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# Biodiversity and agricultural systems in Europe: drivers and issues for the CAP reform

Xavier POUX (European Forum on Nature Conservation and Pastoralism)

## CONTRASTED VIEWPOINTS ON BIODIVERSITY WITHIN THE CAP

When assessing the role of the CAP for biodiversity conservation (for which *farmed landscapes* play a key role), actors have two opposing outlooks : some value the changes that have taken place in the CAP in the last 10 years, such as the decoupling of direct payments or the strengthening of cross-compliance; for others, these changes are too general and there is an urgent need for its instruments to be much better targeted at biodiversity loss and the conservation of farming systems and practices that favor biodiversity.

## TOWARDS A SYSTEMIC APPROACH OF BIODIVERSITY CONSERVATION

A critique of the CAP is difficult to separate from wider criticism of the industrialisation of agriculture and the whole food supply chain that took place from the 1960s onwards. The integration of farming systems, and singularly animal production systems, into wider agri-food complexes was a huge change. Biodiversity loss has been due to the competition between agrarian systems and regions. The CAP has supported this trend: before 1992, market regulation favored large commodity producers. From 1992 onwards, the central agent aimed by CAP are the managers of the farming system. But those exist in a wider socio-economic and regulatory context that influences their responses to a given policy signal.

## "DOING GOOD" RATHER THAN "DOING BETTER"

The instruments included in CAP2020 proposals that intend to deliver biodiversity conservation are inadequately implemented or poorly designed. A "doing better: producing more with less" approach is not enough, and might even be counterproductive if it is implemented in productive areas while marginal ones are devoted to afforestation. Biodiversity conservation requires "doing good" in *absolute* terms. It depends on the future of economically viable farming systems that conserve and manage semi-natural vegetation (saltus) for production purposes. Biodiversity is compatible with maintaining a high level of agricultural activity and innovation in biodiversity-friendly farming systems, provided the incentives and supports given by the CAP and other policies are consistent and well targeted.

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☆☆☆

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# Biodiversity and agricultural systems in Europe: drivers and issues for the CAP reform

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## LIST OF ACRONYMS

| | |
|---|---|
| AEM | Agri-Environmental Measures |
| CAP | Common Agricultural Policy |
| CBD | Convention on Biological Diversity |
| EC | European Commission |
| EEC | European Economic Community |
| GAEC | Good Agricultural and Environmental Conditions (in the Cross-Compliance policy) |
| GATT | General Agreement on Tariffs and Trade |
| HNV | High Nature Value |
| SNV | semi-natural vegetation |

# 1. FOSTERING A BETTER UNDERSTANDING OF WHAT IS AT STAKE IN THE EU DEBATE ON BIODIVERSITY AND AGRICULTURAL POLICY

## 1.1. The purpose of this document

This document mainly addresses two types of readers:

- Those who are mainly concerned with biodiversity conservation, and who seek a better understanding of the socio-economic processes at play in agricultural change.
- Those who enter the CAP reform debate with a broader perspective and who want to push EU agriculture onto a more sustainable path, but also, as part of this aim, hope to achieve a better understanding of the nature of biodiversity conservation (and why conservationists are still not satisfied after 20 years of efforts for "sustainable development").

The document serves as a synthesis and is thus in many aspects mainly descriptive. Nevertheless, it aspires to add value to the debate by providing a holistic view which may facilitate the clarification of two different aspects of biodiversity integration into the CAP:

- What should be the objectives of such an integration and at what level should they take place? What are the specific needs of biodiversity compared to other environmental themes? To help answer these questions, the report sets out to clarify the nature of the relationship between agricultural change and biodiversity in Europe.
- What are the policy needs, in the CAP and in other EU policies, in terms of instruments, budgetary distribution and overall structure? The intention is to explain why "doing better for the environment" is not enough and to give pointers towards a more efficient set of policies for biodiversity conservation.

The document is then organised into three parts. The first sets the framework by analysing the relationship between biodiversity and agriculture in different types of agrarian systems over time. The second mobilises this framework to build a narrative of the co-evolution of the CAP, EU agrarian systems and biodiversity, in three distinct time periods (1970-1992; 1992-2007; and 2008-2012). The third part draws some conclusions and puts forward a vision for the efficient integration of biodiversity into the CAP, a vision which we intend to be relevant not only for the current discussions (CAP2020), but also for subsequent reforms.

## 1.2. Two visions of the problem

The two decades since 1992—the year of both a major CAP reform and the signing of the CDB—have made it clear that addressing biodiversity conservation in Europe needs to involve the CAP.

Assessing the role of the CAP in biodiversity[1] loss is not easy, not least because the causal relationship between various policy signals and changes in farming systems are complex and continuously changing. Furthermore, the present state of biodiversity is to a considerable extent the result of factors at play in *previous* years.

Within the CAP policy debate, those actors for whom biodiversity is or should be on the agenda have one of two broad outlooks:

1. In this document, "biodiversity" refers to biodiversity as linked to farmed landscapes. It should be recognised that other land uses, notably forest, remain paramount for biodiversity conservation in Europe. However, we assume that biodiversity that depends on agriculture is the main challenge for Europe and that it can be analysed independently.

- The first tends to value the changes that have taken place in the CAP in the last 10 years, and especially since the Agenda 2000 reform. The decoupling of direct payments, so that they no longer directly incentivise intensification and give freedom to the farmer on the one hand, and the strengthening of cross-compliance on the other hand, are the two main components of this line of argument. The champions of this position argue for the continuation of these policy directions and defend the same overall approach in the current reform, notably in the form of the proposed "greening". Their view is based on the assumption that through these policies, European agriculture is becoming ever more efficient, while permanent grasslands are nowadays better protected than ever. The official rationale of the proposed 2014-2020 CAP produced by the EC is a good example of this vision.
- The second view is that the changes made in the CAP are too general and inefficient and that there is an urgent need for its instruments (the GAEC and AEM in particular) to be much better targeted at biodiversity. While the advocates of this position may acknowledge that the overall policy framework is moving in the right direction in principle and does offer some opportunities (cross-compliance and AEM again, but also, for example, payments for areas under "natural constraints"), they consider that the CAP as a whole suffers from a "blanket" approach that does not address biodiversity conservation effectively. Decoupling might be neutral, for instance, but this is not enough to conserve important habitats—the proponents of this view see a need for positive rewards for farmers who properly manage such habitats. This vision is the one defended in a recent IEEP report (Poláková *et al.,* 2011).

## 1.3. An agrarian systems analysis

This report assumes that there is an analytical gap between these two visions; failure to bridge this gap limits the understanding of what is at stake in the CAP reform debate.

The CAP has moved from market regulation—which was the approach prior to 1992, when commodity prices were supported—to micro-economic regulation, in which the central agent is the manager of the farming system. It is this micro-economic vision which underlies the first ("mainstream") vision. The expectation of progress towards better environmental management is based on the assumption that decoupled payments give a signal to the farmer as an individual decision maker—while the coupled payments might have led to over-intensification, which has caused huge biodiversity loss, decoupling removes the incentive to go beyond a reasonable balance of profit and costs. Cross-compliance and AEM—and "green payments" in the upcoming CAP—should help to give further impetus in the right direction.

This view certainly has a grain of truth, but it exhibits a lack of understanding of many key drivers in farmers' decision-making processes; farmers are not isolated agents but exist in a wider socio-economic context that influences their responses to a given policy signal. Crucially also, this outlook fails to appreciate that cross-compliance linked to decoupled payments cannot be the basis of biodiversity conservation policy in the CAP: firstly because the 'thou shalt not' approach of cross-compliance is not appropriate to many situations. How can a CAP achieve its goals when it says to farmers: 'you must continue farming, even though it is uneconomic', if these goals include maintaining the agricultural use of that land? Secondly, because its level of playing does not permit cross-compliance to set appropriate standards for biodiversity conservation.

The limits of the micro-economic model when it comes to analysing the CAP are well recognised by the promoters of the second vision. To them, it is clear that biodiversity loss has been due to uneven competition between agrarian regions and that biodiversity conservation should therefore be based on the concentration of instruments and payments on the farming systems of regions that still are biodiversity-rich.

Focusing on these regions—the HNV areas, to anticipate what will follow in the report—does indeed set relevant territorial priorities for biodiversity conservation, but it might lead to a way of thinking in which the other regions (the dominant ones, in fact) could say that biodiversity is "none of their business". To us, this highlights the need to improve understanding of the relationship between the different regions and areas of Europe, even from a biodiversity conservation issue. A core example that we develop in this document is that of the extensive livestock sectors, which are now more and more dependent on bought-in feed produced in intensively farmed regions and on fattening systems located in those same regions.

This document therefore proposes an agrarian systems analysis of the development of European agriculture, with a focus on biodiversity issues. It concentrates on two main issues that we consider to be underemphasised in the policy debate, namely:

- the interrelationships between agrarian systems;
- the non-policy drivers, whose relative influence is increasing as the signal given by ever more decoupled CAP payments decreases.

The main objective of the report is to provide an analytical framework to help assess the relative role of the CAP amongst the different forces at play, whether in the past, the present or in the perspective of the CAP2020 proposals. It aims to show that, when considered within this wider context, it is clear that biodiversity conservation is not properly addressed in the CAP2020 proposals, and not only because the instruments that might deliver biodiversity conservation are inadequately implemented (e.g. AEM) or poorly designed (e.g. the "green payments"), but also because the overall CAP structure and its rationale seem, in combination with other forces, to favour those paths of change which are destroying biodiversity.

### 1.4. A holistic historical approach

Many of the debates on the impact of such a tool in the CAP are couched in absolute terms. For example, and crucially for our own debate here, the assumption that "decoupling is good for biodiversity conservation" is frequently presented as a self-evident truth, implying that conversely, "coupled payments are bad for biodiversity". However, our understanding is that the impact of decoupling depends very much on other factors such as commodity prices, the dominant pattern of agricultural change and the rules and conditions attached to the payments, not to mention the farming systems to which the payments apply. The same complexity applies to many instruments, including cross-compliance and many 2nd Pillar measures.

