished the environmental impact of agriculture. Complex in its structure, in its implementation and control, the CAP has provoked some misunderstandings, and at times has been rejected by a growing proportion of the agricultural profession. What is more, by inadequately directing agriculture towards a more resilient model-- one adapted to environmental challenges and societal expectations of food supply-- it has prompted frequent demands for reassessment by a part of civil society, as documented by the conclusions of the recent public consultation on the modernization and simplification of the future CAP¹.

While the discussions on the "post-2020" CAP are taking place, it is essential to rethink the framework of this emblematic European policy to meet the expectations of citizens as well as participants in the agri-food sector. How can the CAP be simplified, and at the same time the effectiveness of its various instruments be increased? How can the CAP be used as a means to redirect agriculture towards more sustainable practices, thus responding to the challenges of climate change, biodiversity erosion, and resource conservation? How can the number and effects of the crises on agricultural and agri-food actors be limited? And how can a decent and stable standard of living be guaranteed for farmers?

¹ See the public consultation "[Modernising and simplifying the Common Agricultural Policy - Highlights](#)", European Commission.

The principles of public economics can provide some answers to these questions. Their implementation would make it possible to propose a coherent set of tools applicable to all European agricultural holdings. These elements could stimulate future debates at both the European and national levels.



CHAPTER 1

THE CAP, THE FIRST COMMON POLICY IN EUROPE

At the end of the Second World War, when Europe labored to feed its population, the founding members of the European Economic Community adopted a centralized common policy to increase the productivity of the agricultural sector, improve farmers' incomes, and ensure the supply of European consumers. Thus, the common agricultural policy was enshrined at the very heart of the Treaty of Rome in 1957.

The first CAP was implemented in 1962 and was based on three founding principles:

- build a single market in which agricultural products circulate freely, without customs duties, to converge agricultural prices, wages, and regulations to create a common market.
- give priority to European agricultural production with border protection, and thus implement concretely a form of European preference.
- implement financial solidarity with Member States that contribute to a common budget according to their wealth.

The CAP has undergone many changes in parallel with the internationalization of trade, and the emergence of new societal concerns, especially those dealing with the preservation of the environment. These developments have created a technical complexity, limiting the readability of this policy for its beneficiaries and, more broadly, for European citizens.

1. A constantly changing policy

1.1. 1962-1992: from the search for self-sufficiency to the control of overproduction

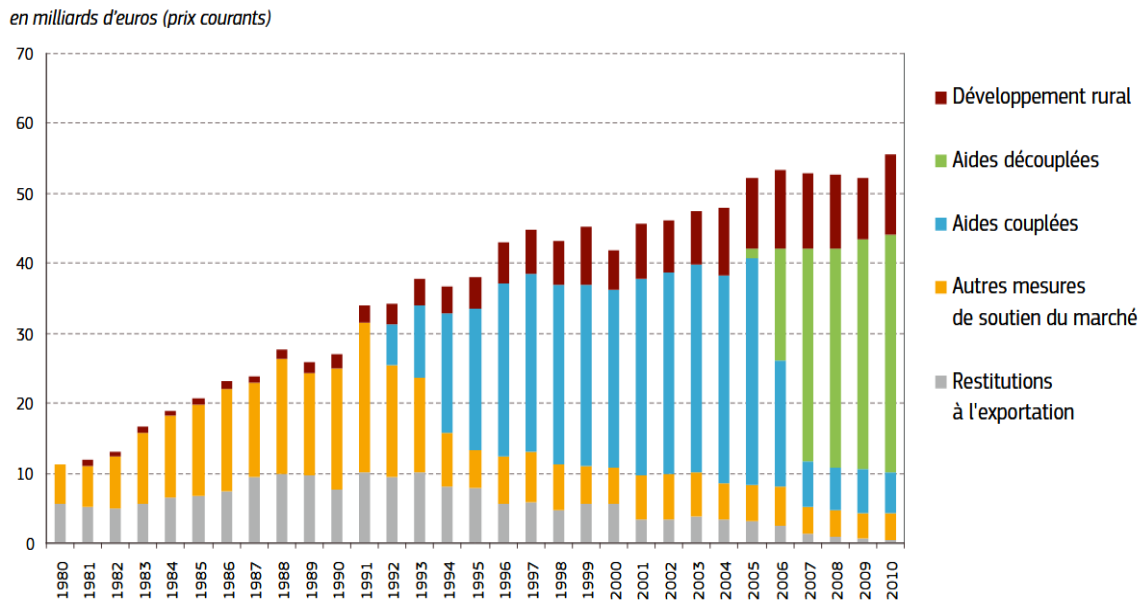
The first CAP was based on common market organisations (CMOs), a set of instruments guiding production, stabilizing prices and supply of agricultural products by a minimum producer buy-back price called the "intervention price". Variable customs duties guaranteed Community preference; the difference between the European guide price and the world price was financed by European consumers. The scheme was supplemented by export subsidies. When world prices fell below the intervention price, the Community authorities bought agricultural production at this guaranteed price. Then they sold it once prices rose, stored it (cereals), processed it (butter or powdered milk), or even destroyed it (fruit and vegetables). In practice, the implementation of this policy was based on the European Agricultural Guidance and Guarantee Fund (EAGGF); the "guarantee" part financed public purchases supporting prices, storage or export subsidies and represented almost 90% of the fund to the detriment of the "guidance" part, devoted to product innovation and promotion. In 1969, the CAP budget constituted almost 80% of the total budget of the European Economic Community. Then, assured of always selling at a guaranteed price, European farmers were encouraged to produce more, to modernize, and to expand. Farmers' areas, yields, and incomes increased: the primary objectives of the CAP were achieved.

As early as the 1970s, however, supply exceeded demand for many products. This meant limiting excess production by increasing the pressure on the CAP budget. Various instruments have been established to control supply such as grubbing-up premiums for vines. The most radical reform involved the limitation of milk supply, with the introduction of milk quotas in 1984. Despite these efforts, Europe has increasingly resorted to storage, expensive as it is. Such a shift was also explained by technological progress that reduced production costs, and supported overproduction, a measure that necessitated increased storage. Thus, in 1991, European cereal stocks amounted to 25 million tons, those of beef to 900 000 tons... The CAP budget, amounting to approximately 21 billion current euros in 1985, has continued to increase, exceeding 33 billion euros in 1991, or 57%¹ of the total European budget, which itself represents only about 1% of the European Union's

¹ European Commission (2012), *The Common Agricultural Policy. A story to follow*, Luxembourg: Publications Office of the European Union.

GDP (see Graph 1). At that time, export refunds amounted to 10 billion current euros and market support schemes to more than 21 billion.

Graph 1 - Evolution of CAP expenditure from 1980 to 2010 and distribution of aid



Source: European Commission, 2012

In addition, exports on the world market are at a price well below the European price, because of export refunds that lowered the world price of products, and angered third countries. Refunds made it possible to compensate for the difference between the prices of agricultural products in Europe and world prices by subsidizing the export of certain agricultural products to third countries. The latter accused Europe of protectionism, considering that they were subject to unfair competition and deprived of access to the Community market. Their action, within the framework of the GATT (*General Agreement on Tariffs and Trade*) agreements, has led to a complete overhaul of the CAP.

1.2. 1992-2003: the creation of direct aids and the second pillar

In 1992, European Commissioner Ray MacSharry implemented a major reform. Aiming to bring domestic prices closer to world prices, and reduce public incentives for overproduction, the guaranteed prices for European farmers fell sharply-- by about 35% for cereals and 15% for beef. In compensation, an aid was paid directly to the producer, depending on his area, and a reference yield introduced. This aid, linked to the choice of production, though not to yields, represented 5.6 billion euros out of a

total budget of about 34 billion euros in 1992. The amount of this direct aid increased steadily until 2003 to reach 29 billion current euros, partly because of the constant decrease in intervention prices, and partly because of the successive enlargements of the European Union, and inflation. In addition, the introduction of set-aside--the compulsory set-aside of a percentage of land that could be reviewed from one year to the next-- helped to contain the supply of arable crops in the short term. CAP expenditure was now better controlled and international negotiations could resume (the Marrakech agreements were signed in 1994, at the conclusion of the *Uruguay Round*).

In 1999, to prevent production surpluses linked to the planned enlargement of the Union to include Eastern European countries, the EU continued to reduce guaranteed prices, partly balancing this practice by an increase in direct aid. These reforms have not ended an agricultural development model based on the expansion and productive specialization of farms, in which mechanization and intensive use of industrial inputs have replaced labor, as well as the productive specialization of regions. The negative effects of these developments on the environment, most of all on water quality and biodiversity, have continued to worsen.

It was at this time that the idea of a second pillar of the CAP dedicated to rural development emerged as part of the *Agenda 2000* reform to complement the first pillar consisting of aid paid to producers according to agricultural area and a reference yield. This second pillar brought together a set of pre-existing measures, co-financed by the Member States and the European Union. The aid was intended to contribute to investment, spatial planning, landscape maintenance, or environmental protection, and can be subscribed to by farmers voluntarily. Among these aids, agri-environmental measures (AEM) offered compensation for the extra costs, and losses of income associated with farmers' implementation of certain practices to improve the state of the environment by a multiannual contract. In 2003, this budget for rural development amounted to around €8 billion, with the total CAP budget at that time being around €47.5 billion.

2003-2013: decoupling aid from production levels

In 2003, direct aids were further decoupled from the choice of production with the introduction of the single payment right (SFP), paid to farmers according to historical references regardless of what they produced. This reform was part of the World Trade Organisation (WTO) Doha Round of negotiations. Since 2007, decoupled aid represented nearly €30 billion out of a total CAP budget of €55 billion. France chose to calculate this aid by an individual reference: the aid received by French farmers

then depended on the aid they received in 2000, 2001 and 2002, and therefore, on the distribution of their production at that time. The SFPs were paid in return for compliance with standards for environmental, public health, and animal welfare, a practice known as "conditionality," implemented from 2005 onwards. Unlike the direct aids of the 1992 reform, the SPS no longer guided production choices. The choice of individual references benefited cereal growers, whose references were historically the strongest. However, each Member State has retained certain coupled aids such as the premium for [maintaining suckler cows](#) (PMTVA) in France.

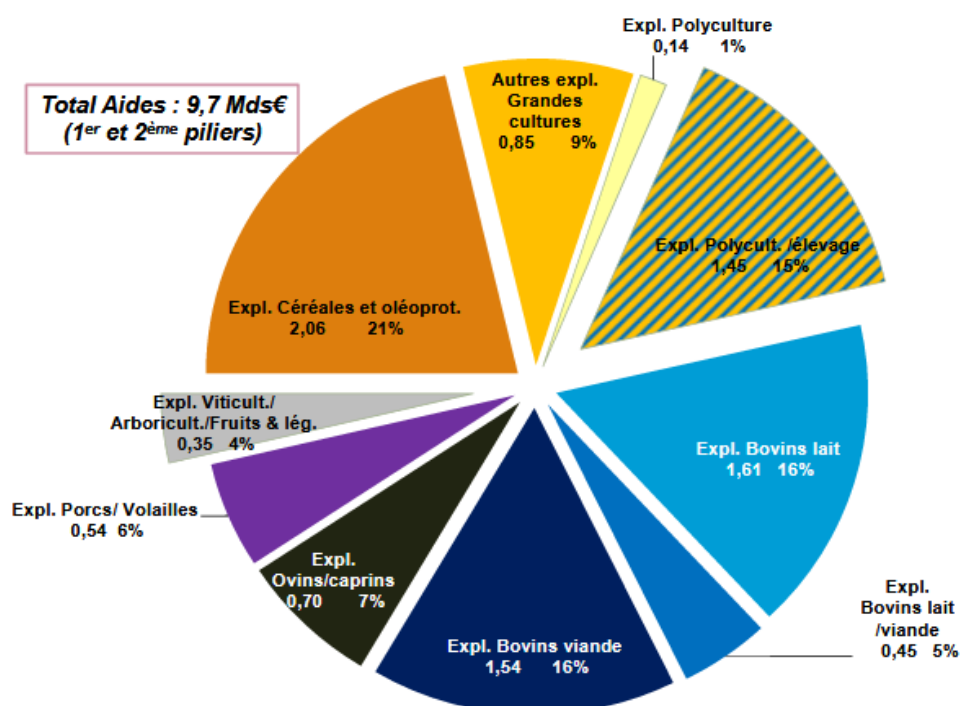
In 2008, the reform aimed to take into account the enlargement of the European Union, and to meet an increasing demand - or at least expected as such - for agricultural products on world markets. Compulsory set-aside was then abolished and the abolition of milk quotas ratified in 2015. At the same time, the second pillar of the CAP was strengthened with the increased consideration of new challenges such as climate change, and the development of renewable energies. This reform also increased the autonomy of Member States in the choice of certain CAP instruments and levers further distancing it from the original centralizing principles of the 1962 CAP.

Box 1 - Aid varies greatly according to the type of farm

The CAP monitoring and forecasting unit (CAPEye) in¹ Montpellier Sup Agro showed that in 2011, 21% of the aid under the first and second pillars of the CAP was distributed to cereal and protein-producing farms compared with 37% to beef farms (milk, meat or mixed) and 15% to polyculture and livestock farms (see Figure 2).

On average, French farms received €31,000 in aid in 2011 (see Figure 3). Meat, mixed and mixed and mixed livestock and mixed-crop livestock holdings received between €45,000 and €50,000 in aid, compared with €40,000 for cereal and protein crop holdings, €34,000 for dairy holdings and €22,000 for pig or poultry holdings.

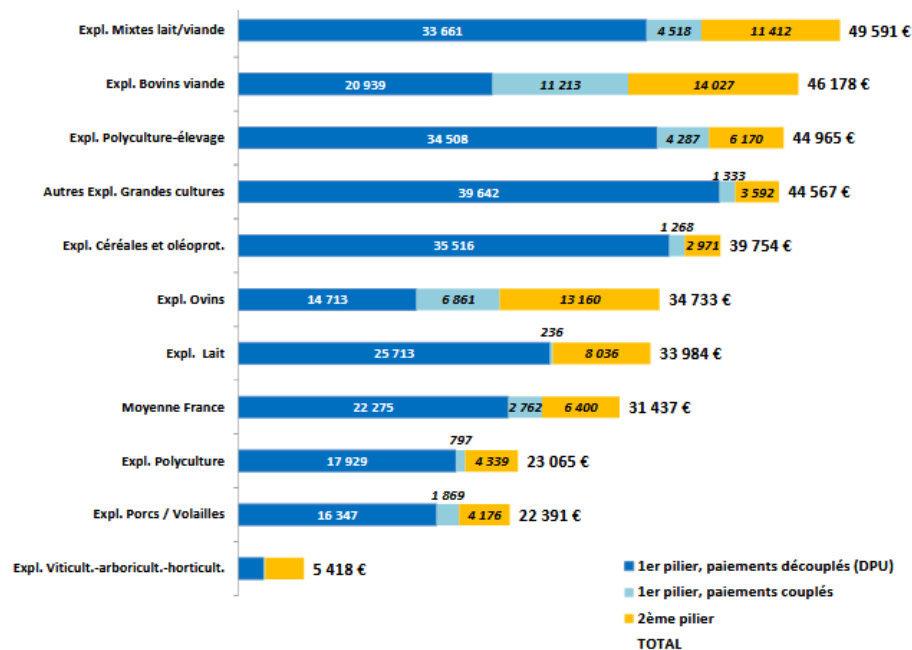
Graph 2 - Overall distribution of CAP first and second pillar support by OTEX in 2011



Source: Ministry of Agriculture - Agreste - RICA 2011, based on CAPEye, 2014

¹ "Aides de la PAC en 2011 en France par OTEX (orientations technico-économiques des exploitations)", study by AGPB (Association générale des producteurs de blé de la FNSEA), 2013.