This leads us to adopt a holistic approach to the co-evolution of (i) the CAP, (ii) the agrarian systems and (iii) the set of other factors (such as commodity markets or the organisation of the food chain, to give but two examples). We assume that a historical approach is a good way to highlight the relationship between these three groups of factors and the way they change over time. We also assume that a certain degree of hindsight is necessary to understand the impact on biodiversity conservation, since the results of the processes at play emerge over several decades.

For our purposes in this report, we divide the history of the CAP into three main periods:

- 1960s-1992: the early CAP. This period is critical, since it shaped the mainstream development model for European agriculture and also shaped the overall distribution of CAP expenses between the "old" Member States (a pattern which is hard to change, even 20 years later) and the structure and balance of the CAP into and between its two pillars. It was the overproduction and the environmental impacts that took place in this period which led to the 1992 CAP reform and a legacy that is still very much alive in today's debates.
- 1992-2007: a period broadly characterised by low commodity prices and during which, therefore, a certain form of convergence between environmental, including biodiversity, and agricultural objectives might be thought to have occurred in the CAP reform process, albeit in a somewhat ambivalent way. This period also saw the enlargement of the EU to 27 Member States.
- 2008-2012: a much more hectic context for the CAP, one characterised by price hikes and volatility on the commodities front and a wider financial and economic crisis. During this period, the environmental policy context also evolved, with the urgency of biodiversity conservation being at the same time more apparent in the list of priorities and, paradoxically, more and more questioned, and sometimes being blurred in the design of dedicated policies.

## 2. UNDERSTANDING THE RELATIONSHIP BETWEEN AGRICULTURE AND BIODIVERSITY IN EUROPE: AN AGRARIAN SYSTEMS PERSPECTIVE

### 2.1. Understanding that the core of European biodiversity is managed by farming: semi-natural vegetation (*saltus*)

To fully comprehend the relationship between farming and biodiversity in Europe one must take into consideration further peculiarities, the roots of which lie in Europe's geography.

The general east-west orientation of the main European mountain chains (the Alps, the Pyrenees and the Carpathians) means that they acted as a wall preventing the southern migration of endogenic species during the last glaciations (ending circa 10,000 BP). Ice ages thus cleared the continent of a great deal of its wild heritage, both flora and fauna. The glacial retreat broadly corresponded to the progressive settlement of Neolithic agricultural civilizations. Thus, unlike in some other parts of the world, the development of agriculture took place alongside the wild recolonisation of space in much of Europe. We conclude from this not that agriculture should be considered as a natural use of space (slash and burn and ploughing are not "natural"), but that at the pace at which the development of farming took place in this particular

edaphic-climatic and human context,[2] there has been enough room and time for the selection and co-evolution of species to take place in a way that is linked to farming. Agriculture in Europe has considerably modified ecosystems and communities of species, but its development has been such that a certain species richness has been maintained and even boosted, based on a natural-like (hence, *semi*-natural) functioning of ecosystems in terms of nutrient cycles and species interactions and their complexity.

The need to close these cycles at the agro-ecosystem level, managed by a farming community, entails the need for a certain proportion of farmland to be maintained as permanent vegetation (pastures, meadows, scrubland, woodland) which acts as a nutrient source from which nutrients can be transferred and used in the cropped areas (which are nutrient-exporting), mainly, in practice, through animal manure. This was how agriculture worked until the agricultural revolution of the late 19th century, a revolution which became universal only some 60 years ago.

This puts the biodiversity conservation issue into its wider context, and especially allows us to see SNV as a fundamental feature of agricultural systems: these areas of permanent vegetation—or, more meaningfully, these *unploughed* plant communities—have been selected by farming over time to be a nutrient source, fundamental to a low-input agricultural system based on natural processes and indigenous species. This SNV might make up a different proportion of farmland in various farm types as we will see, but it is the backbone of the large part of European biodiversity which depends on agriculture. From an agrarian perspective, this SNV forms the *saltus* of rural geography — that can be rapidly defined as the uncultivated land used for grazing from the Roman ages —, spatially and functionally combined in rural landscapes with *ager* (cropped land), *hortus* (gardened land) and *silva* (woodland).

## 2.2. Clarifying the objectives for biodiversity conservation: what are the needs?

This reminder of how we got to where we are also helps to clarify the objectives of biodiversity conservation policy. It emphasises the concept that a minimum amount of SNV/saltus, which provides a habitat for indigenous species, is not just a key characteristic of HNV landscapes, but an absolute necessity for meaningful biodiversity conservation in agricultural landscapes.

It is important to note a common fallacy concerning the relationship between biodiversity and pollution. While pollution does indeed alter the semi-natural characteristics of saltus so that the number of species present drops with the level of inputs (nutrients and/or biocides), with downstream effects on other habitats (water, adjacent parcels), the reverse is not always true. A reduction of pollution does not necessarily result in a high number of species, for example when it occurs in landscapes with a low share of saltus and/or where the "reduced" level of pollution is still in excess of that which would allow the development of a diversified vegetation structure. Biodiversity conservation is demanding: it needs both a certain share of saltus—while leaving some space for ager—*together* with low inputs, simultaneously and in the same place.

This allows us to understand why, for example, the green payment requirements[3] proposed for the next CAP do not address the needs of biodiversity conservation head-on, even though, as their name implies, it is this objective that is used for their justification. From a biodiversity perspective, these requirements are lacking in key areas: they allow permanent pastures to be fertilised; they do not consider the possibility that the expected input reductions from crop diversity may be insufficient to deliver the necessary goals; and that SNV may not be maintained as the ecological focus. Even though the requirements are individually necessary, as presently formulated they are not sufficient, even taken together. "Going in the right direction" on separate components of agro-ecosystems—pastures, cropland and landscape features in this case—is not enough if the result falls short of enhancing SNV. And going beyond the example of 'greening' payments, we see the same deficiencies in any wider project which assumes that "efficient" farming in and of itself delivers the fundamental ecological requirements of biodiversity conservation.

In addition, it is important to have a dynamic understanding of biodiversity conservation. Many HNV agricultural landscapes have radically changed over the past centuries, meadows have replaced formerly cropped land, and vice versa. The conservation of biodiversity does not by any means imply the freezing of landscapes and the fossilisation of farming systems. The key goal

2. Aridity combined with historically higher population densities has made the fate of the Fertile Crescent rather different.

3. Crop diversification, maintenance of permanent pastures, minimum of landscape elements (ecological focus areas).

is not to keep any particular landscape element unchanged, but to retain an amount of SNV that is sufficient to host plant and animal communities and to ensure that the pace of change is slow enough to allow co-evolutionary processes to take place. If HNV landscapes have to be protected from the mainstream agricultural development pattern, it is because this pattern takes place at a dramatic speed and does not leave enough room for saltus (or *any* saltus, in some cases).

## 2.3. The place of saltus in the agrarian systems of the 1960s: a biodiversity reference frame

One of our purposes is to improve understanding of the development of EU farming and its impact on biodiversity. The early 1960s appear to be a relevant starting or reference point. It is the period during which the modern agricultural revolution impacted on Europe and its biodiversity and also the one in which the CAP was set up.

Given our analysis above, saltus—the extensive pastures and ligneous habitats from which biomass is exported for food, fibre and housing materials—and the way it interacts ecologically with cultivated areas (ager) can be proposed as a key indicator for capturing biodiversity issues at the broad scale. Using this touchstone, different kinds of European agrarian systems can be distinguished in different geographic contexts, using the following typology as detailed in Table 1 (while recognising that this is a somewhat simplified picture).

Livestock systems could have a dominant orientation, towards dairy or meat, but the degree of specialisation was nothing like it is today. Dairy systems had a certain meat component—most dairy breeds had certain dual-purpose qualities—and while the milk production per cow was lower (see below), the relative number of young animals (heifers, calves) available and able to use the saltus was higher. Finishing systems were often grass-based.

**Table 1.** A typology of European agrarian systems in the 1960s

| Geographic context | Agrarian system type | Main features | Usual size of farm | Type, place and function of saltus (SNV)/ager |
|---|---|---|---|---|
| Highly productive areas: good soil and climatic conditions (lowlands) | Intensive mixed, livestock oriented | Productive dairy (beef) grass based + crop complement | Small - medium | Saltus: productive grassland, dominant in landscape. Ager also productive. |
| | Lowland intensive crop | Productive crop farm + livestock complement (sheep, beef) | Medium - large | Ager very productive. Grassland in some parts of the landscape (wetlands, poor soils) |
| Medium productive areas: average soil, no major limitations due to sloping terrain (lowlands) | Lowland mixed: livestock & crops | Mixed livestock & crop systems, average yields | Small - medium | Share of permanent grassland and cropland + wooded features. High diversity in ager/saltus balance |
| Low productive areas: some limitations due to soil and sloping terrain (hills, mountains) | Hills/uplands mixed | Mixed systems with some livestock specialisation (dairy, beef, sheep) | Small - medium | Mainly permanent grassland + some scrub on poor soils. Ager on best land, some long rotations ager/grassland |
| | Mountain livestock (including in Med. area) | Mainly livestock systems (dairy, sheep), some subsistence crops | Small - medium | High diversity of saltus types: grassland, shrub, alpine pastures, wooded pastures + ager on best land |
| Mediterranean areas: highly variable, water availability limiting factor | Mixed crop (e.g. coltura promiscua) | Highly diversified crop systems + trees | Small | Mainly ager and hortus, saltus mainly off farm (on poor soils) + transhumance |
| | Pastoral | Extensive livestock systems (sheep, goat) | Small, but large area might be grazed off farm | High diversity of extensive saltus types, with limited share of grass |
| | Permanent crop (vines, olive, fruits...) | Mainly permanent crops, with some livestock | Small - medium vs. very large (latifundia) | Saltus (grazed) found under tree plantations, frequently associated with ager |
| Arctic area: soil and climate constraints | Pastoral | Extensive livestock systems (reindeer) | Off farm grazing | Mainly ligneous saltus (heather, etc.) |
| All areas, with proportion depending on social context | Subsistence | Mixed systems crops + gardens + small livestock | Small (even very small) | Mainly hortus and ager, saltus mainly off farm (in poor grazing land) |

Source: Author.