Graph 3 - Average levels of first and second pillar support of the CAP paid by OTEX in 2011



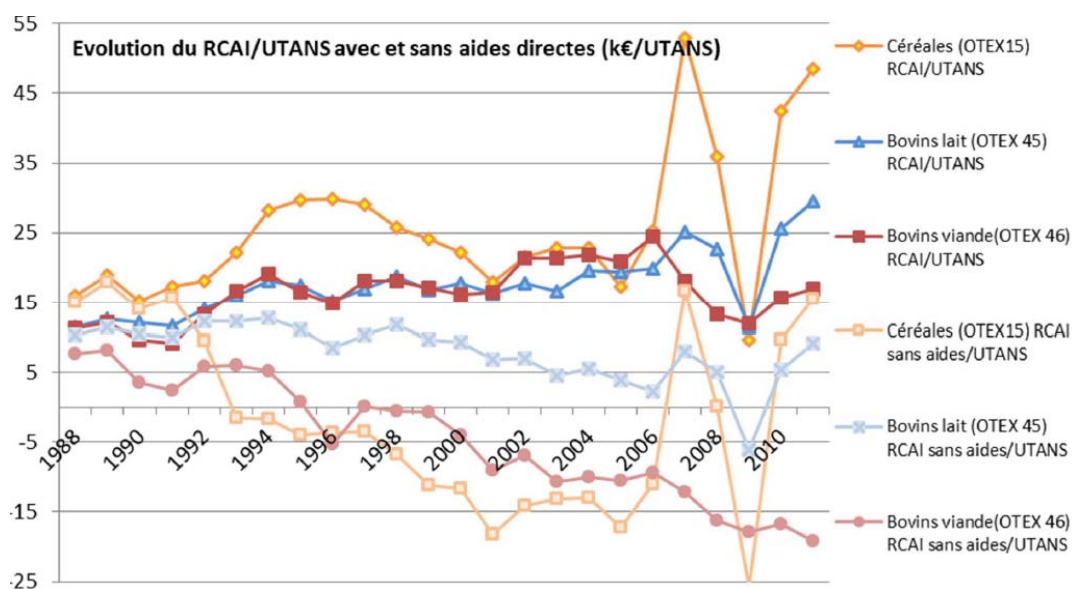
Source: Ministry of Agriculture - Agreste - RICA 2011, based on CAPEye, 2014, cited by V. Chatelier (INRA)

The distribution of CAP aid is highly variable according to the types of agricultural holdings as measured by statistical categorization into OTEX (technical and economic guidelines for holdings), and the share of this aid in farmers' incomes. Thus, as Alessandra Kirsch showed in 2017¹, some OTEXs are extremely dependent on subsidies. Without the aid, a large number of farms would have had negative income since 1992 (see Figure 4).

The farms with the largest share of CAP aid in current pre-tax income (RCAI) are specialized in beef cattle. For these, direct aids have represented between 200% and 250% of the RCAI since 2007. Still, it is the cereal and oilseed farms that received the most direct aid per annual self-employed work unit from 2007 to 2011, regardless of income level.

¹ Kirsch A. (2017), "Common Agricultural Policy, Direct Aid to Agriculture and Environment: Analysis in France, Germany and the United Kingdom", thesis for the degree of Doctor of the University of Burgundy-Franche-Comté, defended on 30 March 2017.

Graph 4 - Evolution of current income before taxes (RCAI) per annual non-salaried work unit (UTANS) of agricultural holdings according to their technical and economic orientation and the payment of CAP subsidies from 1988 to 2011



Source: Kirsch, 2017

2014-2020: a strengthened environmental ambition

The 2014 CAP reform ended the single payment entitlements (SPS) that were largely replaced by basic payment entitlements (BPS). To make the CAP more equitable, PBOs are paid for all eligible hectares of useful agricultural land, and have a per hectare amount that must gradually converge between and within Member States by 2019. Aid is now more focused on the active farmer than before, yet it remains conditional on compliance with regulatory requirements under European directives (cross compliance), as well as on good agricultural and environmental conditions chosen by each Member State. In addition, the payment of 30% of first pillar aid is subject to compliance with a set of environmentally beneficial practices¹: the "green payment". Organic farming is believed to satisfy the green payment, while small farms, representing about 30% of the agricultural area used, are exempt from it.

These include, in particular:

¹ These practices contribute to the sequestration of carbon in soils and the preservation of biodiversity.

- to contribute to maintaining, at regional level, a ratio of so-called permanent grassland, over five years old, to the useful agricultural area of the region, and not to return certain permanent grassland, known as "sensitive";
- to have a diversity of crop rotation, that is, to have at least three crops on arable land;
- to have "areas of ecological interest" (EIS) on its farm-- to preserve landscape features (trees, hedges, buffer strips, certain types of crops, etc.) corresponding to at least 5% of the arable land area and EIS.

For the other components of the first pillar, the main aspects of market management to have survived twenty years of reform are the intervention in the form of "safety nets". These now involve private storage aid and, if necessary, public procurement. For the second pillar, the main development in France was based on the transfer of its management to the Regional Councils, establishing Regional Rural Development Programmes (RDPPs), validated by the Commission.

The French CAP budget included approximately €9 billion of European funds every year for the period 2014-2020, with €1.4 billion for the second pillar. The year 2018 is a special case: the total amount of public assistance executed amounted to €11 billion because of the catching-up of payments from previous years. During this period, the DPBs represent approximately €4 billion paid each year compared with €2 billion for the green payment. The compensation for natural disability amounts to €1 billion (see Table 1). The European budget dedicated to the CAP represents about €55 billion a year, or 43% of the EU's total budget. France is the largest European recipient of agricultural aid reaching 16% of the annual European budget allocated to the CAP, a figure equivalent to France's contribution to the Union's budget¹.

¹ In 2016, France contributed €22.5 billion to the total EU budget, or 16% of its total budget; see "[Le budget européen de la France](#)".

Table 1 - Main public support implemented by the CAP in million euros from 2014 to 2018 according to the projected agricultural accounts¹

		2015	2016	2017	2018*
First pillar	Allocations for basic payments (DPB)	3 077	3 075	2 961	3 605
	Green payment	1 870	2 067	2 007	2 145
	Coupled aids	1 211	1 149	1 147	1 334
	Sub-total	7 646	7 959	7 585	9 079
Second pillar	Natural handicap compensation (ICHN)	828	972	893	1 217
	DFAIT	238	205	227	390
	Sub-total	1 729	1 415	1 498	2 199
Total Total		9 375	9 374	9 083	1 1278

* The year 2018 corresponds to a year of catching-up in the payment of first and second pillar aid.

Source: France Stratégie, based on the provisional accounts for agriculture (MAA-SSP, 2019)

The data from the 2019 Farm Accountancy Data Network gives an idea of the distribution of CAP subsidies between the different types of agricultural holdings (see Table 2). Thus, in the sample studied, public aid constitutes on average about 100% of current pre-tax income. This proportion, however, varies widely, from less than 10% for winegrowing and market gardening farms to more than 200% for beef, mixed and small ruminants (sheep and goats).

These results underscore the importance of CAP support in the pre-tax current income of cereal and protein crop producers and ruminant farmers.

¹ Lubatti G., Casset-Hervio H. and Reynaud D. (2017), "[Les comptes prévisionnels de l'agriculture pour 2017 - La production se redresse](#)", *Insee Première*, n° 1680, December.

**Table 2 - Share of CAP subsidies in pre-tax current income (RCAI)
per annual non-salaried work unit (UTANS) within the various technical and economic guidelines:
example of farms in the 2019 FADN sample**

	All exploits	Plant production					Animal production						Polyculture-livestock farming	
		Cereals and protein crops	Other field crops	Arboriculture	Market gardening	Viticulture	Meat cattle	Mixed cattle	Sheep and goats	Milk cattle	Pigs	Poultry		
Number of farms in the sample	7 282	921	577	356	241	1 130	714	222	436	1 018	205	285	819	
1st pillar aid paid	Decoupled aid (k€)	20,08	29,27	30,91	6,57	2,26	2,35	22,27	28,17	18,93	22,52	14,83	9,20	27,51
	Coupled aid (k€)	3,74	1,27	1,37	1,45	0,24	0,10	11,77	9,20	10,43	3,27	0,93	1,29	5,40
2nd pillar aid paid	Aid for rural development (k€)	4,41	0,89	0,80	1,94	0,43	0,49	11,40	10,62	15,63	7,04	1,17	0,97	4,32
	<i>of which ICHN (k€)</i>	3,37	0,35	0,21	0,76	0,08	0,14	9,27	8,78	13,99	5,53	0,77	0,47	3,07
	<i>including MAEC and bio (k€)</i>	1,03	0,54	0,50	1,12	0,35	0,35	2,12	1,85	1,61	1,51	0,40	0,50	1,24
Total CAP aid (k€)	28,23	31,43	33,08	9,96	2,93	2,94	45,44	47,99	44,99	32,83	16,93	11,46	37,23	
RCAI (k€) / UTANS	27,37	19,25	38,15	32,87	33,59	39,62	17,74	23,67	20,68	26,94	49,54	34,92	21,56	
Share of CAP aid in comparison to RCAI/UTANS	103 %	163 %	87 %	30 %	9 %	7 %	256 %	203 %	218 %	122 %	34 %	33 %	173 %	

Source: France Stratégie, based on the provisional accounts for agriculture (MAA-SSP, 2019)

2. A mixed record

The CAP has increased Europe's food production and ensured its relative food self-sufficiency. Economically, it has also enabled Europe to develop a positive agri-food trade balance above all by increasing the value of exports of transformed¹ products. Yet, as implemented today, the CAP is the subject of much criticism, whether from its complexity, its inability to redirect agricultural systems towards less environmentally damaging production methods, or its failure to guarantee a decent income for farmers, especially in times of crisis.

One of the principal criticisms of the CAP is the excessive amount of the budget allocated to first pillar support compared with the budget accorded to the second pillar. Direct aids are mainly distributed according to areas, without strictly rational equity. The main conditions for their payment are chiefly in accordance with European legislation; to these are added some good practices that are not very restrictive, but which give rise to complex controls on the obligations of means, for low environmental results². These direct aids now account for a considerable proportion of farmers' incomes. In some specializations (meat, sheep or cattle farming), they are structurally higher than the current pre-tax income. While they provide a stable minimum income, and play an important role as an economic shock absorber for a production or price shock, they have undesirable effects. The policy followed in France in recent years has been largely based on the gradual end of historical references, the increase in coupled aid for cattle, and the revaluation of aid in difficult areas known as natural handicap compensation. This policy has shifted aid from areas of large-scale cultivation and intensive livestock farming (west of a Toulouse-Strasbourg line) to mountain regions and extensive livestock farming areas where incomes were structurally lower. The implementation of the redistributive payment as part of the 2014-2020 reform has also made it possible to support farms of less than 52 hectares, and has thereby contributed to accelerating the convergence of aid. This convergence, based on a 70% reduction in the differences from the average aid paid at national level, has made it possible to gradually reduce the link between DPB and historical references, bringing the level of aid paid between farms, regardless of their production system and location. Despite these measures, 20% of French farms currently receive 54% of the aid. France remains one of the

¹ European Commission (2018), « [Agri-food trade in 2017: Another record year for EU agri-food trade](#) », *MAP 2018-1*.

² Hart K., Farmer M., Baldock D., Brouwer F., Fox G. et Jongeneel R. (2012), « The role of cross compliance in greening EU agricultural policy », in Brouwer V. (dir. pub.) *The Economics of Regulation in Agriculture: Compliance with Public and Private Standards*, vol. 9.

Western European countries where aid is relatively less concentrated on a few farms¹.

France has also supported the recoupling of certain production aid. It won its case in part in 2013, and has since taken full advantage of the possibilities of granting "voluntary coupled support", mainly to livestock farming, and to a lesser extent, to protein crops. This policy is founded on the notion that when productions are associated with a public good, it is easier to support production than to remunerate the public good. Thus, support for breastfeeding livestock was seen as a way of maintaining permanent grasslands, true reservoirs of biodiversity, storing carbon and allowing better water management by acting as a buffer zone. Similarly, support for protein crops, while having only a very small impact on France's protein dependence rate abroad, makes it possible to support legumes, and thus limit external nitrogen inputs, a significant part of which is leached and alters the quality of continental or coastal aquatic environments (eutrophication, green algae). Yet, here too, negative effects have appeared. Aid targeted at cattle farming has scarcely succeeded in halting the decline of grassland areas still in the making. For lack of alternatives to grass for feeding ruminant animals concentrated feed, there is no strong correlation between ruminant production and public goods provided by permanent grasslands.

More generally, the application of the greening of the CAP has not improved the state of the environment in²France and in many Member States. Pressure from producers has led to derogations that have compromised the spirit of the "green payment" and its initial environmental ambition: short inter-crops between two crops of a corn monocrop are counted as "diversification" and winter wheat and spring wheat are counted as two "diversified" crops. This reality is also illustrated by the derogations from the obligations of areas of ecological interest or EIS, on which low biodiversity protection production is permitted, or the early destruction of agro-ecological infrastructure (hedges in particular) during the implementation of the 2015 reform³, and the intra-regional flexibilities left for the preservation of permanent grassland areas. The resource requirements and threshold effects also show their inadequacies: there are strong incentives to plough a prairie every four years, given

¹ Commission européenne (2015), « [Report on the distribution of direct aids to agricultural producers](#) » et [Indicative figures on the distribution of direct aid to farmers](#) (financial year 2014).

² Sirami C. (2018), "[For a real greening of the CAP: rethinking EIS for both biodiversity and farmers](#)", CAP seminar, INRA, September.

³ The criteria for accounting for agro-ecological infrastructure within or outside the agricultural areas declared for CAP support may have encouraged some farmers to grub them up in order to have areas eligible for the largest possible support.

the risk that it will be considered "permanent" in the fifth year. In total, the sudden drop in biodiversity revealed by the few available indicators --common bird population in agricultural areas, monitoring of butterflies and insect biomass, bee populations-- as well as the increase in the consumption of plant protection products and the continued simplification of field crop rotations, show the limits of the agro-ecological transition, which has not been supported - in France and elsewhere in Europe - by sufficiently targeted and binding instruments¹.

The second pillar has played a much more important role in promoting the agro-ecological transition. More generally, by being more focused on specific objectives and, in some cases, on public goods, its legitimacy appears stronger than that of direct aid under the first pillar. Some Member States, however, have made considerable transfers from the second to the first pillar, focusing on the second pillar supporting investment or production. France, for its part, has maintained a significant proportion of its budgets, with a small but positive budget transfer from the first to the second pillar, and has directed them mainly towards environmental measures and support for agriculture in difficult areas. Still, some farmers remain extremely frustrated with the second pillar, particularly with agri-environmental and climate measures (DAC). The transfer of the management of the second pillar to the regional councils, which had neither the requisite administrative capacity nor the expertise², and this amid a process of restructuring the regions, created problems for the payment of aid and administrative monitoring. In addition, the measures are considered excessively limited because they focus on only few aspects at the regional level, and are overly restrictive on means and insufficiently results-oriented. Other aspects of the second pillar such as support for innovation (the European Partnership for Innovation for Sustainable and Competitive Agriculture or PEI-AGRI) or risk management are generally well received, and are indeed drivers of local initiatives, though they affect too few farmers.

As for crisis management, the 2014-2016 dairy crisis showed the limits of the regulatory tools implemented within the framework of the CAP. The shortcomings of the Community decision-making process have not made it possible to act quickly enough to control the crisis. Public procurement supported prices, but also indicated

¹ Pe'er G., Zingrebe Y., Hauck J., Schindler S., Dittrich A., Zingg S. et Schmidt J. (2017), « Adding some green to the greening: Improving the EU's Ecological Focus Areas for biodiversity and farmers », *Conservation Letters*, vol. 10(5), p. 517-530.

² Pham H. V. and Berriet-Sollic M. (2018), "[La politique de développement rural en France. Premières analyses des programmes de développement rural dans les régions françaises métropolitaines sur la période 2014-2020](#)", *Économie rurale*, 2018-1, n° 363, p. 141-159.

that it was possible to continue to produce, but with a strong deflationary effect. The fall in prices has eradicated the influence of aid spent to support incomes. For many months, the control of production in some Member States did not prevent some others from increasing theirs, which resulted in stowaway behavior from which France suffered. France has also experienced a production reduction voluntarily initiated by producer groups. This crisis revealed that a shift towards agricultural systems with diversified production and with less rigid cost structures would be more effective in absorbing shocks than curative public intervention. Farmers anticipate that the State will *ultimately* intervene to assist them, a consideration that hinders the evolution towards more resilient systems (technically complex and potentially more costly the adoption of prudent strategies or the use of insurance or financial tools to cover risks. Economic theory, however, offers solid justifications for public intervention in times of crisis. A bankruptcy tied to the impossibility of absorbing a sudden shock of prices or quantities does not in itself constitute creative destruction. For this reason alone, it is legitimate for state intervention not to be limited to social treatment of crises.

Supply shocks are expected to increase, because of climate change and the faster circulation of more pathogens from internationalization of goods and people. The tools available to the CAP to respond to these factors appear to be limited. The budget of the "crisis reserve" is modest, and conditions for its mobilization are neither transparent nor effective. Several instruments can deal with short-term price shocks: storage aid, intervention prices, public procurement, demand actions (see Box 2). But the European Union has not given itself the means to respond ambitiously, quickly, and coherently to a deeper crisis. The treatment of crises is essentially curative, and often very costly, because of the lack of timely intervention with sufficient means. In addition, the perpetual *ad hoc* mobilization of budgets activated under pressure leads to disobliging expectations: the strong probability that rules will be violated and that the State will intervene producing behavior that *ultimately* exposes people to greater risk and crisis.

Box 2 - Crisis management instruments

At the European level. The CAP's anti-crisis "safety net" provides instruments for intervention in the event of market imbalances, in particular private storage aid and the purchase of surpluses. These measures are decided by the European Commission, which has a wide margin of discretion for triggering them (criteria such as "*severe imbalance in markets*" in Article 222 R1308/2013 are unclear and subject to political pressure from the Council and Parliament). In some sectors, intervention may be entrusted to inter-professional organisations or producer

organisations. A "crisis reserve" can also be mobilized. It is financed by a levy on direct payments, which causes strong pressure from producers not to mobilise it.

At the French level. Agricultural disasters are covered by the National Fund for Risk Management in Agriculture (or "disaster" fund). This fund is often mobilized in the event of a climatic accident. It now excludes arable crops and vines considered insurable. It can be activated when there is a state of agricultural disaster, but its onset is not very exceptional: for example, it has mobilized 340 million euros for the 2012 frosts, 150 million for the 2014 drought, 50 million for the 2014 floods, 81 million for the 2016 floods, etc. Sanitary and phytosanitary crises give rise to intervention by the National Agricultural Fund for the Pooling of Sanitary and Environmental Risk (FMSE). This fund compensates producers for losses. It is financed by the European budget in the event of annual production losses of more than 30%. For losses of less than 30%, rapid interventions from the national budget (National Fund for Agricultural Risk Management, FNGRA) are possible to contain health crises.

3. The post-2020 CAP: towards a renationalization of agricultural policy?

The European Commission presented its budgetary proposals and possible guidelines for the future CAP on May 2 and 29 2018¹, respectively. The future CAP would be constructed on a multiannual budget of €365 billion for the period 2014-2020, which would represent a 5% decrease in the EU budget for agriculture in current euros compared with the current period after taking into account Brexit. The practical details of what could remain common-- the conditionality of first pillar aid that could integrate current greening measures--still remain poorly known. But the Commission's presentations suggest that this common ground could be substantially reduced. The procedures for granting first and second pillar aid would be based essentially on compliance with some of the current criteria for green payments -- diversification, EIS, maintenance of permanent grassland. First pillar support would remain conditional on compliance with directives, including the Water Framework Directive, and Member States would have the possibility of adjusting all other conditions for granting payments. Further greening could be based on an "*Eco-scheme*", which must be defined by each Member State. This *Eco-scheme* would be voluntary for farmers to encourage the adoption of climate- and environment-friendly

¹ Commission européenne (2018), « [Proposal for a regulation of the European Parliament and of the Council](#) », COM(2018) 392 final, Bruxelles, juin.

agricultural practices beyond the mandatory requirements of enhanced cross compliance, which would integrate existing green payment obligations and, potentially, new requirements. Agri-environmental and climate measures (DFAIT) would be maintained. At present, the operational distinction between the *Eco-scheme* and DFAIT is unclear. Payments from the *Eco-scheme* would be theoretically 100% European, while DFAIT would remain co-financed by national and/or regional funds, like the other measures in the second pillar. The instruments associated with risk management would be renewed, but with a European budget that would be proportionally reduced more sharply than the first pillar¹. In addition, *Eco-scheme* payments could no longer be limited to profit losses or cost increases alone, which could open the door to payments for environmental services (PES).

This subsidiarity is presented in terms of efficiency, simplification, and the need for a more sustainable policy. Yet these goals appear difficult to achieve considering the Commission's current proposals. While several evaluations, including the European Court of Auditors' Special Report 21/2017², show that the "greening" of the 2013 regulations has had little appreciable impact on improving the state of the environment, these regulations did introduce a mandatory common framework centered on the "green payment". It seems almost inevitably to be integrated into the principle of conditionality. This would confirm the current functioning of green payments more a result of historical aid, capped and conditioned, than of increasing remuneration with the desired environmental effect. A major part of the CAP (40%) would necessarily address climate objectives in effect for all European States according to a distribution between the first and second pillars left to the discretion of each Member State. This obligation does not specify a distribution between mitigation and adaptation objectives, and it raises the question of its consistency with other CAP measures that may have potentially opposite effects, among them aid to ruminants.

In addition, the second pillar would be subject to budget cuts, though it concerns environmental, climate and biodiversity issues. The obligation for Member States to devote more than 30% of their EAFRD budget³ to environmental and climate objectives could thus be offset by the potential reduction in its budget. The cap on direct aid under the first pillar to improve its distributive aspects should have little

¹ Thus, French agriculture, which historically benefits much more from the first pillar than from the second, is relatively well treated compared to that of other countries for these Commission proposals. This does not apply to all categories of farmers or to all regions.

² European Court of Auditors (2017), *Greening: Increased complexity of the income support system and still no environmental benefit*, Special Report No 21/2017.

³ European Agricultural Fund for Rural Development.

impact as the ceilings would be increased by employee salaries and equivalent standardized salaries for non-employees. As for the simplification of the CAP, it essentially consists in postponing the definition of policies, their monitoring and control over the Member States, thus transferring a large part of the administrative burden to them.

The future CAP could turn out to be less and less "common." While future negotiations to follow the election of the European Parliament last May might significantly amend the Commission's proposals, the scenario for defining a national policy for the first pillar, as was done for the second pillar, seems possible. The analysis proposed by some Commission officials during the presentations and debates on these proposals is convergent: the "nationalization" of the CAP is already being carried out by the application of areas of ecological interest, some of whose requirements are defined at Member State level, or by the diversity of ways in which permanent grasslands are maintained. Thus the Commission's proposals endorse the evolution of the CAP, and present themselves more as a political change to guarantee accountability for Member States than as a technical change.

In this scenario, which affords a fairly wide degree of autonomy in the choice of measures to be implemented by Member States, there is serious risk of complicating competition within the EU. The same applies to the risk of dissension among Member States at least on environmental issues, and even those affecting social, nutritional and animal welfare ambitions. There is, however, an opportunity for France to define an agricultural policy that ignores the logic of budgetary return, an opportunity has frequently led to the use of instruments that are very effective collectively. This reform could thus constitute an opportunity to define the orientations for a more effective policy, and more congruent with society's aspirations.

For France, the development of a strategic plan affords an opportunity to rationalize a policy whose effects contradict each other, and whose logic is not always clear. Considering the difficulties inherent in applying the current CAP¹, both at national level for the payment of direct aid, and at regional level for the establishment and management of regional rural development programs (RDPRs), it seems essential to integrate ambitious simplification objectives into the forthcoming reform, and to focus more public support on public goods, the preservation of natural capital and the development of healthier diets. Simplification is not only a question of readability and

¹ See, for example, [MAAF Technical Instruction, DGPE/SDC/2016-1000 of 21 December 2016](#), and Carpon A. (2017), "The ASP started paying MAEC and organic subsidies on 3 November", *Terre-net Média*, 3 November.

legitimacy; it is also a matter of equity and competitiveness. The public and private administrative costs of the current measures are a burden that both farmers and the services responsible for their implementation denounce. The difficulty is that, in a less harmonised European framework, heterogeneous policies can trigger a race to distort competition between Member States. Especially since some Member States may give priority in their national arbitrations to productive investments or production support, which would remain a priori authorised. The challenge for France will therefore be to make a successful transition to a more sustainable agriculture without sacrificing its productivity and competitiveness.

Box 3 - The French position

In response to the European Commission's proposals, France published in December 2018¹ a position on the upcoming discussions on the future CAP centred around six main areas:

- a common and strong CAP at the service of a strong Europe, based in particular on a limited number of optional mechanisms and on the maintenance of a common "basic payment" for all Member States;
- a CAP that supports the transformation of agricultural sectors and provides food;
- a CAP that has an environmental ambition by giving the agricultural sector the means to achieve its agro-ecological transition;
- a CAP that protects against climate, health and economic risks;
- a CAP that ensures the renewal of generations, the vitality of rural areas and protects the most fragile and remote territories;
- a simpler and more comprehensible CAP for farmers and citizens.

¹ Alim'agri (2019), "[La position française sur la négociation de la politique agricole commune après 2020](#)", 22 March.



CHAPTER 2

THE CONTOURS OF A MORE LEGITIMATE AND EFFECTIVE CAP

1. Major objectives to be achieved

Given the current unsatisfactory situation and the future CAP, as proposed by the Commission, the preparation of a national strategic plan for the first and second pillars in addition to the existing regional rural development programs affords an opportunity to implement an effective and simplified agricultural policy. It must meet several objectives:

- to develop sustainable agricultural systems to reduce the consumption of natural resources, reduce the negative impacts of agriculture on the environment, and increase its positive effects;
- to ensure a decent standard of living for the agricultural population by increasing the individual income of those working in agriculture;
- to meet societal expectations for food and health concerns related to food and agricultural practices;
- to anticipate crises and reduce fluctuations in turnover and operating income;
- to improve the added value of the agri-food sectors.

These aims must be pursued while reducing administrative complexity. This burden is not only a consequence of factors at the European level, but to the implementation choices made by Member States as well. France, indeed, has often chosen complex solutions faced with pressure from interest groups. The maintenance of historical individual references to payment entitlements after 2003, under pressure from

producers who have lost aid, the implementation of certificates for the¹ saving of plant protection products under pressure from producers reluctant to pay environmental taxes and the application of the polluter pays principle are all examples. An important avenue for simplification is the use of tax tools rather than complex *ad hoc* mechanisms whose effects often overlap and contradict each other.

More generally, several general principles must be implemented in a coherent manner to achieve the objectives mentioned above:

- **Bringing the CAP closer to the principles of public economy:**
 - by implementing environmental taxation founded on the two principles of the polluter-pays principle and its mirror, the subsidised supplier;
 - by using public money to finance public goods, including public information needed to develop risk and crisis management tools as well as environmental impact-based instruments;
 - by intervening for transparent and fair market functioning, avoiding the establishment and maintenance of dominant positions for inputs, marketing, processing and services, including agricultural insurance, and by removing regulations generating situation rents.
- **Establish conditions to ensure that farms are more resilient to risks and are truly resilient:** in a word, that they are able to overcome these risks. One way to achieve this aim is to promote the diversification of production, and the autonomy of farms by improving their shock absorption capacities. Conversely, *ad hoc* public curative tools and counter-cyclical instruments should be avoided: first, because they encourage the maintenance of production if there are surpluses; second, because they encourage specialization and exposure to risk, thereby calling for more public intervention.
- **Support production methods and types that contribute to improving the nutritional and health quality of the food supply** including limiting the use of

¹ The Certificate of Saving of Plant Protection Products (CEPP) is a regulatory mechanism to reduce the use of pesticides, based on the Energy Saving Certificates (EEC). This system encourages distributors of plant protection products to promote or implement actions to reduce the use of these products among professional users. By declaring these actions, distributors obtain certificates attesting to their implementation and compliance with their obligations.

inputs that can affect human health and environmental quality throughout the food chain.

- **Support agricultural and agri-food innovation** and its dissemination through independent advisory structures.

Three main implementation principles must also complement these fundamental elements:

- **Limit the use of instruments based on quantities, quotas, and agronomic requirements**, which may prove more costly because of threshold effects, and difficult to administer and control¹.
- Base the instruments implemented on indicators grounded on variables easy to observe, or already routinely recorded to **limit the administrative and transaction costs** incurred by farmers².
- **Systematize the conditionality of aid on observed results** using these indicators, mobilizing all available information technologies.

2. Instruments for a coherent supply of public goods

The mobilization of public resources is justified by the financing of positive externalities and public goods. Public money must be allotted to them more than before, and an end put to aiding systems that generate negative externalities like diffuse water pollution caused by the intensive use of fertilizers or pesticides. Support for positive externalities --maintenance of hedges, permanent grasslands or wetlands contributing to the preservation of the environment-- must be complemented by: (i) malus guaranteeing the sustainability of the positive effects obtained by previous aid targeted at these public goods and limiting any reversal; (ii) taxes aimed at reducing negative externalities. Concretely, the aim is to organize a transition of agriculture

¹ For example, input control measures on some parcels and not on the whole farm are very difficult to control. See McCann L. and Easter K. W. (1999), "Transaction costs of policies to reduce agricultural phosphorous pollution in the Minnesota River", *Land Economics*, vol. 75(3), pp. 402-414; Mettepenningen E., Beckmann V. and Eggers J. (2011), "Public transaction costs of agri-environmental schemes and their determinants - Analysing stakeholders' involvement and perceptions", *Ecological Economics*, vol. 70(4), pp. 641-650.

² McCann L. (2013), « Transaction costs and environmental policy design », *Ecological Economics*, vol. 88(C), p. 253-262 ; Abler D. (2004), « Multifunctionality, agricultural policy, and environmental policy », *Agricultural and Resource Economics Review*, vol. 33(1), p. 8-17.

targeting global public goods¹ in particular such as climate and biodiversity rooted in the technological flexibility of agriculture and the adaptability of farmers, already broadly demonstrated. It is not a question of opposing good and bad production systems, none of which is better in every respects. Rather it is an issue of offering incentives for everyone to innovate and develop new skills to move in the “right” direction as measured by uncontested indicators.

To this end, the French national strategy should use first pillar payments to finance a bonus-malus system aimed at global public goods. At the same time, coupled subsidies that subsidize polluting activities - including subsidies for the breeding of ruminants emitting greenhouse gases - would be abolished, and a system of input or output taxes with negative externalities would be implemented. The goal is to gradually proportion the aid to the environmental services provided by the areas concerned. The rationale is to prioritize incentives rather than prohibitions, quotas, and agricultural practice requirements.

The combination of bonuses and maluses will engender support for farms that engage in environmentally beneficial practices, and penalize those that adopt damaging techniques and production methods in terms of externalities. This includes building on the achievements of permanent grassland, and areas of ecological interest throughout Europe.

3. An approach to risk and crisis management of public goods.

Promoting risk resilience and the resilience of farms and agricultural systems also involves financing a form of public good. Indeed, curative and late interventions are costly. Public policy must promote, above all, the adaptability of production systems at risk, and must not deter either prudence and precautionary behavior, or the recourse to private tools and market mechanisms.