It should be noted that in this period, types of saltus were found in most of Europe's agricultural areas, even in what are today's specialised arable regions. Moreover, saltus was mostly exploited in a way which complemented arable farming, contributing fertility through the transfer of manure. The trinity of crops/pastures/livestock which is the basis of European mixed systems and some of which is now associated with Type 2 HNV farming systems ("low-intensity farmland with a mosaic of habitats and/or land uses" (Andersen 2006)) was the dominant pattern for European farming, while so-called Type 1 ("farmland with a high proportion of SNV") was found only in pastoral systems. In fact, areas that we may today think of as having been devoted to grassland for centuries (e.g. in the Atlantic or humid mountains zones) were sometimes rotated with crops during this period.

Although it cannot be fully demonstrated and documented, one can assume that most of Europe's farmed countryside was of HNV, and that some diversified semi-natural and landscape features were present almost everywhere and that the use of synthetic fertilisers and biocides was still unusual. Local long-term records of bird and butterfly populations, for example, strongly support this assumption.

It should be stressed that livestock is a central feature from both farming and biodiversity perspectives in the above typology:

- For farming: for as long as the use of synthetic nitrogen remained low, livestock (alongside legumes/protein crops in the ager) was the main source of nitrogen in the system. Manure was a sought-after resource, a set of specific practices ensured that it was transferred to arable land. Since, in most places, crops were the outputs in highest demand, manure was dedicated to growing them and there were no fertilised pastures in such systems. At a more detailed level, differences can be found between systems in which the saltus is the main source of fodder (e.g. upland, mountain and pastoral farms, as shown in Table 1) and systems in which a part of the ager is used for fodder (legumes, roots/beets, oats, etc.). On these latter farms, ager thus started to take over the role of saltus, allowing a kind of agronomic and ecological intensification; most lowland systems followed this model.
- For biodiversity: the vast majority of semi-natural habitats/saltus stood—and still stand in some places—on a delicate knife edge between sustainable use and overgrazing. Nonetheless, the greatest share of biodiversity linked to agriculture depended, and still depends, on extensive livestock used for the management of unfertilised saltus.

## 2.4. Understanding 1960s European agriculture diversity and intensity—the livestock issue

It is important to note the diversity of European farming in terms of biodiversity richness—not all parts of Europe were equivalent from this perspective—and also in terms of productivity and farm structures.

Considering the structural aspect, a first distinction can be made between Western (what was later to become known as the EU15, plus Malta and Cyprus) and Eastern Europe (the remaining Member States; we exclude non-EU countries from our analysis since we focus here on the CAP). In the West, the medium size farm (c. 10-20 ha) was the main player: its "natural" development path seemed to entail a progressive increase in size, together with a decrease in the labour force as workers left agriculture to obtain employment in industry and services. In the East, economies were under Soviet influence, leading to the emergence of two main types of farm structures: very large state/collective farms that covered hundreds of hectares (the process of size increase was not an economic matter *per se* but mainly an administrative process); together with very small subsistence farms, with very little ability or opportunity to develop. This duality and the relative lack of medium-sized farms in the East is still at play today, although there are huge differences from one country to another, for example between the Czech Republic where very large cereal farms were, and still are, dominant and Poland, in which small farms are the dominant type. This initial difference between Member States, which is rooted in the legacy of the 1960s, has been perpetuated to the present day and explains some of the different interests of these countries and their positions towards the CAP in today's policy debates (see for example Figure 7).

It should also be noted that while the use of fertilisers and biocides was limited (except in the Netherlands) and mainly occurred in large farms (capitalist and state/collective in the West and East respectively), differences of intensity based on cropping systems (legumes, roots and beets) and livestock density still led to huge differences in productivity across Member States. While in the Netherlands an average dairy cow yielded around 4 tonnes of milk/year, in France it was only half of that (Limouzin, 1996) and just 1.5 tonnes in Italy.

In the absence of synthetic fertilisers, the overall performance of European agriculture was limited to and by its two sources of nitrogen: permanent grassland/pastures (saltus) and cultivated protein crops (ager). While the latter yields around four

times more than the former (based on French figures from Duc *et al.*, 2010), given that the saltus occupied a much larger area, it can be assumed to have been the main source of nitrogen overall. The balance between crops and livestock was determined by these constraints which, in turn, had a knock-on effect on consumption patterns, with the share of dairy/meat products in the diet reflecting the overall agronomic balance. For obvious reasons, this balance between agriculture production (constrained by nitrogen) and population was something long-standing and fundamental: the European population could not exceed that which could be supported by the supply of food (ignoring, for the sake of simplicity, cereals imported from third countries—North Africa and the US—which were not significant overall) and its level has followed agronomic progress through time—undergoing changes that were mainly related to the amount of ager.

**Table 2.** Use of nitrogen in selected Member States, 1950

| | Nitrogen kg/ha |
|---|---|
| The Netherlands | 166 |
| Germany (West) | 51 |
| UK | 35 |
| Denmark | 30 |
| France | 15 |

Source: After Limouzin, 1996.

In 1960, this type of agronomy fed 600 million Europeans:[4] according to FAO statistics for 1961, European citizens had on average around 3,000 calories each day (this was true of every country except for Albania). Some trade between regions within Europe did exist, with two blocks: West (in which France was the main cereal producer/exporter from the 1960s onwards) and East (in which the USSR was the main exporter until the early 1970s). Lowland productive systems and specialised permanent crop systems (wine, fruit) were the main exporting sectors.

It should be remembered that during this period, consumers mainly had access to lightly-processed products that needed to be cooked at home or in restaurants. Processed food, in the style of the US market, hardly existed. In addition, most retailers had small shops; supermarkets were generally in their infancy in Europe, unlike on the other side of the Atlantic.

But the system was fragile and a certain amount of the demand, notably for livestock products, could not be met. Although starvation was no longer to be the fate of Europe, access to food remained unsatisfactory. Moreover, WWII had disrupted production, leaving Western Europe dependent on US cereals and meat product imports from 1945 to the 1960s.

4. Including the European part of Russia. The case of the UK as an importer should be investigated, but it does not change the overall reasoning.

## 3. A HISTORICAL PERSPECTIVE: THE CAP, EUROPEAN AGRICULTURE AND BIODIVERSITY

The vast majority of the agrarian systems described in Table 1 have undergone massive changes since the 1960s, as described in the following pages. Nevertheless, we consider that the ten types of agrarian systems identified are legitimate categories whose development can be used to illustrate change over time. The content and relative size of the ten systems might have changed, but the categories themselves are still relevant for organising the analysis.

### 3.1. 1960s-1992: setting the productionist agricultural model

This section focuses on the changes that occurred in the EEC (of 6, 9 and 12 Member States) and the future EU15 area. The reason for this emphasis is that most of the available information is related to this area and also because the CAP has historically been designed for and influenced by the Member States of this large region. In contrast, for the Central and Eastern European countries the two main features of this period are the continuation of a dualistic type of agriculture (large state/collective farms implementing industrial agriculture, with various performance and management failures, and small subsistence farms) and, as became apparent following the fall of the Berlin Wall, the backwardness of the agri-food industry and retailing structures in these countries.

#### 3.1.1. Setting the CAP: objectives and instruments

Our purpose here is not to recount the entire history of the CAP but rather to highlight its main features and origins. The need for a common agricultural policy stemmed from the post-war situation. Western Europe saw itself as under threat from the Soviet bloc and politicians identified the need to rebuild its economy as the top priority. Agriculture had to play its role in different ways:

- 1. by providing abundant and affordable food to the whole of society;
- 2. by freeing up the labour force, allowing it to go into the industrial and service sectors.

Contrary to what is sometimes said, the pre-1992

CAP objective was not the maintenance of high commodity prices for EEC farmers. The initial concern was the high gap between world and EEC prices and the inability of European farmers to cope with low prices and volatility, while at the same time responding to the need to modernise their farms. But at the same time, European prices could not remain too high for economic and social reasons (cheap food facilitates wage restraint). The compromise was to plan a smooth decrease in commodity prices over time: smooth in recognition of the farmers' needs, a decrease to meet the needs of the rest of society.

At that time, the main instruments used could be characterised as counter-cyclical payments for exported products: cereals, dairy products and beef, protecting the European market from the rest of the world ("Fortress Europe"). Note that the Kennedy Round within the GATT negotiations between the European Community and the US made an exception for the US soya bean (1962) and corn gluten feed (1967), allowing them to compete with cereals in the animal food market from then on. The cost of the CAP was determined by the product of (a) the gap between the world and the agreed European domestic price and (b) the volume exported. The CAP only came into play when some products were exported, but that support had a knock-on benefit for the entire farming community.

### 3.1.2. Modernising European agriculture: the productionist model

While the CAP offered a favourable economic climate for modernisation, and had been designed for this purpose, it was mostly other drivers which led to agricultural change. In particular, the technological models to foster were clear for all to see. Though the picture of European agriculture in the 1960s outlined above highlights, quite accurately, its predominantly pre-industrial characteristics, it was nevertheless the case that in the UK, Germany, France and pre-eminently in the Netherlands, farming systems that used fertilisers and machinery, which would be seen as the pioneers of modern agriculture, were already in existence. The goal set for European agriculture was simply to make this the general norm for all farms, producing as a desirable side effect a decrease in the agricultural workforce. This process took place in both EEC and non-EEC countries (e.g. Austria), though at a higher rate in the former. After the War, industry and machinery manufacturers were eager to supply inputs (fertilisers, biocides) to the European market. Parallel improvements in the transport sector, not least refrigeration for dairy products, allowed longer supply chains to develop across Europe.

For our purpose, it is useful to delve a little further into the nature of the changes that took place during this period, focusing on two levels of analysis: the farming system and the agrarian system.

### 3.1.3. Modernisation at the farming system level: more production and more costs

The smooth but continuous decrease in commodity prices (at least in relative terms) gave farmers the choice of whether or not to continue to maintain their incomes: either by (i) increasing production to make up for the reduction in income and/or (ii) reducing costs or (iii) abandoning farming. For the majority of farmers in the 1960s, there was no room for cost reduction, since the levels of inputs they used were relatively low. The obvious option then was to increase production (i) or, if that was not feasible at a sufficient scale, to give up farming (iii). Note that labour reduction (iii) can be achieved when a large farm replaces an employee with a machine.

An increase in production (i) was possible through one of two mechanisms:

- 1. an increase in the yield per hectare/head, generally by the use of more inputs, thus entailing variable costs;
- 2. an increase of the yield per farmer: more hectares or more heads of livestock per labour unit. Such an increase necessitates larger machinery and buildings whose fixed costs need to be covered by the rise in output, variable costs per unit of output at the same time being reduced. This mechanism can be measured by the increase of the average size of farm or, more precisely, by the number of labour units per ha and/or per head of livestock.

In the early period of the CAP, both of these mechanisms were at work. Developments in animal and plant breeding and the use of inputs led to a dependable, steady increase in production. Increasing variable costs, while at the same time incurring ever heavier fixed costs, was the expected indicator of modern farming, and indeed led to the improvement of many farming techniques. And increasing those fixed costs led inevitably to an attempt to further increase production in order to optimise the return on the capital invested.

In the early period of the CAP described here (1960s-1992), the two mechanisms went hand in hand: production rose regularly, as did the average farm size.

It is important to note that increasing farm size leads to specialisation—the management of several large units tends to be complicated. Farmers tend to minimise the time spent on some of their tasks through the use of more inputs—for example, buying in animal feed, even if it is actually

quite expensive when considered in isolation—in order to maximise the size of their main unit and thus, the optimisation of their fixed costs. Simplification is thus the inevitable trade-off for the increase in farm size; one which also tends to entail more variable costs. Edgar Pisani, the French Minister of Agriculture in the early 1960s and a "father" of the CAP, recently declared that when he designed the CAP, he had in mind medium-sized mixed farms and thought that the price mechanism support he and others proposed would allow their smooth evolution into larger mixed farms, with the concomitant advantages of mechanisation for the farmers' quality of life. Retrospectively, however, he declared that he did not anticipate that the mechanism would lead to the specialisation and capitalisation of those same farms.

### 3.1.4. The sector and agrarian system level

These basic micro-economic processes were manifested in different forms, depending on the type of farming system and on the techniques available for such a system in the specific sectors of production. Three sectors have been particularly central to the changes that occurred in Europe, namely cereals, dairy and pigs/poultry; the scale of change in the beef and sheepmeat sectors could be characterised as reflecting or adapting to the developments in those three sectors.

***The cereal sector*** has had notable increases in production, based on genetic selection and the increased use of inputs. The expansion of maize, irrigated or not, to the northern and continental zones is a particularly striking development. But the expected gains were not the same across the regions: while most of the productivity increases[5] were achieved in the lowland areas with the best soils, zones with poor soils abandoned cereal cropping as it became easier to import grain from other regions. The increase in production considerably exceeded human consumption needs, and the use of cereals (wheat and maize) in the industrial animal feed sector took off in Europe at this time. Under the influence of the Kennedy Round agreement, the area of (leguminous) protein crops decreased, a development which was made possible by the use of synthetic nitrogen.

***The dairy sector*** also experienced dramatic changes, with the intensification of the Danish/Dutch model and its dissemination across the whole of Europe with the exception of the more humid mountainous areas. The combination of genetic progress and the increased availability of cereal/gluten based feeds complemented with proteins allowed an unprecedented rise in production per cow. Initially, the increased supply of feed resulted in an increase in the number of dairy cows in Europe, a development which was stopped by the introduction of dairy quotas in 1984. The changes in the dairy sector had a secondary impact on land use. Not only was there a relatively smaller number of cows and thus of heifers for a given amount of milk produced, but in many regions, the saltus that was valued for grazing medium productivity drystock was not suitable for more productive ones, leading in turn to its replacement with sown grass leys or maize or an intensification of its management. Note that this process also took place in the mountainous areas and in some permanent grass-based milk sheep systems, though with a lesser level of intensification.

The ***pig and poultry sectors*** were the ones in which the industrial model of agriculture went furthest. While these sectors were previously associated with other types of livestock (pigs as a way to add value to the whey from dairy cows and sheep, for example), they rapidly became based on indoor factories, a model which was imported from the US. Such units can be considered as a by-product of increased cereal production and of the importing of soya beans.

The ***beef sector*** needed to adapt to the changes that took place in the dairy and pig and poultry sectors. The developments in the former led mixed dairy-beef systems to specialise in the production of store cattle, mostly from grass. Finishing would increasingly take place in other areas, with patterns intermediate between intensive dairy production and pig and poultry factories. Generally speaking, the beef meat sector is in competition with the other meat sectors: pigs and poultry on the one hand (with the development of white meats) and dairy cull cows on the other.

The ***pastoral sector*** experienced less radical technical changes but had to adapt to a general weakening of the sector, not to mention the import of sheepmeat from overseas. Generally speaking, the main changes concerned the way animals were kept (fences replacing shepherds) and the use of bought-in feed for fattening.

And finally, the ***permanent crops sector*** also experienced specialisation and intensification, characterised especially by the high use of biocides and a general loss of the patches of saltus within and between parcels, and of naturally occurring grass under trees.

5. It is interesting to note that fertilisers have transformed the former poor saltus of the "Champagne" region in France into one of the most productive areas for cereals and other crops in Europe.

**Table 3.** Main changes in western agrarian systems 1960s-1992

| Geographic context | Agrarian system type | Main technical changes | Usual size of farms | Type, place and function of saltus (SNV)/ager |
|---|---|---|---|---|
| Highly productive areas: good soil and climatic conditions (lowlands) | Intensive mixed, livestock oriented | Dairy specialization and intensification - maize or temporary grassland f(context)<br>Pig/poultry in some Atlantic areas. | Medium to large.<br>Factory farms small (in area terms) | Huge intensification of saltus.<br>Landscape simplification (hedge removal, land consolidation) |
| | Lowland intensive crop | Cereal specialization and intensification.<br>Pig/poultry in some areas. | Medium—very large | Destruction of saltus. |
| Medium productive areas: average soil, no major limitations due to sloping terrain (lowlands) | Lowland mixed: livestock & crops | Decline of mixed systems in favour of other directions depending on the relative advantages of the areas:<br>- specialised crop systems<br>- specialised dairy systems | Large<br>Medium | Huge decline of saltus and development of ager.<br>Destruction of saltus<br>Decline and intensi-fication of saltus |
| Low productive areas: some limitations due to soil and sloping terrain (hills, mountains) | Hills/uplands mixed | Specialisation towards beef production | Medium—large | Formerly ager turns to intensified grassland.<br>Decline of saltus |
| | Mountain livestock (including in Med. area) | Specialisation towards dairy production (+ tourism) | Small—medium | Formerly ager turns to intensified grassland.<br>Saltus maintained |
| Mediterranean areas: highly variable, water availability limiting factor | Mixed crop (e.g. coltura promiscua) | Overall decline; patrimonial strategy or are taken over by perm. crop systems | Small | Overall decline, especially of transhumance |
| | Pastoral | Overall decline, but the extensive characteristic is kept | Medium, but large area might be grazed off farm | High diversity of extensive saltus types, with limited share of grass when land is not abandoned |
| | Permanent crops (vines, olive, fruits..) | Specialisation and intensification - development of mechanised irrigation | Decline of small farms | Huge decline of saltus |
| Artic area: soil and climate constraints | Pastoral | Overall decline, but the extensive characteristic is kept | Off farm grazing | ? |
| All areas | Subsistence | Overall decline | Small (even very small) | |

Table 3 summarises the changes by sector, but note that at the farm scale the same general mechanisms that were outlined above were present in every sector, viz. increased capital/fixed costs, more inputs/variable costs and specialisation/simplification.

The processes that took place during this period thus strengthened the interrelationships between agrarian systems, which themselves became more and more specialised. In particular, the cereal intensification that took place in the most advantaged areas had an impact on the whole livestock sector, supplying the industry with animal food. There were several levels of impact:

- through the development in Europe of industrial factory farms (pig, poultry and beef finishing) that are direct users of cereals (the cost of animal feed represents around 70% of all costs in this type of system);
- through the intensification of the dairy sector; and
- indirectly, through the competition induced between the intensive livestock sectors and those based on permanent pastures/saltus.

As a whole, Table 3 shows the dramatic pressure on saltus in almost every type of agrarian system, both in terms of quantity and quality. The decline of biodiversity in European agriculture is largely explained by these trends, along with the increased

use of biocides. It should be noted that while the decline of permanent grassland is generally quoted as one of the main indicators for biodiversity—and it indeed showed a 12% decrease between 1975 and 1995 in the EU9 (EC, 1999)—qualitative changes *within* the population of permanent grasslands (i.e. intensification) are of crucial importance, despite being poorly documented statistically.

### 3.1.5. A comparison between the Western, Central and Eastern European countries

The 1995 Dobris Assessment (the first European environmental assessment report by the EEA) offers a picture of the state of agriculture at a European scale in the early 1990s. It gives pointers to the common features between EU and non-EU countries—assuming that the starting point in terms of input use was similar in broad terms, except in the Netherlands—and it also highlights the differences.