For market management and crisis prevention little room exists to maneuver for a national policy. Indeed, more Community coordination than during the dairy crisis in 2015 should be advocated. For better crisis management, the rules must be more structured *on forecasts*, and not be manipulated. Several instruments are possible, beyond the mobilization of an insufficiently solicited crisis reserve: penalties for

¹ Global public goods are those goods whose consumption by a given economic agent does not affect the quantity available to other agents and which are present on the planet. In practice, they correspond to resources, goods or services that benefit everyone, and whose exploitation or preservation can justify international collective action.

overproduction, bonuses for voluntary production reduction, transferable delivery licences, and so forth. It is also necessary, by limiting the use of curative aids, to change the incentives for specialization, putting an end to the belief that the State will systematically be a savior. In this perspective, European regulations must specify in advance the possible forms of intervention both on demand (the means of private and public storage) and on supply (the ways of coordinated restriction of supply on a European scale). The conditions under which an independent authority charged with triggering storage and voluntary production reduction premiums would limit inter-temporal and spatial inconsistencies. Such an authority should be able to reduce support to farmers who do not participate in coordinated supply management. In a serious crisis, producers increasing their production volumes could be penalized financially. The sums saved or collected would feed the crisis reserve, whose multiannual budget would also be replenished by the penalties outlined in the previous points. Without an independent European authority, an alternative would be for Parliament and the Council to give the European Commission a multiannual mandate from predictable rules.

In addition, at the national level there is considerable scope for organizing the transition from essentially curative solutions to preventive approaches, aimed at strengthening the capacity to absorb shocks through the diversification of income sources and more flexible cost structures. Production diversification, greater independence from certain incompressible charges --repayment of loans linked to major material investments or the cost of animal feed not produced on the farm-- and risk sharing throughout the sector, and no longer just at the farm operator's level should be encouraged.

The adverse effects of counter-cyclical payments, which blur price signals and offer no incentive to diversification or extension of rotations¹, justify their exclusion from public instruments. To a lesser extent, income insurance defined for a particular risk may have comparable effects. Hence, their subscription does not appear to require State support. But global income insurance for the whole farm encourages less specialization in a few productions than the coverage of a specific risk for a production. In addition, it is possible to adjust the level of premiums according to the diversification of production, or more generally of the farm's sources of income, since the insurance companies themselves are prepared to reduce premiums for policyholders who have implemented prudent, risk diversification behavior. Above all,

¹ In the event of a price reduction linked to overproduction, a farmer has an incentive to reduce the production concerned and to increase the other production on his holding. Counter-cyclical subsidies blur this market signal: the specialized farm will have no reason to reduce its production or to diversify.

it is important to ensure that public policy does not discourage the use of private instruments provided these do encourage diversification of production--forward hedges, contracts, insurance, mutual funds. However, it is precisely the opposite of *ex-post ad hoc* curative intervention and counter-cyclical aid policies. Instead, the government should make available the necessary data to bring in new insurance companies (index insurance), and mutual funds involving processors.

At a community level, principles of conditionality could encourage preventive measures. Reserving the benefit of the "crisis reserve" or a certain number of grants for companies that have diversified their production, taken out insurance policies or participated in mutual funds might be considered. Otherwise, such possibilities could be implemented at national level if the subsidiarity logic proposed by the Commission were to become necessary in the context of the future CAP.

More generally, at national level, the risk management policy should be consistent with the other objectives of the CAP. From this point of view, contracts for the provision of public goods must be at the center of public risk management policy: payments under programs for the conservation of rare genetic resources (peasant seeds or hardy species), already supported by the CAP, are independent of market fluctuations, and production variability. This allows each farmer to freely engage in these conservation programs, and to modulate the share of the fixed payment remunerating the public good within his income. These payments open the door to a determination by the operator of the "risk-free" income share, corresponding to his level of risk aversion. If the latter is high, the farmer will commit himself strongly to a conservation program, so that the corresponding aid provides him with income stability. We must, therefore, organize the bonus system remunerating a public good offer to enable farmers to contract depending on the level of effort they decide.

The metric of such contracts remains to be defined: green points, corresponding to the scoring of farms according to the agro-ecological infrastructure they contain, have been successfully tested in agri-environmental programs, but they are not necessarily adapted to all situations. Therefore, each farmer can adapt his efforts to his opportunity costs and risk preferences.

4. A CAP that contributes to improving public health and food supply

The CAP is only one element of food and health policy. Before being offered for consumption, agricultural products undergo processing, preservation and transport

that affect their nutritional properties and prices. The agricultural price generally represents only a small part of the price of processed food. Agricultural policy is therefore, not a powerful lever for reducing the price of food to improve the nutritional quality of the food ration --fibres, vitamins, minerals-- or for increasing the price of food that deteriorates this quality (sugars, fats). However, agricultural systems that provide most foods of high nutritional value should be supported more than others. In addition, the consequences of agriculture to health are not only related to food consumption, but also to water and air quality on which agriculture has a significant impact through its spatial influence.

Societal concerns about food are diverse. Expectations for sustainable diets, on the one hand, and for the re-territorialization of food systems, on the other, are increasingly expressed, though these goals may be difficult to reconcile. Yet agricultural activity as a whole does contribute to pollution of the environment, influencing human health by long-term exposure of populations either directly by respiratory route or indirectly by food. It also causes immediate exposure of agricultural workers to chemicals:

---the presence of chemical residues, some of them with potential endocrine disrupting effects in the food chain²;

- soil and air pollution related to pesticides and trace elements such as certain metals : copper used in particular in viticulture, organic farming and conventional agriculture;
- direct exposure of users and riverside populations to chemical contaminants;
- the release into the environment, land and water, of antibiotic residues, and organisms that have acquired resistance genes;
- water pollution by nitrate and pesticides that account for more than 90% of agricultural activity;

¹ "Sustainable diets are diets with low environmental impact that contribute to food and nutritional security and healthy living for present and future generations. Sustainable diets help to protect and respect biodiversity and ecosystems, are culturally acceptable, economically equitable and accessible, affordable, nutritionally safe and healthy, and optimize natural and human resources. "(FAO, *Biodiversity and Sustainable Diets*, 2010).

² Schillinger P. and Vasselle A. (2017), *Endocrine Disruptors in CeuticPlant Protection Products and Biocides*, Paris, Senate, Information Report No. 293, 46 p.

- air pollution, with the agricultural sector responsible for 98% of ammonia emissions, 76% of methane emissions, 10% of nitrogen oxide emissions, and 20% of primary suspended particulate matter.

The costs of treating this pollution are only marginally integrated into the purchase prices of food. In addition to the purchase value of agricultural products and public subsidies allocated to agriculture, there are, therefore, costs related to the negative externalities generated.

Preventing and limiting animal and plant health risks is also a means for the resilience of the sectors, and for improving the sanitary quality of production. In animal health, investments in the prevention of health risks --prophylaxis, biosecurity-- should be encouraged. In the plant sector, more diversified and long-rotation agro-ecological production systems can limit the emergence and development of diseases and pests—the use of mixed species and of companion plants, the selection of resistant varieties, the establishment of agro-ecological infrastructures, and so forth. The use of biocontrol products and mechanical weed control instruments also complement this approach. These practices and mechanisms must be combined in a so-called *One Health* approach, aimed at integrating the treatment of public health, animal health and health-environment issues at all territorial levels. They can present synergies with *One Welfare* approaches, which aim to reconcile animal and human welfare.

Box 4 - Further avenues for reform

There are many proposals for CAP reform, and several organizations or think tanks have made their proposals. As early as 2015, the Economic Analysis Council pointed out the limits of the French agricultural model for employment, income, commercial performance and environmental protection. The ACE called for a refocusing of agricultural policies centered on the preservation of natural capital¹.

In March 2017, the "CAP Group" of the Academy of Agriculture published a report presenting several reform proposals for the future CAP², focusing on:

1 - Stabilisation of markets, by mobilising the available instruments --withdrawal from the market, free distribution, private storage aid, temporary reduction in production, exceptional increase in customs duties...This would involve defining

¹ Bureau J.-C., Fontagné L. and Jean S. (2015), "[L'agriculture française à l'heure des choix](#)", *Les notes du Conseil d'analyse économique*, n° 27, December.

² Bazin G. *et al* (2017), [Which CAP for which agriculture?](#) Académie d'agriculture de France, March.

warning indicators, and reviewing the financial resources dedicated to this regulatory objective.

2 - Volume control by intervention devices for storage and retrieval. However, they must be accompanied by mechanisms that limit their use in time and quantity, which requires production control measures such as voluntary production reduction and set-aside programs, and supply management, which can be adjusted to the state of stocks.

3 - Border protection made necessary by the volatility of world markets for the main European productions, and its renewed argument because of the additional costs associated with the standards imposed on EU producers.

4 - The implementation of counter-cyclical support for a market crisis and insurance in a climate or health crisis.

5 - The strengthening of contractualization in the sectors, involving the cooperative approach that permits risk amortization and rebalancing value creation. This would involve improving the information provided to agents to enhance their knowledge of markets, thus reducing the endogenous dimension of price volatility.

6 - Remuneration for non-market environmental, climate and territorial services provided by farmers, within the framework of contractual and collective approaches at the territorial level and over a period of around ten years to guarantee a sustainable supply of commitments.

At the same time, the Treasury Directorate General published a proposal for CAP reform¹ focusing on the following areas:

- maintaining a level of food security by ensuring that sufficient agricultural production capacity is maintained in Europe, which would involve in particular the payment of: (i) decoupled support to maintain production on the territory; (ii) specific aid for young farmers to ensure the renewal of the agricultural population; (iii) aid for research and innovation to boost the sector's productivity gains and develop its competitiveness;
- better management of production and market risks to combat the volatility of agricultural commodity prices and to cope with climatic, health and economic risks. Part of the decoupled payment could be conditional on taking out climate risk insurance to encourage market development;
- sustainable management of natural resources, by internalizing both the negative externalities caused by agricultural activity and its positive externalities. All the

¹ Formerly M., Blake H., Devineau C. and Touze O. (2017), "[La politique agricole après 2020](#)", *DG Treasury working documents*, n° 2017-03, March.

environmental effects of agricultural activity should be covered by an ecological tax (taxes on pesticides, nitrogen and greenhouse gas emissions), or by a mechanism for remunerating the provision of environmental services, calibrated according to the social value of the nuisances and amenities.

In December 2017, the think tank Momagri (Movement for a World Organization for Agriculture) proposed a revision of the CAP¹ based on the integration of crisis prevention and management mechanisms and on price-based subsidies. This reform proposal aims to:

- 1 - Implement regulatory mechanisms to ensure that farmers have sufficient visibility and a fair return on their production.
- 2 - Improve the functioning of European agricultural markets by correcting market failures and promoting efficient modes of economic organization of producers within sectors.
- 3 - Encourage European production in quantity and quality to optimize food safety.
- 4 - Ensure better prevention and management of the various risks, especially market risks, to which farmers are exposed.
- 5 - Provide greater economic security for the agricultural sector both for producers and consumers and intermediate actors to enable effective progress in social and environmental matters.
- 6 - Optimize budgetary efficiency of the CAP and restore real "Community added value".
- 7 - Fill the gap between the current CAP and the strategic orientations of the agricultural policies pursued by the world's major economic and agricultural powers.

To achieve these objectives, Momagri proposes an aid scheme based on a price tunnel that conditions the payment of aid to farmers. Below a floor price, a counter-cyclical support mechanism would be introduced, reinforced below a regulatory threshold by the implementation of public storage and the activation of measures to stimulate markets (biofuel production) or to reduce production. Symmetrically, above a threshold of "financial solidarity", a tax on financial transactions would be applied to limit speculation and public stocks would gradually be released. A one-off aid of €75 per hectare would also be paid to farmers to compensate them for the efforts they are required to make in terms of the environment and land management.

¹ Momagri (2017), *White Paper: A New Strategic Direction for the CAP*, December, 104 p.

The "For another CAP" collective, bringing together 35 environmental protection and international solidarity associations, trade unions and professional agricultural organisations, published in June 2018 a set of twelve proposals aimed at creating a common food and agricultural policy (CAP) and accelerating the agro-ecological transition¹:

1 - Co-construct the CAP with citizens and public environmental and health stakeholders by opening up governance bodies to civil society and decision-makers in charge of the environment and health at all territorial levels.

2 - Support production for healthy, high-quality food by creating coupled subsidies for fresh fruit and vegetables and legumes produced in agro-ecology.

3 - Develop local food supply dynamics that meet citizens' expectations by making projects for the development of territorial production or processing chains and territorial food projects eligible under the second pillar.

4 - Make organic farming accessible to all by allocating significant funding for the maintenance and development of organic farming.

5 - Financing the agro-ecological transition of farms, in particular the exit of pesticides, by allocating a significant part of the budget to agro-environmental and climate measures as well as to aid for farm diversification and autonomy.

6 - Remunerate practices especially favorable for the environment by allocating at least 40% of the first pillar budget to payments for environmental services, while preserving the coupled support budget.

7 - Make the conditions for granting aid readable and effective in relation to the objectives pursued by adapting cross compliance to increase the ambition of environmental criteria and create social and animal welfare cross compliance.

8 - Manage health and climate risks upstream by encouraging farms to forego all public financing of private insurance and instead finance the improvement of farm resilience.

9 - Empower farmers to protect themselves against price volatility, and thus guarantee them an income by implementing effective market regulation, and production volume control mechanisms.

10 - Stimulate agricultural employment rather than farm expansion by capping all asset subsidies and increasing the first hectares or animals.

¹ For another CAP (2018), "[Our 12 priorities for post-2020 VIP](#)".

11 - Support the installation of all agricultural projects by raising the age limit for receiving installation assistance and adapting the support offered in the pre-installation process to each project.

12 - Put an end to imports and exports that harm farmers in both South and North countries by rejecting any new free trade agreement and putting in place a system for the repayment of CAP subsidies for raw materials exported outside the EU.

Our reform proposal incorporates some of these elements, particularly the principles of remuneration for amenities rendered by agriculture for an agro-ecological transition and the taxation of negative externalities.



CHAPTER 3

A PROPOSAL FOR INSTRUMENTS IMPLEMENTED AT NATIONAL AND EUROPEAN LEVELS

1. The general principles

The payments of the current CAP are the legacy of a time in which prices were sustained and high yields favored. The introduction of environmental concerns into the CAP is recent, and has not yet resulted in the payment of subsidies proportional to those agricultural practices favorable to the environment like carbon sequestration, and preservation of biodiversity.

The CAP currently being implemented also represents a shift towards a form of re-nationalization of agricultural policy, with: (i) a revival of aid coupled to production or factors of production, (ii) basic payment entitlements that gradually converge within each Member State towards a target value at a specific pace, (iii) EIS, crisis management arrangements and highly differentiated applications of the Rural Development Regulation from one country to another. To a certain extent, the Commission takes note of this movement that it had at least in part introduced in its own proposal for the future CAP by leaving Member States still more freedom to choose their instruments, and by rendering them accountable for their results. This choice poses a risk to competition in our single market for global public goods, for the provision of which economic efficiency requires equal marginal costs. It is potentially an encumbrance for France, which has campaigned to introduce a large number of options for regulating the implementation of the CAP, while at the same time de-

centralising part of rural development to the regions---measures that have proved at once costly to apply administratively and difficult to control¹.

The CAP as perceived by farmers is a set of contradictory technical requirements and incentives combined with multitudinous forms that do not always guarantee the payment of requested aid. The complexity and instability of the system feeds a permanent apprehension of controls and sanctions, however modest. In addition, the fact that the aid is not necessarily proportionate to the jobs created on farms is increasingly difficult to justify.

Our proposal is intended to:

- be a coherent set of measures based on the principles of the public economy notably the polluter-pays and payee-pays principles,
- take into account the existing information system, and past public spending on investment in green infrastructure, intra-European and international competition, participation constraints, and the need to simplify instruments.

First, we recommend subsidies and taxes proportional to observable, verifiable indicators that are better correlated to expected environmental impacts. The aim is to break away from aid coupled to market production, and aid based on minimum practice thresholds, with derogations for multiple productions or production systems below these thresholds. Because the Commission's budgetary proposal for the future CAP is decreasing, the levying of taxes has the advantage of discouraging practices harmful to health and to the environment while providing the means to finance virtuous practices more generously. A system of reimbursement (malus) of public expenditure invested in the construction of public goods (amenities of permanent grasslands and EIS) if destruction occurs makes it possible to secure their maintenance, since these public goods have been financed by current payments. This public payment scheme offers to each farmer an opportunity to mitigate the variability of his income according to his risk aversion in accord with portfolio choice theory. Everyone can adapt their production, with uncertain yields and prices, and, at the same time their taxes and subsidies (some) according to their choices of crop rotation and practices. The other interest is to give a clear direction to investment and innovation. This has not been the case until now, since once the thresholds have been respected, price expectations dominate investment choices. The introduction of Europe-wide taxes would require a unanimous decision by all Council members,

¹ An illustration of the paradoxes of this partial control can be found in the national penalties in the event of the Commission's refusal to discharge measures under the second pillar implemented at regional level.

which is by definition difficult to achieve. However, the initial implementation of a national tax would be a major step forward, because the payment of all tax revenues to farms in transition to agro-ecological practices would limit its effects in terms of competitiveness.