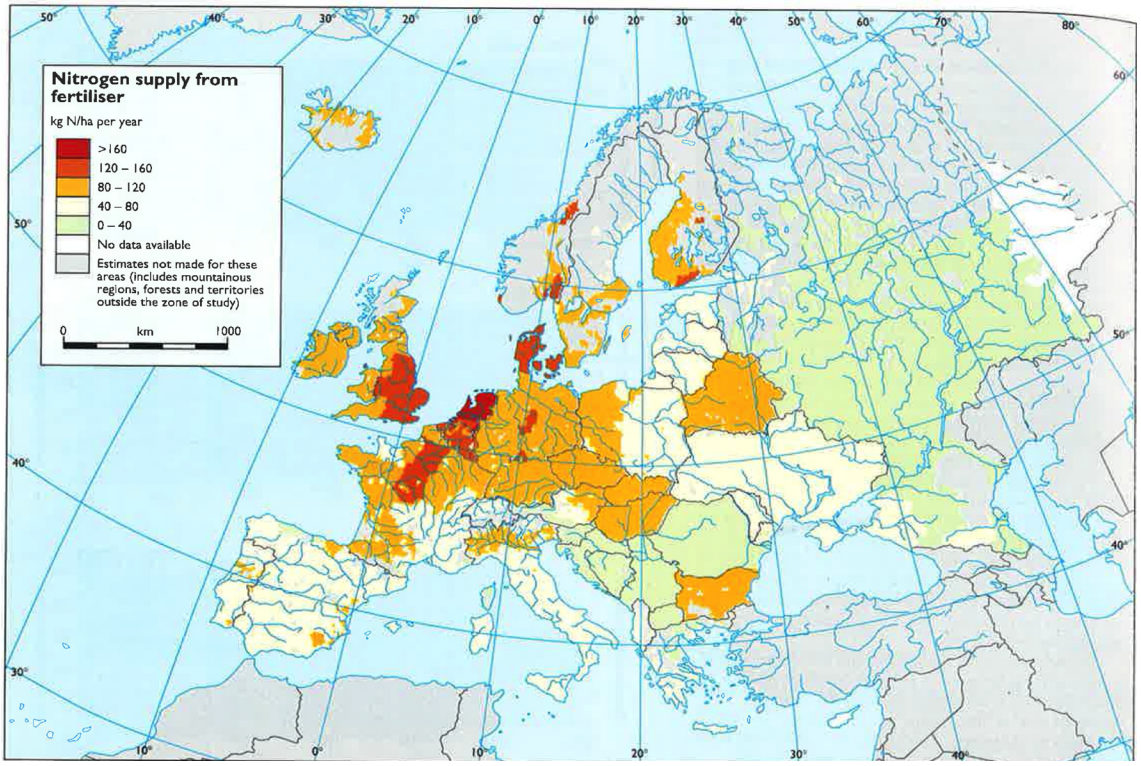
Among the common features is the intensification of large arable farms, including the large state and cooperative farms in the East—Map 1shows the use of synthetic nitrogen/ha (a proxy for agricultural intensification).

Agricultural production rose significantly at a similar relative pace on both sides of the Iron Curtain. Amongst the Eastern countries, East Germany and Czech Republic were the leaders (due to their industrialised agriculture) as was Poland, the latter being based on a small farm model. According to this indicator, Bulgaria and Romania were relatively backward.

Figure 1 also shows that the highest volatility of production was in the non-EU countries, especially from the 1980s onwards. The relative stability of EU countries can be related in part at least to the stabilising effect of the CAP and the development of techniques limiting natural variations (drainage, irrigation and general use of inputs). The figure also shows another common trend—that of employment in agriculture, while the Dobris report notes that the increase of farm size had been more rapid in EU countries—which is unsurprising given the contrasting land ownership frameworks.

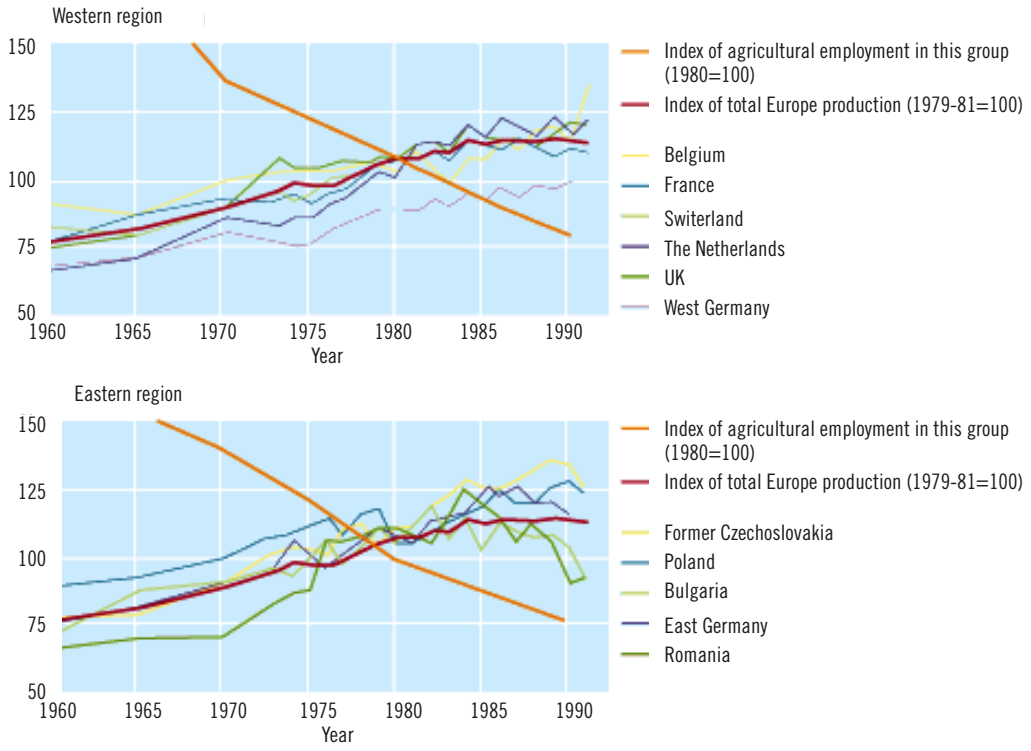
The main differences between West and East are in the livestock sectors, and in particular in the development of intensive livestock sectors, as can be seen in Map 1, which shows how much nitrogen

**Map 1.** Nitrogen supply from fertiliser, 1991




Source : From Dobris report, p. 458.

**Figure 1.** Agricultural production and employment in selected countries (1960-1991)




Source : http://www.eea.europa.eu/publications/92-827-5122-8/page011.html

was derived from manures. The concentration of manure, and thus of livestock, only takes place in EU countries, and notably in the Atlantic zone, in Germany and on the Po Plain. In Eastern countries, traditionally managed pigs and poultry were the main sources of meat in most small farms, while goat and sheep herds were farmed in mountainous areas.

Figure 2 gives a more detailed insight. With the exception of East Germany in the case of pig production, the non-EU countries show much lower livestock densities in both the pig and cattle sectors. Sheep densities were significant in non-EU countries; they were largely linked to saltus there. In the EU, Mediterranean countries such as Spain and Greece also show significant sheep densities, mainly for reasons of statistical artefact, while most of the saltus is not counted in the statistics due to its common land characteristic. The case of the UK reflects a lowland intensification process.

Thus, in non-EU countries, intensive livestock hardly developed—probably because the domestic economies could not afford meat and dairy products on a large scale—while extensive livestock remained in the peripheral regions and in mixed farming systems.

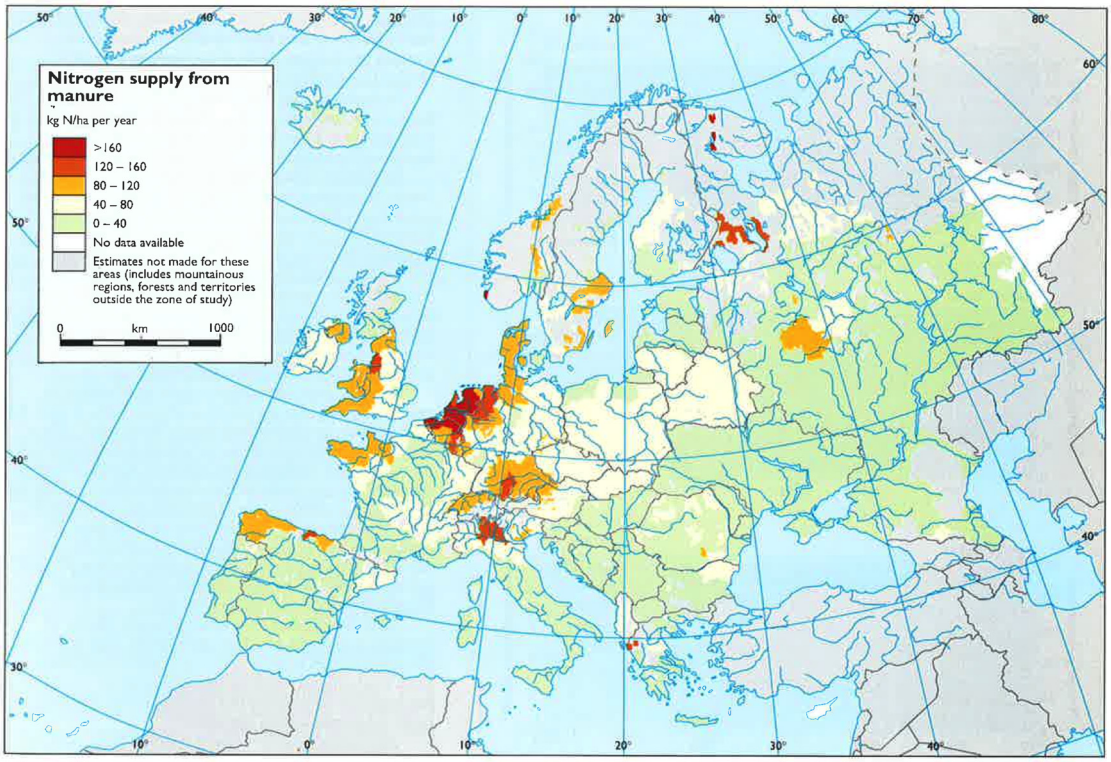
### 3.1.6. The upstream and downstream agricultural industries in the EU

Comparing the agri-food chain of EU countries in the 1960s with the situation in 1992 is quite striking. Changes in the upstream sectors—mechanisation and tractors, chemical industries, seeds and genetic resources—are spectacular. Such sectors existed before WWII, notably in the industrialised countries (Germany, France and the UK, not to mention the US), but during this period they developed and strengthened considerably, reflecting developments in agriculture.

It can be argued that this trend would have taken place anyway, but it is also true that the CAP payments at farm level both supported and secured the development of the upstream agricultural industries in Western European countries. The Dobris report points out that in West Germany there were 12 tractors per km² in 1990 and 3 in East Germany.

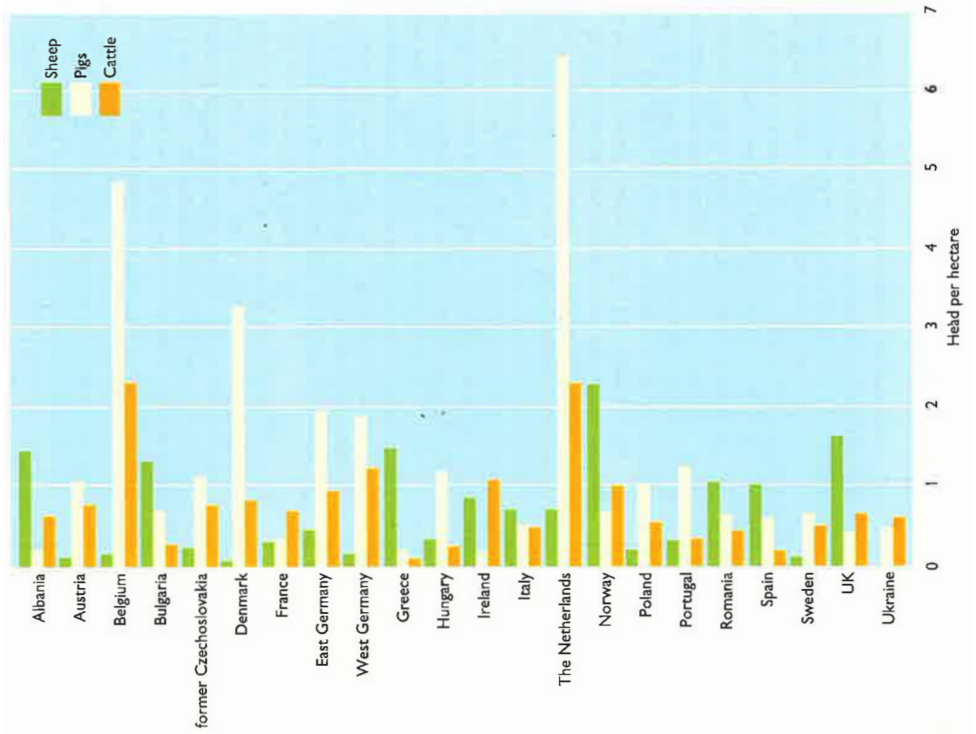
Downstream, the changes affecting the whole agri-food chain are also significant. There was already a link between the regional specialisation of farms and the location of collecting points (cereals, dairy, beef), but it changed qualitatively over the period, as those collection points increased in capital and physical capacity. A search for economies

**Map 2.** Nitrogen supply from manure, 1991.




Source: From Dobris report, p. 455.

**Figure 2.** Livestock density/ha of utilised agricultural area (UAA) in European countries, 1991.




Source: Dobris p. 454.

of scale took place in these downstream sectors, just as it did on the farm. To quote a 1999 study from the EC: "*In recent years the agri-foodstuffs sector in Europe has seen much more sustained activity than the agricultural sector. Gross Value Added at market prices for the European agri-foodstuffs sector increased sixfold between 1970 and 1986 and doubled between 1986 and 1996.*"[6]

It can be argued that during this period the paradigm shifted from an agronomic supply rationale (agri-food industries adapting to the production patterns of different regions) to one based on downstream demand (collection points dictating the structure of farm production). The development of the common European market in particular favoured the competitive specialisation of regions and thus of farms. This factor is paramount—the overall structure of the agri-food chain was set in this period, with little changes in the broad pattern since; any restructuring that has occurred since then has not changed the general pattern of regional specialisation in most EU countries. In comparison, non-EU countries did not develop any major organisational structure in this field.

#### 3.1.7. Conclusion on the 1960s-1992 period: all drivers pushing in the same direction in the countries with CAP instruments

Many historians have already described these events in much more detail—the modern agricultural revolution completely changed the relationship between farming and the environment on the one hand, and farming and the economy on the other.

The remarkable thing from our perspective is the convergence of policy, technical and economic signals, all of which gave the same message. Everything drove agriculture towards specialisation and industrialisation. The only farmers not to be caught up by these sweeping changes were those who could not afford the necessary means of production (land, capital, expertise), those who were confronted with excessive debt, and a few environmentalists and defenders of traditional landscapes. After all, most of the stated outcomes were essentially desirable: affordable food, modern agriculture, employment in rural areas where industries were allowed to develop (while the accompanying loss of employment elsewhere was not visible). The domination of nature that seemed to be possible for the first time in history was so closely associated to modernisation that, in some cases, it was seen as an end in itself, even if the associated costs were high. Given all this, it is quite understandable that actors in the sectors which benefited from these developments—some farmers, the related upstream and downstream industries — have strongly defended their interests in their dealings with public bodies: ministries, research institutes and the European Commission.

But this success, accompanied by the CAP, had a limit: the budgetary needs for the policy. The main problem was probably not the absolute level of expenses, but the fact that the system had no mechanism or rationale by which to stop their increase.

## 3.2. 1992–2007: addressing overproduction and environmental challenges

The recent history of CAP and agriculture can be divided into two sub-periods. The first one runs from 1992 to 2003 and can be characterised by an overall issue of addressing overproduction while developing, to a limited extent, environmental tools in the CAP. It comprises the reforms of 1992 (MacSharry), 1999 (Agenda 2000) and 2003 (Mid-Term Review).

The 2008 CAP Health Check took place in a rather different context characterised by (i) a return of the production paradigm—after the food crisis of 2007-2008—and (ii) an "efficient farming" paradigm largely influenced by the climate change agenda. The change is visible in the way the extensification cause was defended to some extent before this turning point, but was largely forgotten after it.

#### 3.2.1. The changes of the 1992 CAP reform

Further drivers influenced the CAP reform of 1992. Budgetary control was necessary to maintain cohesion between the payers (notably Germany) and the beneficiaries (notably France and Spain), particularly given that Germany had to cope with its own reunification. Thirty years after the CAP's foundation, the focus became the reduction of cereal overproduction. GATT negotiations also played a role in a post Cold War context where trade liberalization was the watchword.

The combination of these drivers led to the overall philosophy of decoupled payments and production control. The intent of the 30% cut in intervention prices for the cereal sector was to reduce the EU's overproduction of this commodity to make it competitive against grain substitutes (e.g. US imported corn gluten feed). The introduction of the requirement to set-aside 10% of crop area was an additional layer to reduce overproduction.

6. Agriculture, environment, rural development: facts and figures. Eurostat, DG agri, DG Env. http://ec.europa.eu/agriculture/envir/report/en/index.htm

In this context, the introduction of obligatory AEM in the same CAP reform made sense and offered a perspective in which public money was offered to "accompany" the transition towards a less productive and more environmental agriculture, all the more so given that the two main environmental directives—Nitrates and Habitats—introduced in 1991 centrally addressed agriculture and gave guidance of the overall objectives to be reached, namely biodiversity and water quality. Extensification of agriculture (including incentives for less-intensive beef farms) appeared as an acceptable paradigm by many actors in broad terms; it combines the reduction of surpluses while pushing towards environmentally friendly practices.

When compared to the previous CAP period, the change of paradigm is quite radical. As a whole, it meant less money for global market support, more micro-economic responsibility and a greater incentive for environmental changes.

### 3.2.2. The enduring legacy of the previous period and an ambiguous decoupling

However, the 1992 CAP reform was designed in reference to the former payment system. Indeed the direct payments introduced a first signal towards decoupling, in the sense that public support was no longer directly related to a production volume but to a certain type of land use. But they still were *compensatory* payments, and still indirectly proportional to production levels of the recent past. Despite the possibility of reallocation between regions/farmers, the calculation was such that the envelope of each Member State had to remain unchanged in order to maintain policy acceptance. Indeed, the 1992 CAP reform made visible, at the individual level, the overall macro-economic support that had previously been carried by intervention prices. But it did not change the fact that the economic balance of most farms, whether they were highly productive or otherwise, depended on the existence of public support. In fact, maintaining higher agricultural prices in "fortress Europe", when compared to world prices, before 1992 allowed the capitalisation of the different farming sectors (cereals and meat notably). What the direct payments of 1992 had to "compensate" can be precisely interpreted as the loss of capitalisation capacity that would otherwise have taken place.

As we have seen above, the 30 years between 1962 and 1992 sustained the setting-up of a heavily equipped agriculture and the associated upstream and downstream sectors. This could not be abandoned overnight and the structure of payments had to reflect the structure of farms and farming in broad terms, with the notable exception of dairy quotas. It should be emphasized that this legacy of the pre-1992 level of support between Member States and between farming systems and regions is still at play, 20 years later, in the present CAP negotiations. The path dependency in this domain is huge, due to the structural interests in place. In fact, the following CAP reforms of the last 20 years can largely be interpreted as attempts to gradually move the lines within this frame and reallocate payments between Member States/regions/sectors, with very strong resistance from the main beneficiaries, namely the best-equipped farmers, suppliers, landowners, the downstream actors and the regions and Member States that receive the most under the current structures. While payments are indeed decoupled from production at a micro-economic level (an individual farmer does not need to produce in order to get a payment, so long as he maintains his land in good agricultural condition), they are not decoupled from productive regions and sectors.