Some farmers, by their location, have a special responsibility towards the environment (Natura 2000 areas, catchment protection). Since their action only makes sense in a coherent territorial project, it is necessary to take these specificities into account.

The reform here proposed could put some farms known to be particularly polluting or benefiting from coupled support into financial difficulty unless a transition phase is applied. Thus taxes and penalties should be introduced gradually to allow farmers time to adapt, with rates increasing according to a known trajectory. Coupled support should first of all be decoupled and integrated into the basic payment. Finally, we propose to change the basis of this basic payment at national level from area aid to aid for agricultural workers, whether employed or not. This is consistent with the Commission's proposal for a degressivity rate and establishing a ceiling on aid. Finally, innovation and investment aid would be reserved for farmers engaged in experimentation and ecological transition.

2. Tools for the agro-ecological transition

2.1. Instruments for biodiversity and climate

A bonus for the diversification of production

The purpose of this bonus is to diversify the rotation and herds of the farm, and to extend the rotations. The diversity of productions in space and time is, indeed, desirable (see Box 5). This was already the objective of the green payment, setting a minimum threshold of three crops a year. However, this condition was already met by most farms even before this obligation went into effect¹. Maize monoculture has also been granted a derogation. In addition, the amount of the green payment does not increase with the number of species under cultivation for a given year, nor with the extension of cultural successions². For the next CAP, the Commission proposes to

¹ Commissariat général au développement durable (2012), *Diversification of cultures in French agriculture. État des lieux et dispositifs d'accompagnement*, Études et documents n° 67, July.

² The succession or rotation of crops on a given plot of land varies greatly depending on the production methods. This distinguishes between short rotations over two or three years (e. g. rape - wheat -

move from support for the diversity of crop rotation --several different crops on a given farm at a given time-- to support for the extension of rotations: increase in the number of successive different crops on a given plot. The important point is to avoid a new threshold effect that does not provide much incentive like making the payment conditional on the crop of the year being different from the two preceding ones on the same block, and to define payments that increase well with the extension of rotations. The diversity of crops in the space is measurable by the Shannon index, which increases with the number of crops, and the even distribution of their surface area. This index can be calculated from the area declarations currently recorded in the graphical parcel register. Appropriate treatment of associated crops, especially for temporary grasslands with several cultivated species, is easily possible, that is, by counting the area as many times in the Shannon index as species are sown, but this requires the corresponding evidence such as seed invoices. Similarly, farms can be included in the calculation of the Shannon index. Data collected on herds for health monitoring could be used to for this purpose. Rewarding the extension of rotations implies keeping the memory of past crops plot by plot by plot through an appropriate information system¹.

Box 5 - The benefits of diversifying production over space and time

Crop rotations have long been the basis of agricultural practices to preserve soil fertility and limit phytosanitary risks. The emergence of agricultural inputs in the second half of the 20th century reduced the diversity of crop species and the specialization of agricultural production systems. The diversification of crop rotation in space and time at farm and sector level, however, offers many benefits:

(a) reduction in the use of chemical inputs (pesticides and fertilizers):

- regular crop changes on a plot break weed growth cycles ("weeds"), avoiding the use of herbicides;
- since pathogens (insects, fungi, bacteria, viruses) are adapted to certain species of so-called host plants, the alternation of host and non-host plants reduces the relative risk of disease outbreaks and thus reduces the use of insecticides and fungicides;

barley) and long rotations, where a large number of crops are grown in succession (e. g. alfalfa - wheat - maize - faba beans - wheat - spring barley - clover - wheat).

¹ However, this is still technically feasible.

- the introduction of legumes (alfalfa, peas, lentils) in crop rotations makes it possible to fix the nitrogen in the air and transform it into "natural" nitrogen that can be used by the next crop, which reduces the supply of synthetic nitrogen fertilizers.
- (b) limitation of soil degradation, as different crops, with more or less deep roots, exploit different layers of the soil, which limits its compaction.
- (c) diversification of landscapes and plots, creating a mosaic of habitats favorable to the maintenance of biodiversity.
- (d) reduction of financial risks within the holding:
 - by reducing operating expenses related to the purchase of fertilizers and pesticides;
 - by increasing the farm's autonomy from input or feed suppliers, making it less sensitive to price changes;
 - by spreading the work peaks over the crop year;
 - by varying sources of income, which reduces risks in the face of climatic and economic risk (price volatility) and increases the resilience of farms.

A bonus-malus for permanent grasslands

This system should include a bonus for permanent grassland (areas still grassland) combined with a minimum loading condition¹, the presence of animals with benefits for maintaining biodiversity. To avoid the current threshold effects, this bonus should be based on a payment to grasslands increasing with age up to a certain limit -- increasing up to ten years, and stable afterwards. It should be associated with a malus in case of a grassland rollover. This penalty would correspond to the sum of the bonuses received in previous years ---the reimbursement of public funds invested in this contribution to global public goods. Indeed, this payment aims roughly to integrate carbon storage in the soil, and the development of grassland biodiversity with its age. A modulation of the payment according to the management of the meadow, and the animal density of the farm can monitor the benefits of grazing. The transition to the current grassland monitoring system involves: (i) individualizing the monitoring of permanent grassland currently regionalized and applying it to parcels

¹ Loading corresponds to the quantity of animals raised per unit area. It is measured in Large Cattle Units (LU) per hectare, with a bovine animal over two years old corresponding to one LU, and a small ruminant (sheep or goat) equivalent to 0.15 LU.

and (ii) applying the bonuses and maluses of five- or six-year grassland to permanent grassland already in place. Indeed, grasslands are currently considered permanent when they have not been returned for more than five years. The advantage of this age-based system is that the rate applicable to a prairie is deduced from the rate of the previous year. One point of vigilance deals with the transmission of parcels or farms, which should not be an opportunity to reset the counters. Malus and bonus rates must be tied to the plot, not to the farm.

A bonus-malus for areas of ecological interest

This bonus must be based on the areas considered in this program, which limits the risk of destruction of areas of ecological interest currently being established. It would also be associated with a malus in case of destruction. Current EISs include a wide variety of landscape elements combined on the basis of equivalence scales to achieve the minimum required surface area. These equivalence scales could be used as a basis for establishing the rates of this bonus. Much criticized by ecologists¹, they will have to be reassessed to better reflect the results of the scientific literature on the impact of the various EIS on biodiversity. Since this is a biodiversity bonus, the use of pesticides must be banned in these areas.

Taxes on pesticides and antibiotics.

A tax on pesticides - whether synthetic or not – appears essential, and urgent, because of the health consequences of these products. The amassing of scientific evidence about their damage to biodiversity, including in Natura 2000 areas where their use is excluded² is pertinent. The general level of pressure exerted by pesticides on the environment must be reduced. A tax whose rate increases by a predefined rhythm and timetable is preferable to bans on molecules. It is also frugal in transaction costs, compared with current systems such as certificates for the saving of plant protection products. It is easier to collect this tax from wholesalers or retailers than from farmers, whose invoices are not readily accessible. By contributing to the CAP budget, it will be possible to participate in the bonuses mentioned above, and to contribute to the financing of other measures such as the "agro-ecological transition contracts" described below. A similar policy could apply to veterinary drugs persistent in the environment - including antibiotics - in livestock production. For both antibiotics

¹ Pe'er G. *et al* (2017), *op. cit.*

² Hallmann C. A., Sorg M., Jongejans E., Siepel H., Hoflan, N., Schwan H. et Goulson D. (2017), « More than 75 percent decline over 27 years in total flying insect biomass in protected areas », *PLoS one*, vol. 12(10), e0185809.

and pesticides, little work has been done to define the monetary value of marginal damage for setting tax levels¹. The advantage of forecasting growth in these rates is to afford time to monitor the relevant environmental and health indicators, and to stop the growth of rates when their trend suffers a reversal. The Danish strategy provides guidelines for effective, readable, and simple pesticide taxation². A higher cost of glyphosate makes mechanical weed control or changes in agronomic practices more attractive. From a sampling of French field crops, simulations demonstrate that a tax of 35% on all pesticides would reduce their use by 25%, subject to the implementation of low-input crop systems by 90% of farmers. To achieve the target of a 50% reduction in pesticide use by 2025, it will be necessary to triple the price of pesticides³.

There is a risk of penalizing the competitiveness of national production with the gradual increase in malus on pesticides, but the progressiveness of the tax can be managed so as not to limit this effect according to the dynamics of imports and exports. It would be preferable to convince France's European partners to implement such a system in a coordinated way.

A tax on greenhouse gas emissions

A delicate point is the imposition of a tax on greenhouse gas emissions from agriculture. Agriculture must play its part in the fight against global warming, since it accounts for about 15% of the country's greenhouse gas emissions, excluding land use change and fuel consumption⁴. Without a significant reduction in methane and nitrous oxide emissions from agriculture, it will not be possible to meet the objectives of the Paris Agreement, considering that the pressure on other sectors seems unrealistic. A tax could be calculated from livestock sizes and nitrogen applications. Unlike biodiversity, GHG emissions are measured in a common unit (tons of CO₂ equivalent) for which monetary reference values exist: European market price of tradable allowances or national climate and energy contributions. As with pesticides or antibiotics, this tax can be collected from animal slaughterers or wholesale

¹ Marcus V. and Simon O. (2015), *Les pollutions par les engrais azote et les produits phytosanitaires : coûts et solutions*, Études et documents n° 136, Commissariat général au développement durable, décembre, 30 p.

² Glyphosate is taxed at €9.8 in Denmark instead of €2.8 in France.

³ Femenia F. et Letort E. (2016), « How to significantly reduce pesticide use: An empirical evaluation of the impacts of pesticide taxation associated with a change in cropping practice », *Ecological Economics*, vol. 125(C), p. 27-37.

⁴ Commissariat général au développement durable (2017), *Chiffres clés du climat - France, Europe et Monde - Édition 2018*, November.

distributors of meat and animal products that would also cover imports. This solution is effective, and is also the easiest to implement. It makes it possible to consider a national application without being monitored at European level; it would affect animal production of French origin, the rest of Europe or the rest of the world in the same way.

For fertilizers, the tax would be levied on distributors. It would replace all the instruments currently used in agriculture, which are characterized by the great heterogeneity of the abatement costs of one tonne of CO₂¹equivalent. This tax would encourage farmers to reduce emissions with lower abatement costs.

A vital point is to ensure that bonuses and taxes are prioritized according to the contribution of different types of plant cover to public goods. Thus, permanent grasslands must receive more than arable crops, however diversified these may be, because their environmental benefits are significant for carbon sequestration and biodiversity conservation. Methods exist to establish these references by country or region². These references also set the limits beyond which the proposed policy instruments would be socially more costly than the intended benefits. As with the other taxes mentioned above, their proceeds would be redistributed to agricultural holdings to finance a bonus for permanent grassland or a basic payment per farm asset.

It may seem paradoxical to encourage the provision of ecosystem services through extensive livestock farming with the maintenance of hedgerows and permanent grassland, and to indirectly tax ruminants which are the main vectors through the introduction of a meat tax. But discouraging grass-based ruminant production would lead to the closure of landscapes in disadvantaged areas, and the replacement of hedgerows by field crops wherever possible—a factor that would have negative consequences on biodiversity and carbon sequestration. More generally, ruminants make it possible to use non-tillable areas for human consumption that can only produce woody and cellulosic crops. To reconcile the supply of ecosystem services

¹ Pellerin S. Barrière L. *et al* (2013), "[Quelle contribution de l'agriculture française à la réduction des émissions de gaz à effet de serre? Potentiel d'atténuation et coût de dix actions techniques](#)", synthesis of the report of the study carried out by INRA on behalf of ADEME, MAAF and MEDDE, INRA, 94 p.

² Chevassus-au-Louis B. Salles J.-M. Salles and Pujol J.-L. (2009), [Approche économique de la biodiversité et des services liés aux écosystèmes: contribution à la décision publique](#), Centre d'analyse stratégique, Rapports et documents n° 18-2009, Paris, La Documentation française, avril, 376 p. ; Tibi A. and Therond O. (2017), "[Valuation of ecosystem services provided by agricultural ecosystems. Une contribution au programme EFESÉ](#)", Synthèse du rapport scientifique de l'étude réalisée par l'INRA, novembre, 118 p.

related to livestock farming with the need to reduce greenhouse gas emissions, it is necessary to address the questionable incentives of the coupled animal support system, which seems to have led more to the development of livestock farming in areas that are favorable to other crops (arable plains) than to encourage public goods that are supposed to be linked to meat production (preservation of extensive livestock farming in mountain and marsh areas)¹. Simulations carried out on French cattle farms suggest that the introduction of a direct incentive (bonus, for example 300 euros per hectare of land still in the making) is not in contradiction with a penalty on methane emissions (quantifying this penalty on the basis of an equivalent of 30 euros per tonne of CO₂ equivalent would give an order of magnitude of 62 euros in tax per unit of large cattle). Incentives, then, would be generally directed towards maintaining grasslands rather than animal supply. Simulations based on the Farm Accountancy Data Network (FADN) suggest that this combination of tools would increase the profitability (gross operating surplus) of farms with a grassland area (STH) greater than 40 hectares by 44% and reduce that of others, in particular the 14% without STH. Because of the heterogeneity of cattle production systems, the contradiction is, therefore, only apparent between the malus on the negative externality (methane) and the bonus in the meadow.

The abolition of the exemption from the domestic consumption tax on energy products.

The exemption would be phased out over five years, and the tax proceeds would be recycled to cover the financing of a portion of the basic payment per agricultural work unit outlined below.

2.2. A bonus for Natura 2000 areas and high natural value areas of the Green and Blue Screen

Support would be provided for a consortium of farms to guarantee territorial continuity of actions on ecological networks and to encourage them to collectively maintain or

¹ Dumont B. (coord), Dupraz P. (coord.), Aubin J., Batka M., Beldame D., Boixadera J., Bousquet-Melou A., Benoit M., Bouamra-Mechemache Z., Chatellier V., Corson M., Delaby L., Delfosse C., Donnars C., Dourmad J. -Y., Duru M., Edouard N., Fourat E., Frappier L., Friant-Perrot M., Gaigné C., Girard A., Guichet J. -L., Haddad N., Havlik P., Hercules J., Hostiou N., Huguenin-Elie O., Klumpp K., Langlais A., Lemauviel-Lavenant S., Le Perchec S., Lepiller O., Letort E., Levert F., Martin B., Méda B., Mognard E. L., Mougin C., Ortiz C., Piet L., Pineau T., Ryschawy J., Sabatier R., Turolla S., Veissier I., Verrier E., Vollet D., van der Werf H. and Wilfart A. (2016), *Roles, impacts and services from livestock farming* in *Europe*, Report of the collective scientific expertise carried out by INRA, November, 1032 p.

improve Natura 2000 areas or agricultural areas of high natural value. The European and national co-financing payment would be based on quantified commitments evaluated by surface area, and as far as possible, on environmental impact indicators, most notably, the abundance of species in the target area. Targeting aid on holdings in continuity would limit the risks of dispersal observed today on certain aid schemes.

A collective contract would allow the fungibility of the commitments of individual farms, avoiding disruptions linked to the transfer of farms. The collective aspect of the commitment pools the risks of failure linked to changes in agricultural practices -- lower yields-- by avoiding placing this risk on each farm considered in isolation. This payment could be combined with national or regional payments for additional environmental services contributing to water quality (support for organic farming in catchment protection areas) or landscapes. These local public goods are also confronted with problems of spatial aggregation of good agricultural practices.