This 1992 legacy is also visible in the distribution of payments between "old" (EU15) and "new" Member States (EU12). The single area payment (EU12) is on average lower than the single farm payment (EU15), due to its calculation based on the budget agreement and not on historical payments. At least this is the case on more productive land; for less productive land, such as extensive pastures, the flat-rate systems of the EU12 result in higher per hectare payments than are received on equivalent land in most of the EU 15 (those applying the historic system).

### 3.2.3. The "cerealization" of EU agriculture from 1992

One could have expected that the 30% decrease in the cereal price of 1992 would have caused a decline in production. But, as mentioned above, the intent was to reduce grain surpluses by a greater access of EU cereals for the EU market, by rendering them competitive relative to grain substitutes (whose importation to Europe had been negotiated in the Kennedy Round of GATT in 1962, as explained previously). The results were unexpected, as shown by Figures 3, 4 and 5.

### 3.2.4. The sectors and agrarian system analysis: continuing the past developments—the restructuring of farms

Changes between the 1960s and the 1990s had set the overall structure of agrarian systems in terms of technical rationale and geography. Despite the apparent radical change in the CAP approach in 1992—some observers of the MacSharry reform anticipated a collapse of production and of the

number of farms—what is striking over the long period is indeed the continuity in the pace and nature of changes, at least in Western Europe corresponding to EU15 (as indicated in Figure 6).

In fact, as suggested above, the "compensatory" approach of the reformed CAP of 1992, an approach that was continued in 1999 and 2003, has had the same overall effect on the economies of different farms. Payments had been calculated to preserve the economic balance in place—that is to say covering the structural costs. The introduction of land-related payments made the link between capitalisation and farm enlargement more obvious—and indeed created a land "rent" (income)—but it did not really change the nature of this link. From a farm perspective, direct payments were decoupled from the production level, but they were not decoupled from the capacity of investment. This "rule" has to be fundamentally recognised and understood and explains why productive farmers still call for payments: their productivity is expensive in terms of capital and variable costs.

Thus, most of the described changes took place in the different sectors between 1960 and 1992, occurring in the same overall frame. However, the maintenance of trends does not mean that the picture of EU agriculture had been frozen and that all the trends were in the same direction.

At a more detailed level of analysis, two trends can be observed:

- cereals and pig/poultry sectors experienced a significant increase in production[7] (for example, see Figure 4 in regard to cereals, while pig/poultry increased by a staggering 15-20% in terms of volume in less than 5 years in the EU15).
- dairy, beef and sheep/goats sectors reached production plateaux for different reasons—dairy quotas for the former, and competition with white meats for the latter three.

At the farm level, different developments can be observed as summarized in Table 4.

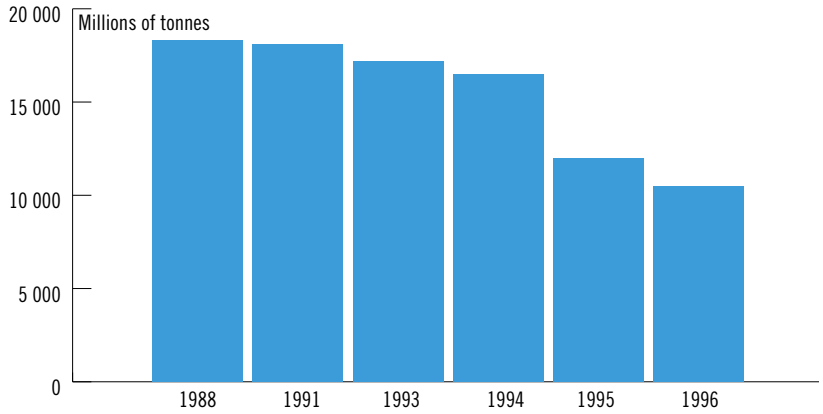
In many ways, the structure and the nature of the changes described in Table 4 are quite similar to those of Table 3 (1960s-1990s). But the result of these continuing changes was to eventually alter the nature value of most European landscapes. The pre-1960 legacy was so rich in terms of nature value that in most regions, the changes that took place in the three following decades did not

7. After having reached a plateau between 1992 and 1996, cereal production re-started in Europe.

**Table 4.** Main changes in EU agrarian systems from 1992.

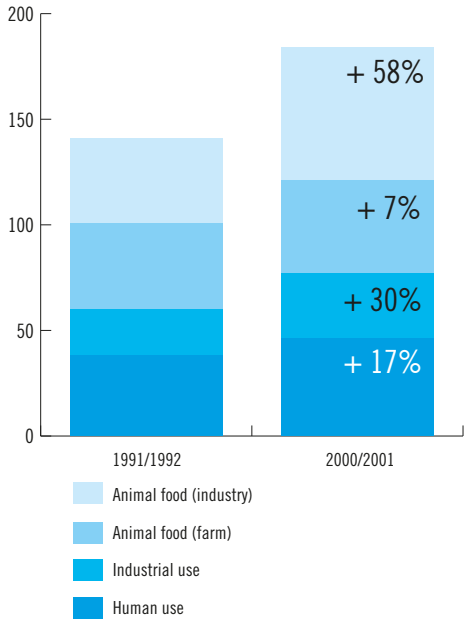
| Geographic context | Agrarian system type | Main changes |
|---|---|---|
| Highly productive areas: good soil and climatic conditions (lowlands) | Intensive mixed, livestock oriented | Dairy: restructuring to bigger farms. Same amount of milk with less cows (+14% milk yield 1990-2000). Relative development of cereals/maize on "saved" grassland in The Netherlands, Belgium, France — intensification of grassland in UK and Ireland. Some farms re-orient towards meat production. Development of pig/poultry in existing production areas. For all farm types: the purchase of animal feed (cereals/protein) is increased. Decline of saltus. |
| | Lowland intensive crop | Cereal specialization continues; restructuring. More efficient use of inputs (in terms of N per ton produced). Near disappearance of saltus. |
| Medium productive areas: average soil, no major limitations due to sloping terrain (lowlands) | Lowland mixed: livestock & crops | Development of crop systems with relative decline of specialised dairy systems. Restructuring of farms / near disappearance of saltus. |
| Low productive areas: some limitations due to soil and sloping terrain (hills, mountains) | Hills/uplands mixed | Continuation of specialisation towards beef production. Larger farms; grass intensification + more bought-in animal feed / decline of saltus. |
| | Mountain livestock (including in Med. area) | Continuation of specialisation towards dairy production (+ tourism). Larger farms; grass intensification + greater purchase of animal feed / decline of saltus. |
| Mediterranean areas: highly variable, water availability limiting factor | Mixed crop (e.g. coltura promiscua) | Overall decline; patrimonial strategy or taken over by permanent crop systems. |
| | Pastoral | Overall decline, local abandonment, some intensification but extensive characteristic broadly kept. Larger farms and restructuration tend to replace forage from saltus by bought-in animal feed. |
| | Permanent crop (vines, olive, fruits, etc.) | Specialisation and intensification - development of mechanised irrigation. Abandonment of marginal, low-intensity systems. Decline of associated saltus. |
| Arctic area: soil and climate constraints | Pastoral | Overall decline (?) |
| All areas | Subsistence | Overall decline |

**Figure 3.** Reduced imports of grain substitutes (1988-1996).



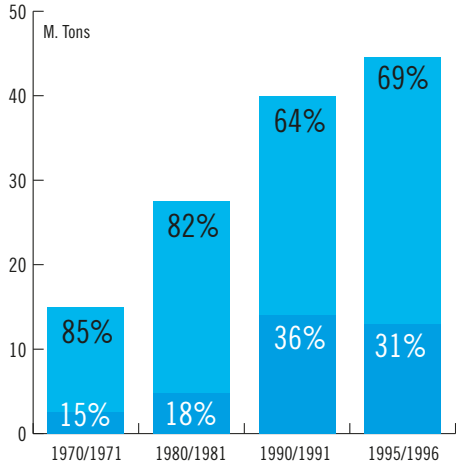

Source: www.senat.fr/rap/l97-087-1/l97-087-112.html

**Figure 4.** Subsequent increase in cereal use (1992-2000).



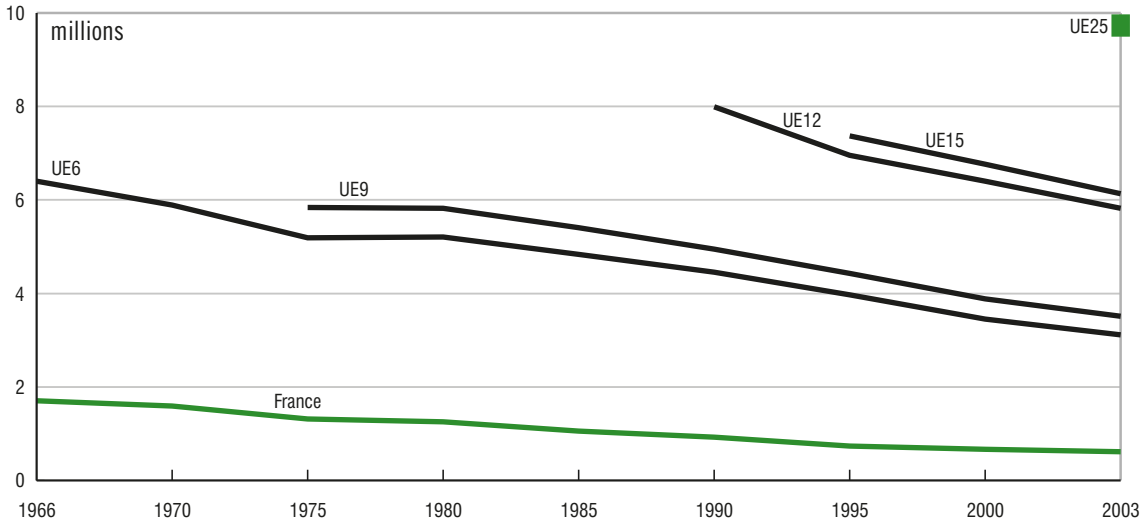

Source: Poux and Ramain, 2007.