2.3. A contract for agro-ecological innovation (CIAE)

This type of contract signed between farmers' groups and public authorities should reflect a commitment to practices allowing for the provision of local public goods, among them improved water quality due to reduced use of fertilizers and pesticides. The main directions of this contract would be developed collectively by relevant territories or sectors. They could be applied in collective contracts with or without territorial continuity. These contracts would integrate the objectives, and use one of the tools of the European Agricultural Innovation Partnership (EIP-AGRI), the operational groups. These groups are composed of various actors wishing to work together on the same innovative project: farmers, SMEs, advisors, researchers, NGOs in a given territory. These contracts would support innovation and training focused on the local agro-ecological transition in favor of local public goods

This contract would focus on financing the costs of the agro-ecological transition, especially those related to the conversion to organic farming or other types of agro-ecological specifications such as High Environmental Value (HVE), yet with added attention on the costs of training, development of distribution networks, risk protection during the first years of the transition and obtaining official quality marks. These contracts could also support the diversification of production and sources of income -- farm tourism, processing and direct sales, energy production. The structure of Economic and Environmental Interest Groups offers the framework for such collective organizations. These contracts could be defined for a long period of time, long

enough to ensure a transition from production methods to sustainability (seven years).

Actions currently included in the second pillar could be incorporated in this contract. Support for endangered breeds of livestock, for example, that constitute a cultural and genetic heritage, useful for the agricultural use of difficult environments with high natural value--marshes, mountains, scrublands--and potential for adaptation to climate change. This would make it possible not to leave the support of a common heritage solely to the initiative of the regions, which today finance specific - not necessarily permanent - actions under the second pillar.

3. A basic payment based on the number of annual work units

The purpose of this aid is to ensure that all farmers receive minimum payment, disconnected from the level of agricultural production to better withstand crises and price volatility. Agro-ecological practices can lead to a higher workload than conventional practices -- mechanical weeding in place of pesticide use-- and, therefore, require a larger workforce. This aid would also support sectors rich in employment like market gardening, livestock in particular. This income assistance would be paid to the farmer applying for CAP support, subject to compliance to prevailing environmental practices as part of the "green payment" (eco-conditioned part of the basic payment entitlement - DPB). Compared with the current situation, which takes into account historical production references, this payment would create a different distribution of aid than the actual distribution to the benefit of vegetable and tree crops, and to the detriment of arable crops and ruminant breeding. It would thus indirectly have a positive effect on the supply of fruit and vegetables, and on declared agricultural employment.

However, the immediate implementation would have a negative effect on the financial health of field crop and livestock operations to be implemented gradually. A first step would be grounded on the integration of aid coupled to basic payment entitlements (BPD). The second step would be the gradual transformation of this payment per hectare into a payment per annual work unit (AWU)¹. In addition, the current European regulatory corpus would a priori need to be amended to implement this proposal, part of a long-term forward-looking vision. A thorough legal analysis will need to be carried out to support this proposal.

¹ INSEE defines the AWU as "the unit of measurement of the amount of human labour provided on each agricultural holding". It is equivalent to the work of a person working full time for one year.

4. Instruments integrating food and health issues

Integrating food, nutrition, and health issues into the CAP means supporting and developing production methods with proven environmental and health benefits, as well as approaches to address these issues in a synergistic way. The measures and instruments presented above are in line with this objective by helping to redirect the CAP towards support for:

- the reduction of pesticide and antibiotic use;
- the diversification of crop rotation, the extension of rotations, and the development of agro-ecological infrastructures that favor the reception of auxiliary fauna and flora, thereby contributing to reducing health pressures and the need for pesticide use;
- support for sectors that are "intensive" in terms of employment such as market gardening and arboriculture, thus helping to increase the supply of fruit and vegetables;
- the possibility of supporting technical and organizational innovation within the framework of the CIAE.



CHAPTER 4

THE BUDGETARY IMPLICATIONS OF THIS REFORM

The proposed reform requires a reorganization of the CAP budget. In illustration, we propose a breakdown of the budget to implement eight of the ten instruments proposed: the basic payment per agricultural work unit, the production diversification bonus, the bonus-malus on permanent grassland (PP), the bonus-malus on areas of ecological interest (EIS) and the four proposed taxes on pesticides, fertilizers, antibiotics and greenhouse gases (GHGs).

1. An estimate of the available national budget with unchanged behavior

The total budget of the proposed CAP would be composed of the current CAP budget in addition to the amounts collected through taxes and penalties. We are, therefore, making a first assumption here: the CAP budget will be maintained for the coming years. It is difficult to estimate the second part of the budget at this stage considering its direct dependence on farmers' choices, themselves influenced by current and future policies. We are reasoning here in the short term, and consider that for the first year of implementation of the new CAP, farmers' practices will remain unchanged. To quantify this budget, we are proposing an estimate derived from data observed in 2018 (input consumption, greenhouse gas emissions and arable land).

1.1. The current CAP budget

The budget for agricultural subsidies in France reached 7.4 billion euros in 2018 , taking into account operating subsidies (excluding CICE), and removing subsidies on products, excluded from our proposals¹.

1.2. Tax revenues related to taxes

All calculations are detailed in the appendix and summarized in Table 3 rooted in constant practices (based on 2018 data). The various taxes proposed, the costing of which involves making a number of assumptions that will need to be further developed, could theoretically generate between €4 and €11 billion in the long term, depending on the rates adopted. In the low hypothesis, the malus would represent 20% of the price for fertilizers and antibiotics, and 15% of the cost for antibiotics.

Table 3 - Estimated revenue per tax

Type of tax	Values of the selected rates	Source for the rates used	Total amount collected by the tax
Fertilizers and soil improvers	0.2 to 0.7 € per euro purchased	European experiences	700 to €2,450 million
Pesticides and agrochemicals	0.15 to 1 € per euro purchased	European experiences and targeted reduction levels	495 to €3,300 million
Antibiotics	0.2 to 0.7 € per euro purchased	Scientific article ²	150 to €525 million
GHG	30 to 56 €/t _{CO2e}	French carbon tax path (MTES)	2,690 to €4,939 million

Source: France Stratégie

Fertilizers

To estimate the budget that the fertilizer tax represents, we use the intermediate consumption data of the agriculture branch in value terms from the nation's provisional accounts for 2018. Thus, the total value of fertilizers consumed in 2018 amounted to 3.5 billion euros. The range of the chosen tax rate is based on the

¹ INSEE - [Estimated agricultural accounts for 2018](#): farm subsidies alone represent 7.8 billion euros but take into account subsidies linked to the CICE, not coming from the CAP budget.

² Van Boeckel T.P., Glennon E.E., Chen D., Gilbert M., Robinson T.P., Grenfell B.T., Levin S.A., Bonhoeffer S. and Laxminarayan R. (2017), "[Reducing antimicrobial use in food animals](#)", *Science*, vol. 357(6358), p. 1350-1352.

experience of other European countries¹. When these rates already used are levied on the quantities of product (kg), they result in price increases that we use as a possible tax level. Our calculations allow us to estimate revenues of 700 million to 2.5 billion euros depending on the level of tax withheld.

Phytosanitary products.

For pesticides, we accept a tax on prices, but not on the quantities of active dose used². Here, too, we use the intermediate consumption data of the agriculture branch in value terms from the nation's provisional accounts for 2018 (3.3 billion euros in pesticides and agrochemicals). The range of tax rate chosen is calculated from the experience of other European countries³ (see Annex 2), or on studies or recommendations based on reduction targets for the use of these products⁴ (pesticides) (Annexes 3 and 4). Our calculations forecast revenues of €495 million to €3.3 billion depending on the level of tax withheld⁵.

Greenhouse gases

We use the amount of the French carbon tax retained by the ecological transition law for green growth. In 2017, it reached 30.5 €/tonne of CO₂⁶. Given that in 2017 agriculture emits 88.2 Mt CO₂ equivalent, 41.8 Mt of which is attributable to livestock farming⁷, this tax could represent 2.7 to 4.9 billion euros.

¹ Marcus V. and Simon O. (2015), *Les pollutions par les engrais azote et les produits phytosanitaires : coûts et solutions*, Études et documents n° 136, Commissariat général au développement durable, décembre, 30 p.

² For a more precise result on the tax on plant protection products, the calculation of the consumption tax in number of unit doses (NODU) should be carried out, an indicator that reflects the use of plant protection products and takes into account the product doses applied in contrast to the treatment frequency index (IFT) or the consumption in value of pesticides.

³ Marcus V. and Simon O. (2015), *Pollution by nitrogen fertilizers and plant protection products: costs and solutions*, *op. cit.*

⁴ Butault J.-P., Delame N. Jacquet F. and Zardet G. (2011), "*L'utilisation des pesticides en France : état des lieux et perspectives de réduction*", *Notes et études socio-économiques*, n° 35. Centre d'études et de prospective, October.

⁵ For comparison, the current non-point pollution charge is 0.9 to 9 euros per kilogram of substance used depending on toxicity; see [Article L213-10-8 of the Environmental Code](#).

⁶ See "[Carbon Taxation](#)", Ministry of Ecological and Solidarity Transition, 9 January 2017.

⁷ CITEPA data Kyoto Climate Plan Kyoto April 2018.

Antibiotics

The estimate of the agricultural accounts in 2018 puts veterinary expenditure at 1.5 billion euros. We assume here that half of these veterinary costs are attributable to antibiotics, regardless of the type of farming, which is a high assumption. We use a tax level that would reduce the use of veterinary antibiotics by 31%¹. By proposing a range of variation for this rate, this tax leads to a budget of 150 to 525 million euros.

The penalty for turning over permanent grasslands and destroying agro-ecological infrastructure

We consider here that the amount of the bonus for the maintenance of permanent grasslands and the amount of the penalty for their reversal are sufficient incentives for farmers to maintain their existing grasslands. We make the same assumption for agro-ecological infrastructure. No malus is therefore applied.

2. Estimates of the budgets required to finance the premiums

2.1. The basic payment per agricultural work unit

The current envelope allocated to PBOs, and the green payment would provide the basic payment per agricultural work unit. With a total sum of €5.7 billion in 2018 and 711,000 FTEs in 2016² (structural survey), we can plan for an annual aid of about €8,000/FTE/year compared with an average of €135 per hectare today for basic payment entitlements in metropolitan France.

2.2. Premiums for the agro-ecological transition

The permanent meadows bonus

The monetary values of the carbon sequestration service by the prairies in France were evaluated this year by the Commissariat général au développement durable. The very high values (1,563 €/ha/year on average in 2022³) cannot be implemented

¹ See "[Taxing veterinary antibiotics would reduce their use in livestock farming](#)", *Le Vif*, 29 September 2017; Van Boeckel T.P. *et al.* (2017), "[Reducing antimicrobial use in food animals](#)", *op. cit.*

² Ministry of Agriculture and Food (2018), "[Agricultural Statistics - Edition 2018](#)", *Agreste Mémento*, December.

³ The report shows an average value of €670/ha/year for all types and values for 2017. By discounting with the tutelary value of the carbon of 2022 we obtain 1,563 €/ha/year.

here, as they would encourage farmers to transform all their land into grassland, without loading conditions to the detriment of food production. Still, they stress the importance of the service provided by the prairies¹.

To propose a premium value for one hectare of permanent grassland, we use the 2009 Chevassus-au-Louis report², which presents more feasible values. The carbon fixation and storage service for grasslands is estimated at between €183 and €367 per hectare per year. In addition to these services, the regulation of water quality is estimated at 90 euros per hectare a year. The regulation services for permanent grassland could, then, be valued above 200 euros per hectare a year, with a maximum value of 457 euros per hectare a year. Knowing that it is planned to increase the value of the bonus according to the age of the grassland, this increase could be done within this range of values. Considering that the grassland still on farms represents 7,701,09 hectares³, this represents a total budget of €1.5 to €3.5 billion a year for France.

The diversification of production bonus

The budget allocated for crop diversification depends on the choice of each farm. All farms with arable land are likely to receive this payment, which varies per hectare depending on the diversity of crops measured by the Shannon index. Low crop diversity - characterized by a Shannon index of less than 1.58 - is not remunerated. Beyond that, the premium per hectare increases with the Shannon index. For example, a very high diversity (field crops grown in organic farming, etc.) gives a premium level of 300 euros per hectare. Assuming that all farms have a Shannon index higher than 1.58 (corresponding to a number of different crops higher than 3) and with 18 262 890 hectares of arable land on French territory, the total amount of this envelope would reach €2.4 to 5.5 billion for an annual premium per hectare range between €130 and €300.

¹ Commissariat général au développement durable (2019), *EFESE - La séquestration du carbone par les écosystèmes français*, Paris, La Documentation Française, Collection Théma Analyse, e-publication, March.

² Chevassus-au-Louis B. Salles J.-M. and Pujol J.-L. (2009), *Approche économique de la biodiversité et des services liés aux écosystèmes: contribution à la décision publique*, Centre d'analyse stratégique, *op. cit.*

³ Agreste Chiffres et Données Agriculture, n° 2019-4, June 2019.

The bonus areas of ecological interest

We count about 515,000 hectares of EIS in France (505,000 hectares of fallow land in France in 2018¹ and 10,000 hectares of hedges, trees and low walls on farms in 2010²). With a premium of 200 euros per hectare of EIS, this would represent a budget of 103 million euros.

The HVN and Natura 2000 premiums

These premiums would benefit from the current budgets already in place (EAFRD).

Table 4 - Estimate of the required envelopes for the three environmental bonuses

Bonus	Areas concerned (in thousands of hectares)	Amount of the premium (€/ha)		Total budget (€bn)	
		Minimal	Maximum	Minimal	Maximum
Permanent meadows	7 702	200	457	1,5	3,5
Crop diversification	18 263	130	300	2,4	5,5
Areas of ecological interest	515	200	200	0,1	0,1

Source: France Stratégie

3. A proposal for the distribution of the budget between the various aids

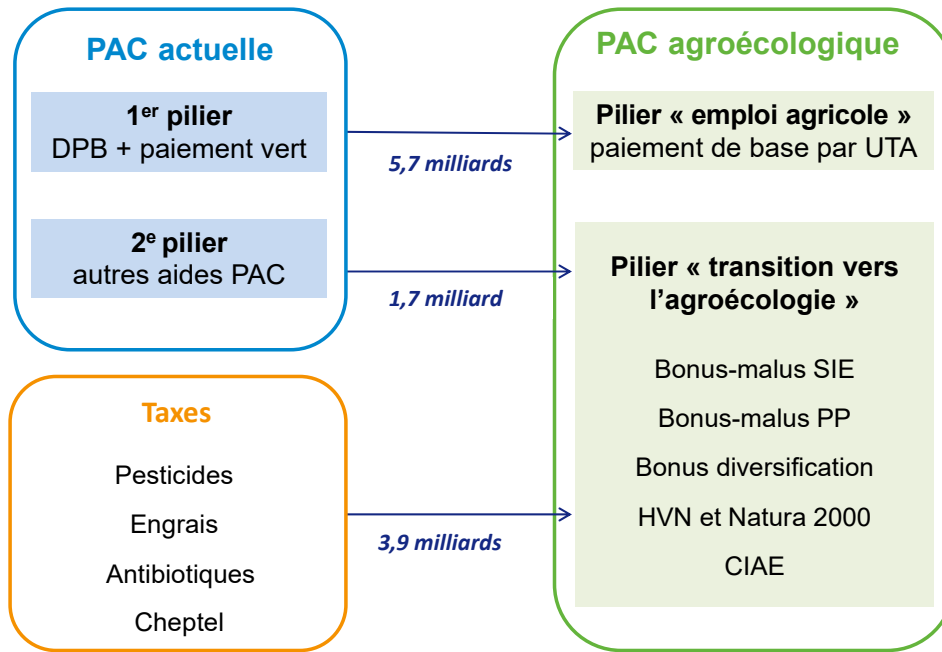
We propose a reorganization of the budget without increasing European contributions (see Figure 1). Some aid would be financed from the current CAP budget, and two would be financed by the taxes levied, the amounts of which depend on the tax rates chosen. The rates chosen should ensure that sufficient budgets are available to finance bonuses on permanent grassland and to diversify production. We do not take into account the aid not directly linked to the CAP from which farms can benefit (aid for methanisation, CICE, tax reductions, etc.).

¹ Agreste Chiffres et Données Agriculture, n° 2019-4, June 2019.

² Agreste - Agricultural censuses (RA) - Cultivation methods, landscape elements by canton - 2010 (last update 10/2018).

This figure shows that the CAP reform proposed in this report could be calibrated to achieve the desired budget level. This simplified assessment does not take into account the desired evolution of agricultural practices for the use of chemical inputs (fertilizers or pesticides). It would only be valid for the first years of implementation of the reform.

Figure 1 - Proposed distribution of the CAP budget



Our: the figures represent the amounts in billions of euros estimated at constant practices at the beginning of the reform. For taxes and bonuses, they vary according to the rates chosen. Beyond 2022, these amounts depend on the adaptation practices implemented by farmers.

Source: France Stratégie



CHAPTER 5

THE DIFFERENTIAL IMPACT ON FRENCH FARMS

The reform elements we propose can be implemented on all French farms, regardless of their structure and size. We first present the effects of these reforms from a qualitative point of view. The precise quantification of the effects of these reforms on the amounts of aid paid to farmers is difficult because it involves making a number of assumptions about the different amounts and tax bases proposed. This quantification is presented in a second step.

1. A qualitative analysis of the potential impacts of such a reform

It is possible to outline a qualitative analysis of the potential effects of these proposals (see Table 5). Thus:

- the bonus-malus on crop diversification would benefit farms that are already diversified, most often organic and polyculture-poly livestock farms, to the detriment of field crop farms;
- the bonus-malus on permanent grasslands would support extensive farming;
- taxes on pesticides and fertilizers would benefit ecological and organic farms;
- the tax on greenhouse gas emissions would impact livestock, particularly ruminants;
- bonuses for Natura 2000 and high nature value areas would benefit in particular extensive livestock farming, particularly in mountain areas;

Table 5 - Expected effects in terms of aid paid out by the proposed reforms on different types of agricultural holdings

	Plant production										Animal production											PolyCE			
	Conventional					Agro-ecological					Conventional						Agro-ecological					Cv	Ae		
	COP	GC	Arbo	Mar	Viti	COP	GC	Arbo	Mar	Viti	BVv ext	BVv	BVI ext	BVI	O-C	PC	VA	BVv	BVI	O-C	PC			VA	
Bonus for the diversification of production	-/0	-/0	-/0	-/0	-/0	+/0	+/0	+/0	+/0	+/0	0	0	0	0	0	0	0	+/0	+/0	+/0	+/0	+/0	+/0	+	
Bonus-malus for permanent grasslands	0	0	0	0	0	0	0	0	0	0	+	-	+	-	+	0	0	+	+	+	0	0	+/0	+	
Pesticide taxes	--	--	---	--	-	+/0	+/0	+/0	+/0	+/0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
Fertilizer taxes	--	--	-	-	-	-/0	-/0	-/0	-/0	-/0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-/0
Taxes on antibiotics	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	+	+	+	+	+	-	+	
Taxes on animal greenhouse gas emissions	0	0	0	0	0	0	0	0	0	0	--	---	--	---	-	-	-	--	--	--	-	-	-	-	
Bonuses for Natura 2000 and HVN areas	-/0	-/0	-/0	-/0	-/0	-/0	-/0	-/0	-/0	-/0	+	0	+	0	+	0	0	+	+	+	0	0	+/0	+/0	
Basic payment per AWU	-/0	-/0	+	+	+	+	+	+	+	+	0	0	0	0	0	+/0	+/0	+	+	+	+	+	+	+	

Legend: Ae : agro-ecological ; Arbo : arboriculture ; AV : poultry ; BVI : dairy cattle ; BVv : beef cattle ; COP : cereals and oilseeds ; ext : extensive livestock ; GC : other field crops ; Mar : market gardening ; O-C : sheep and goats ; PC : pigs ; PolyCE : polycultures-livestock ; Viti : viticulture.

Interpretation: 0 : a priori neutral effect of the reform proposal in relation to the current situation; + / 0 to +++ : slightly to very positive effect in terms of aid paid; - / 0 to --- : slightly to very negative effect in terms of aid paid.

Source: France Stratégie

- finally, the payment of a basic payment per agricultural work unit would make it possible to consolidate labor-intensive production, particularly fruit, wine and vegetable farms, as well as agro-ecological farms.

This reform would thus redirect CAP appropriations towards production systems which, a priori, offer the greatest number of environmental amenities, and contribute to maintaining agricultural employment.

2. A costing of costs and benefits for some typical cases

From a few typical cases, we illustrate the effects of such a reform for a few agricultural holdings of subsidies received. The rates used for the various taxes and bonuses have been chosen to illustrate the effects. Yet they do not constitute a recommendation for the calibration of the various instruments.

2.1. The method

Data from the INOSYS platform's typical farms - Livestock networks

To evaluate the effects of such a reform on French farms, we relied on characteristic data from "typical" farms provided by the INOSYS-Réseaux d'élevage collective platform set up in France by the chambers of agriculture and the Institut de l'élevage. These references make it possible to analyze the functioning of farms¹. This approach makes it possible to illustrate certain effects, but is not exhaustive because it does not cover all French productions or the different regions. We tested the effects of such a reform on four typical large-scale farms in the Centre-Val de Loire region² and on four dairy farms in the Normandy region (see Table 6).

¹ According to the [Institut de l'Élevage \(Idèle\) website](#): "INOSYS-Réseaux d'élevage is a central research and development infrastructure for the livestock industry. The system produces references and qualitative expertise essential for technical support as well as for prospective studies on the sectors. It also allows the construction and maintenance of expertise on livestock systems throughout the national territory, and a detailed knowledge of the functioning of livestock farms. Its many productions make it possible to simulate or evaluate the impact of public policies, regulatory changes, climatic risks or markets. »

² Inosys Centre-Val de Loire field crops, [2018 case histories](#).

Table 6 - Description of typical cases used

Type of production	Typical case number	System description	Location	Year
Field crops in the Centre-Val de Loire region	GC 1	80 to 180 ha, 1 UTH* - low agronomic potential	Loiret, Loir-et-Cher, Cher, Indre-et-Loire	2018
	GC 2	80 to 180 ha, 1 UTH - average agronomic potential	Centre region outside Loir-et-Cher	
	GC 3	more than 280 ha, 2 UTH - average agronomic potential	Dear, Indre	
	GC 4	80 to 130 ha, 1 UTH - medium agronomic potential - organic	The 6 departments	
Dairy cattle Normandy	BL 1	Breeding specialized in milk: grazier drying in barn AOP Norman race (2 UTH ; 113 ha)	All departments of the region	2018
	BL 2	Breeding specialized in milk: intensive in calves spread out in the Norman breed (1.5 UTH; 69 ha)		
	BL 3	Polyculture-rearing with intensive milk workshop in Prim'Holstein and extensive meat in Blonde d'Aquitaine (3 UTH; 182 ha)		
	BL4	Medium-scale polyculture-dairy farming in Prim'Holstein (2.5 UTH; 190 ha)		
Beef cattle	BV	Breastfeeding in high mountains (altitude between 800 and 1,500 m), currently recognized in areas with natural handicaps (1.5 UTH)	Alps and dry prealps	2017

* UTH: human work unit

Source: France Stratégie, based on Inosys-Réseaux d'élevage

The assumptions and approximations used

Based on the instruments to be modelled and the data actually available, we make a set of assumptions presented in Table 7.

Table 7 - Assumptions and approximations by instrument

Proposed reform				Modeling	
Target	Type of instrument	Modality	Necessary indicators	Available data	Assumptions and approximations

Employment	Payment of payment basic per annual work unit	-	Number of FTEs	UTH*	1 UTH = 1 FTE
Diversification of the productions	Bonus	Bonus for extension of rotations on a given plot	Shannon's Index	Rotation** and rotation	Proportion of individuals of species i among all cultivated individuals = share of crop i in the crop rotation
					Same seeding rate for all crops and plots
					No consideration of herd diversification here
Permanent meadows	Bonus-Malus	Bonus increasing according to the age of the grassland; malus if reversal	Grassland age; grazing density	Rotation* and rotations; loading	No transfer of the holding (whole or part of it) because the aid is granted for specific parcels
					Identical grazing density on all permanent grassland plots
					Same age for all permanent grasslands (average age 8 years)
EIS		Bonus if presence; malus if destruction-whose amounts depend on the impact on biodiversity	Indicators of impacts on biodiversity according to the different EIS	Set-aside areas only	All EIS have the same impact on biodiversity
Pesticides	Taxes	Rate increasing over time	Usage indicator	Operating expenses for phytos	Application of the same tax rate regardless of the product (herbicide, fungicide, insecticide) and on consumption in value terms
GHG		Rate increasing over time	Livestock size and nitrogen application	Livestock size	No tax modelled here on nitrogen spraying but fertilizer and eructation effects are taken into account in the LUM tax
Fertilizers		Rate increasing over time	Usage indicator	Operating expenses on fertilizers	Application of the same tax rate regardless of the fertiliser (N, P, K)*** and on consumption in value terms
Antibiotics		Rate increasing over time	Usage indicator	Veterinary expenses*	Share of antibiotics in fixed and identical veterinary costs regardless of the farm; tax on consumption in value terms
CIAE					
HVN					
Natura 2000					
Penalty coordinated control of the offer					Not evaluable here

* UTH: human work unit.

** Crop rotation data are not available for Normandy farms. We consider grassland areas to be permanent grassland.

*** N: nitrogen; P: phosphate; K: potassium.

Source: France Stratégie

Box 6 - Calculation of the Shannon index

The Shannon Biodiversity Index measures the specific diversity of an environment, that is, the number of species existing in a defined environment and the distribution of individuals within these species. Theoretically, the Shannon index (H') is calculated as follows:

$$H' = - \sum_{i=1}^S p_i \log_2 p_i \quad p_i = \frac{n_i}{N}$$

Avec :

i = une espèce du milieu d'étude

S = nombre d'espèces du milieu d'étude (specific wealth)

n_i = nombre d'individus de l'espèce i

N = nombre d'individus de toutes les espèces (effectif total)

This index must take into account all species in the study area. Here, to assess the diversity of crop rotation, we look at the different cultivated species. We approximate p_i by the share of culture i in the crop rotation, i.e.:

$$p_i \cong \frac{\text{surface de la culture } i}{\text{SAU hors prairies permanentes}}$$

The parameters¹

The premium amounts² are fixed for all simulations (see Table 8 and Table 9). However, we test two rates for each of the taxes (see Table 10). The "low" assumption can correspond to rates implemented in 2022, assuming that farmers have not yet had time to change their practices. The "high" assumption corresponds to higher tax amounts, which potentially penalize farmers more. Therefore, this assumption corresponds to a more distant horizon that allows farmers to adapt more easily (2025, for example).

¹ The parameters related to the new CAP are set at different values proposed in the literature.

² All bonus amounts are annual.

Table 8 - Premium amounts

Bonus	Amount
Basic payment per agricultural work unit (€/FTE)	8 000
Production diversification bonus (€/ha*Shannon index)	100*
EIS bonus (€/ha)	200

* If and only if H' ≥ 1.58 and SIE ≥ 5% of the utilised agricultural area (UAA).

Source: France Stratégie

Table 9 - Bonus amounts for permanent grassland

Grassland age (years)	6	7	8	9	≥10
Permanent meadows bonus (€/ha)	273	319	365*	411	457

* For the simulations, we consider that the age of the grasslands is eight years on average, and therefore, use only the amount of 365 euros per hectare.

Source: France Stratégie

Table 10 - Values of parameters used to simulate taxes under two assumptions

Taxes	Low hypothesis	High hypothesis
Plant protection products (% of price)	15 %	50 %
Fertilizer (% of price)	20 %	50 %
Antibiotics (% of price)	20 %	50 %
GHG (€/GBU)	62	80

Source: France Stratégie

Cost or benefit at constant practice (2022)

For each typical farm based on INOSYS network data (structural and economic data) as well as the levels of taxes and bonuses tested, we calculate the total amount received by the typical farm corresponding to the sum of premiums minus the taxes induced by the proposed reform:

$$\text{Montant total perçu(€)} = \sum \text{subventions perçues} - \sum \text{taxes prélevées}$$

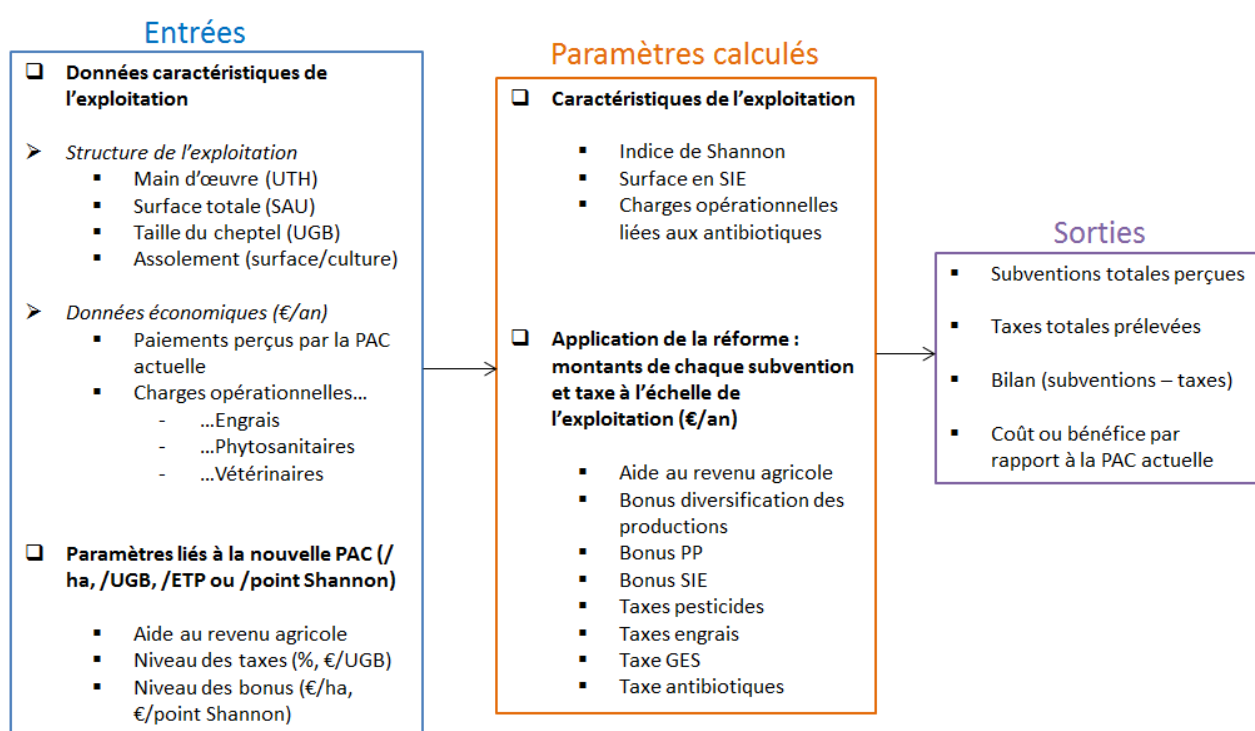
This amount is then compared with the total amount of aid currently received by the farm. We determine here - at constant practice - the impact in terms of subsidies received of the implementation of the reform in relation to the current CAP (see Figure 2).

The estimated cost or profit corresponds to a difference in subsidies received, and not to an economic performance indicator such as the gross margin, the gross operating surplus or the current result before tax. These indicators require an overall assessment of the operation that we do not do here because this would require data on yields and product prices.

Coût ou bénéfice de la réforme à pratiques constantes(€)

$$= \text{Montant total perçu} - \sum \text{subventions perçues avec la PAC actuelle}$$

Figure 2 - Application of the reform to typical farms with constant practices



* EIS surfaces here include only fallow surfaces and therefore no landscape elements such as hedges, buffer strips, etc.

Source: France Stratégie

Cost or benefit with change in practices (2025)

We assume that the reduction in the use of plant health products meets the goals outlined by the government for 2025, namely, a 50% reduction in use ([Ecophyto II plan](#)), and that this objective is achieved at the level of each farm. We are also considering a similar reduction in fertilizer use.

2.2. The main results

The results obtained from the various simulations are presented in Table 11. Note for the simulation of the change of practices, we only take into account a reduction in the use of fertilizers and pesticides in this table. Further gains can be achieved by diversifying production, introducing EIS (e. g. hedges), employing more labor or reducing antibiotics and extensifying¹ production in the case of dairy farms.

Table 11 - Summary of the results of the four simulations for all eight typical cases

Typical case number	No change in practices (2022)				With change of practices (2025)			
	Low hypothesis		High hypothesis		Low hypothesis		High hypothesis	
	Amount received (€/year)	Cost or benefit compared to the current CAP (€/year)	Amount received (€/year)	Cost or benefit compared to the current CAP (€/year)	Amount received (€/year)	Cost or benefit compared to the current CAP (€/year)	Amount received (€/year)	Cost or benefit compared to the current CAP (€/year)
GC 1	25 458	- 1 154	15 712	- 10 900	28 946	2 334	25 298	- 1 314
GC 2	30 181	1 456	14 871	- 13 854	34 490	5 765	26 835	- 1 890
GC 3	60 905	- 808	33 189	- 28 524	68 623	6 910	54 765	- 6 948
GC 4	36 322	12 004	35 122	10 804	36 722	12 404	36 122	11 804
BL 1	46 635	14 153	41 498	9 016	47 307	14 825	43 306	10 824
BL 2	25 111	5 160	19 691	- 261	26 198	6 247	22 727	2 776
BL 3	55 399	2 163	39 610	- 13 627	58 853	5 617	49 574	- 3 662
BL 4	50 668	- 5 822	34 198	- 22 292	54 269	- 2 221	44 600	- 11 890
BVRA	84 661	20 853	80 832	17 024	85 219	21 411	82 289	18 481

Reading note: "GC" symbolizes typical field crop cases and "BL" dairy cattle farms. Without changing practices, the type 1 field crop farm receives 25,458 or 15,712 euros depending on the tax rates chosen (high or low assumption). These amounts represent a loss of €1,154 or €10,900 compared to the total amount currently received. By reducing its inputs by 50%, the same farm reduces its taxes, which leads to a gain of €2,334 under the low assumption or a loss of €1,314 under the high assumption compared to the current situation.

Source: France Stratégie

¹ An extensification of milk production results in a reduction in loading, i.e. in the number of animals per unit area.

Winning" organic and grassland systems that can maintain their current practices

In field crops, one case study reveals a gain in total subsidies received for all simulations, that is, organic farming (GC 4). This gain is due to low input use and high crop diversification (Shannon index of 2.88). In livestock farming, two typical cases also show a gain for the four simulations, namely specialized grazing milk breeding (BL 1) and mountain livestock farming in the Alps (BVRA 05). The fodder system, based mainly on permanent grassland, allows significant bonuses to be obtained.

A necessary diversification for conventional field crop farms

Under low tax conditions, the three typical cases of conventional arable crops do not lose subsidies compared with the current situation if input use is reduced by 50%. Under high tax conditions, the 50% reduction in inputs is insufficient to obtain as many subsidies as in the current situation. Farms must further reduce their use of fertilizers, and plant protection products and/or further diversify their crops. For example, they make a gain when they diversify to obtain a Shannon index of 2 for GC 1, 2.50 for GC 2 and 2.25 for GC 3. This diversification increases the amount of premiums collected per hectare and then offsets the increase in taxes. The GC 4 type farm must make a greater effort to diversify than the other two conventional farms (+0.25 on the Shannon index against +0.12 and +0.15). This is due to two differences. Compared to GC 2, it receives fewer subsidies (per hectare) because of a lower labour force (per hectare), and lower diversification. Compared with GC 1, the amounts of gross subsidies per hectare are of the same order, but GC 3 is much less economical in inputs and more particularly in terms of fertilizer.

Adaptations also necessary for livestock farming

Regardless of the tax assumption, the BL 2 test case does not lose subsidies compared with the current situation by reducing its crop inputs by 50%. The high proportion of permanent grassland ensures high premiums for this farm. Even with high taxes, however, the cost is relatively low, and can be easily offset by reducing crop protection products and fertilizers.

In contrast to the BL 2 case, the BL 3 and BL 4 farms have a large cash crop workshop (about 100 hectares of crops). But the reform we are proposing values permanent grasslands much more highly than crops, even in the case of a diversified

crop rotation¹. This explains why by reducing crop inputs by 50% these farms are not necessarily able to obtain a gain. To offset the cost incurred, an additional possible adaptation for these two standard cases consists in diversifying production on their cultivated areas. The BL 3 case is a winner under low tax conditions, but must reach a Shannon index of 2.21 on its crops to obtain a net subsidy gain compared to the current situation. The BL 4 type farm must reach a Shannon index of 2.08 under low assumption and 2.74 under high assumption to win in subsidies.

In summary, this simulation shows that organic and grassland systems would be "winners" and could maintain their current practices. Diversification, however, would be necessary for conventional arable crops farms, which, under unchanged practices, could lose up to 46 % of their aid in the worst-case scenario (typical case of a 300-hectare farm). Adjustments would also be necessary for livestock farms, with those with permanent grassland favored over more intensive farms that could lose, under unchanged practices as much as 40% of their aid in the worst case, corresponding to an intensive dairy workshop.

¹ The premium for permanent grassland is 365 €/ha on average compared to 288 €/ha for very diversified crops (amount corresponding to the diversification observed for the typical case of arable crops grown under organic farming).



CONCLUSION

To meet the current challenges of agriculture, and to accelerate its shift towards a more resilient and sustainable model, the Common Agricultural Policy should be reevaluated according to the major principles of public economy that would help to reduce the administrative burden involved in its implementation. The application of these principles would facilitate a remodeling of the CAP based on two main types of instruments:

- horizontal measures that may concern all farms: the introduction of a basic payment per annual work unit; the taxation of pesticides, antibiotics, mineral fertilizers and livestock products; the remuneration for the maintenance and development of permanent grassland and areas of ecological interest; the creation of incentives for the implementation of insurance and prevention instruments;
- measures aimed at certain farms by voluntary groupings of farms engaged in the agro-ecological transition on the one hand; a bonus for areas of environmental interest (Natura 2000 areas and high natural value areas of the Green and Blue Trame) on the other.

This new structure could be implemented rapidly to respond to urgent needs for a transition in European agriculture, because of the environmental, and societal challenges it already faces.

These proposals fully meet the reform priorities laid out in the French proposal of December 2018:

- by emphasizing the common nature of the proposed agricultural policy, which includes only two optional mechanisms (the bonus for areas of environmental interest and the contract for agro-ecological innovation) and which generalizes a system of remuneration for farmers common to all Member States (the basic payment per agricultural asset) while retaining a distribution key between Member States of the CAP budget based on the useful agricultural area;

- by supporting the agro-ecological transition of food systems, by remunerating permanent grassland, areas of ecological interest and diversification of production, and by implementing the polluter-pays principle;
- by encouraging the diversification of production, which increases the resilience of farms and limits climatic, health and economic risks;
- by basing this reform on the coherent principles of the public economy and translating them into simple tools (bonus-malus), which increases the readability of the CAP.

This reform would not entail a fundamental overhaul of the current European regulatory corpus for most of our proposals. Yet the implementation of the basic payment per agricultural work unit may require an examination of the rules for the distribution of aid between Member States, and a thorough legal analysis. It could be done gradually by defining increasing rates of bonuses and malus using a previously defined trajectory to give farmers the time they need to develop their production systems.



APPENDICES



APPENDIX 1

Working Group Members

Presidents

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- **Pierre Dupraz**, Director of Research at INRA, SMART-LERECO Unit (Agricultural structures and markets, resources and territories - Laboratoires d'études et de recherche en économie)

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- **Gilles Bazin**, Professor Emeritus of Agricultural Policy and Development at AgroParisTech
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- **Hervé Guyomard**, Research Director at INRA
- **Sébastien Jean**, Director of Cepii
- **Jean-Luc Pujol**, biologist, chief engineer of bridges, water and forests
- **Aurélien Trouvé**, lecturer in economics at AgroParisTech



APPENDIX 2

Calculation of the amounts collected by fertilizer and pesticide taxes from the tax rates applied in other European countries

Target	European example	Tax rates on fertilizer prices	Total amount collected by the tax (M €)
Fertilizers and soil improvers	Finland	0,7	2 450
	Sweden	0,2	700
	Austria	0,59	2 065
Pesticides and agrochemicals	Norway	0,15	495
	Denmark (herbicides)	0,25	825
	Denmark (insecticides)	0,35	1 155

Source: France Stratégie, based on Marcus V. and Simon O. (2015), *Pollution by nitrogen fertilizers and phytosanitary products: costs and solutions*, Studies and documents n° 136, General Commission for Sustainable Development, December



APPENDIX 3

Calculation of the amounts collected by the pesticide tax from the rates associated with different levels of reduction the use of these products

Rate of reduction in pesticide use (%)	Associated tax rate		Total amount collected by tax (€M)	
	If taxation only	If associated with a redistribution to the AB	If taxation only	If association to a redistribution to the AB
20	0,16	0,05	528	165
30	1,01	0,31	3 333	1 023
40	1,38	0,6	4 554	1 980
50	1,82	1,38	6 006	4 554

Source: France Stratégie, based on Butault J.-P., Delame N., Jacquet F. and Zardet G. (2011), "L'utilisation des pesticides en France: état des lieux et perspectives de réduction", Notes et études socio-économiques, n° 35, Centre d'études et de prospective, octobre



APPENDIX 4

Calculation of the amounts collected by the pesticide tax based on two rates associated with two levels of use reductions defined by the Grenelle de l'environnement

Rate of reduction in pesticide use (%)	Associated tax rate	Total amount collected by the tax (€M)
25	0,35	1 155
50	2,1	6 930

Source: France Stratégie, d'après Femenia F. et Letort E. (2016), « How to significantly reduce pesticide use: An empirical evaluation of the impacts of pesticide taxation associated with a change in cropping practice », *Ecological Economics*, 125(C), p. 27-37



APPENDIX 5

Characteristics of typical farms

Case study	Field crops, Centre-Val de Loire				Dairy cattle, Normandy				Beef cattle Alps
	80 to 180 ha, 1 UTH - low agronomic potential GC 1	80 to 180 ha, 1 UTH - average agronomic potential GC 2	more than 280 ha, 2UTH - average agronomic potential GC 3	80 to 130 ha, 1 UTH - average agronomic potential GC 4	Breeding specialized in milk: grazier drying in barn AOP Norman breed BL 1	Breeding specialized in milk: intensive in calves spread out in the Norman breed BL 2	Polyculture-livestock with intensive milk workshop in Prim'Holstein and meat extensive in Blonde d'Aquitaine BL 3	Medium-scale polyculture-dairy farming in Prim'Holstein BL 4	Breastfeeding livestock high mountain BV RA
UTH	1	1	2	1	2	1,5	3	2,5	1,5
UAA (ha)	120	130	300	100	113	69	182	190	240
UAA excluding PP	111	130	290	100	7	36	127	144	40
UGB	0	0	0	0	96	57	90	97	94
Apparent loading (LU/ha SFP)	0	0	0	0	1,49	1,72	1,59	1,71	
Total CAP payments (€)	26 612	28 725	61 713	24 318	32 482	19 951	53 236	56 490	63 808
Fertilizer charges (€)	16 328	28 802	49 798	4 000	5 198	7 038	18 564	19 190	4 829
Plant loads (€)	13 850	19 055	36 504	-	2 034	5 106	21 294	22 420	1 000
Veterinary expenses (€)					7 584	3 306	7 650	7 469	2 255
EIS area (ha)	9	0	10	0	0				
EIS share in UAA	8 %	0 %	3 %	0 %					
Shannon's Index	1,88	2,35	2,00	2,88		1,92	1,92	1,92	1,67
<i>Rotation (ha)</i>									
Common wheat	41	42	142	21	7	18	100	108	
Barley	36	25	44	10					
Rapeseed	23	30	64	0					
Sunflower	12	8	12	0					
Durum wheat		17	18	0					
Prot pea		8	10	0					
Alfalfa				30					2
Beans	0	0	0	10					
Lens				12					
Triticale				5					8
Mixing Trit/Pea				6					
Mixing Barley H/Peas				6					
Corn silage silage						18	27	36	8
PT									12
Fallow land	9		10	0					
PP	0	0	0	0	106	33	55	46	200

Source: *France Stratégie*



APPENDIX 6

Detail of the amounts of taxes and subsidies applied for each typical case in the constant practice simulation under the assumption of low taxes

	GC 1	GC 2	GC 3	GC 4	BL 1	BL 2	BL 3	BL 4	BV RA
Farm Income Assistance	8 000	8 000	16 000	8 000	16 000	12 000	24 000	20 000	12 000
Production diversification bonus	24 814	30 564	58 140	28 834	–	6 912	24 384	27 648	6 664
€/ha excluding PP	188	235	200	288	–	192	192	192	167
Bonus PP	–	–	–	–	38 690	12 045	20 075	16 790	73 000
EIS Bonus	1 800	–	2 000	–	–	–	–	–	–
Pesticide tax	2 078	2 858	5 476	–	305	766	3 194	3 363	150
GHG Tax	–	–	–	–	5 952	3 534	5 580	6 014	5 828
Fertilizer tax	3 266	5 760	9 960	800	1 040	1 408	3 713	3 838	966
Antibiotic tax	–	–	–	–	758	331	765	747	226
Total subsidies (€/year)	30 801	38 799	76 340	37 122	54 690	31 149	68 651	64 630	91 830
Total taxes (€/year)	- 5 343	- 8 619	- 15 435	- 800	- 8 055	- 6 038	- 13 252	- 13 962	- 7 169
Total amount received (€/year)	25 458	30 181	60 905	36 222	46 635	25 111	55 399	50 668	84 661
Differential compared to the current situation (€/year)	- 1 154	1 456	- 808	12 004	14 153	5 160	2 163	- 5 822	20 863

Source: France Stratégie



APPENDIX 6

Glossary of terms

AB	Organic farming
AO	Association of producer organisations
CIAE	Contract for agro-ecological innovation
CICE	Tax credit for competitiveness and employment
PBO	Basic payment entitlements
DPU	Right to a single payment
FTES	Full-time equivalent
FAO	Food and Agriculture Organization
EAFRD	European Agricultural Fund for Rural Development
EAGGF	European Agricultural Guidance and Guarantee Fund
FMSE	Fonds national agricole de mutualisation du risque sanitaire et environnemental
FNGRA	National Fund for Agricultural Risk Management
GATT	General Agreement on Tariffs and Trade
GHG	Greenhouse gases
Ha	Hectare
HVE	High environmental value
IFT	Treatment frequency index
LTECV	Act ^{No.} 2015-992 of 17 August 2015 on the energy transition for green growth
EAW	Agri-environmental measure
DEA	Agri-environmental and climate measure
MSA	Agricultural social mutuality

NODU	Number of unit doses
CMO	Common Market Organisation
WTO	World Trade Organization
OTEX	Technical and economic orientation of agricultural holdings
PAAC	Common Food and Agricultural Policy
CAP	Common Agricultural Policy
PDRR	Regional Rural Development Programme
PEI-AGRI	European Partnership for Agricultural Innovation
PMTVA	Premium for maintaining the suckler cow herd
PP	Permanent meadow
EPS	Payment for environmental services
RCAI	Current result before taxes
FADN	Farm accountancy data network
NAPR	Net farm business income
SAFER	Land Development and Rural Settlement Corporation
UAA	Utilised agricultural area
STH	Surface still in the making
EU	European Union
UGB	Large bovine unit
AWU	Annual work unit
UTANS	Annual self-employed work unit
UTH	Human work unit



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