**Figure 5.** Import of protein rich foodstuff



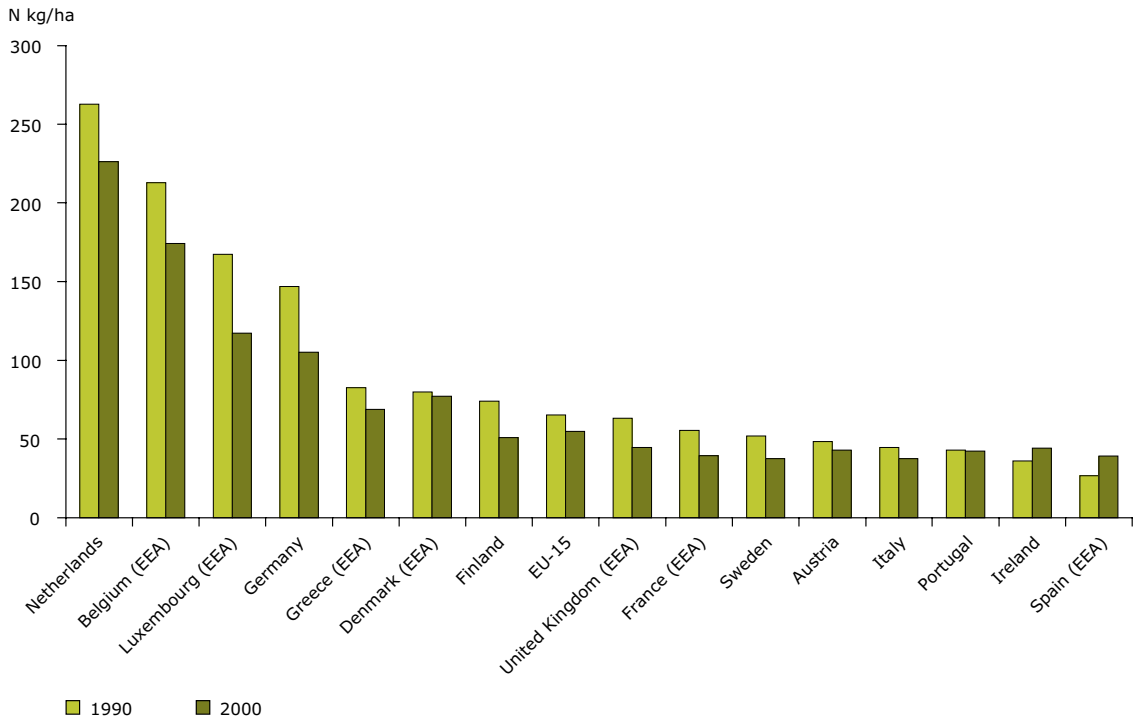

Source: www.senat.fr/rap/l97-087-1/l97-087-112.html
Note : black figures show the percentages imported from non-EU countries

**Figure 6.** Evolution of the number of farms in the EU between 1966 and 2003.




Source: Structures survey, Eurostat, from Chatelier and Delame, 2007.
Note: For Germany, EU6, EU9 and EU12 data refer to West Germany until 1990.

**Figure 7.** National gross nitrogen balances (kg/ha) in 1990 and 2000: towards efficient farming.




Source: EEA, 2006.

destroy every landscape feature. Indeed, the development of crops systems had taken place in the rich plains of Europe from 1960. But in the early 1990s there were still some sparse dairy/livestock systems in those plains, maintaining some landscape features. The 1992 CAP coincided with a generational change (the one of the farmers who had continued with a mixed system pattern) and it is likely therefore that some changes would have taken place in any case. But the policy and economic signals were in favour of crops and large farms and probably speeded up these developments. Incidentally, this development went along with «*Improved productivity of crops and livestock resulting from plant breeding or from the development of new technologies allowing for more optimal use of feed, water and other inputs may lead to both decreased use of such inputs and more intensive production systems*" (EEA 2006).

A different picture emerged in regions that were predominantly grassland/permanent pastures because the place of livestock was not called into question as it was in the arable regions. But the increase of farm size—i.e. more animal heads/labour unit—led to efforts to simplify the work. This meant an increase in production/head (as the time to feed and milk one animal yielding 3,000 kg of milk or one yielding 6,000 kg is similar) and less time spent on maintaining the saltus. In such regions, the extent of the decline of saltus, by intensification or abandonment, depended on the local peculiarities and the possibility (or not) for intensification.

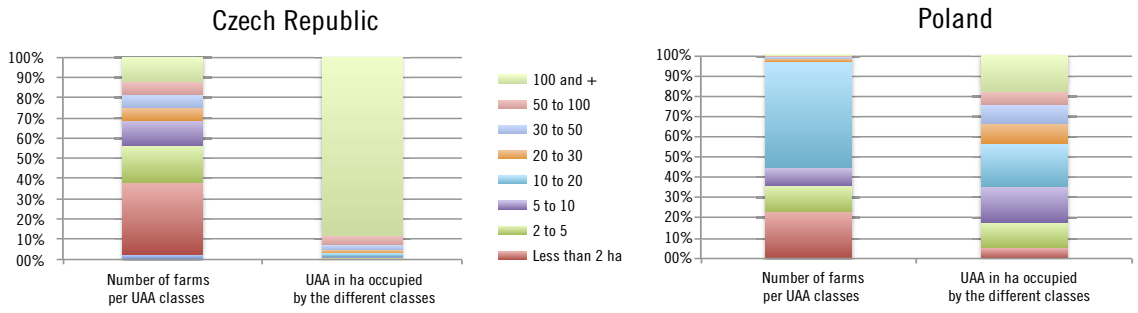
In summary, while pre-1992 trends of input usage and the decrease of SNV could be combined into the same process, the change in direction that took place following this date reveals the difference between efficient farming (indeed driven by a ratio between commodity prices and input prices and the development of farm technologies) and biodiversity conservation.

### 3.2.5. The limited role of environmental instruments for biodiversity conservation

Paradoxically, the same period 1992-2007 also corresponds to the increase of environmental concerns and schemes in the CAP. The AEM that were introduced in 1985 became obligatory for Member States in 1992, developing gradually from then, though with a limited budget share resulting from the initial budgetary balance inherited from 1992 (see above), and with considerable differences between countries (AEM soon became a major intervention instrument in some countries, while some others introduced only very minor schemes for many years and even up to the present day). Cross-compliance was introduced in the 1999 reform on a voluntary basis, and became mandatory in 2003. This latest change formally addressed the issue of permanent pastures protection, although in practice the instrument is known to be deficient.

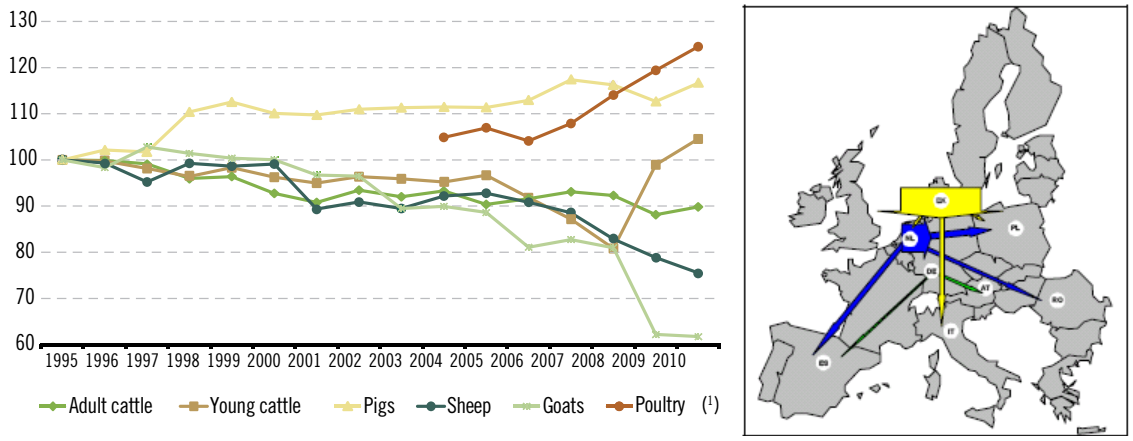
But without further development in this analysis, it can be said that the role of these instruments has so far been limited for biodiversity conservation, not to say counter-productive in some cases. While there may be several reasons for this, the first stems from the fact that the bulk of AEM money has been spent on poorly targeted objectives, such as pollution or irrigation reduction in intensive areas to support grassland in general or small reductions in farming intensity, or for very specific conservation schemes targeting certain species or sites, without considering overall quality or biodiversity objectives. This does not mean that AEM are efficient or otherwise in themselves, but that their impact primarily depends on the quality of their design, implementation and evaluation (Kleijn and Sutherland, 2003), and on the scale of their implementation. As regards cross-compliance, it is the often very broad aims of schemes that fundamentally limits the scope of the measure. It has in

**Figure 8.** Land structure in the Czech Republic and Poland




Source: Eurostat, 2007 data.

**Figure 9.** Development of meat production (left; 1995 index) and pattern of the intra-EU exchanges for young pigs (right; 2008): new Member States are new markets for EU15 pig production.




Source: Eurostat.

fact been designed and negotiated in a way that it should hardly change the macro-economic trends in place (Farmer *et al.*, 2007). Its logic is to push for marginal improvements on intensive land but it does not address the fundamental economic needs of saltus conservation. On the contrary, these needs are largely ignored in the very basis of AEM payment calculation through the income foregone system. However, this does not mean that AEM has had no impact on the ground, at farm level. There are notable differences that must be emphasized between the constraints imposed on different farming systems: formal requirements, in most cases, apply to crop systems; the requirements that cover intensive livestock systems relate to efficient resource use and sanitary rules that they can easily cope with; while the requirements applying to extensive livestock systems go against land management and the very logic of these systems. The effect has been a land abandonment process in Europe's most marginal areas, with a huge impact on biodiversity.

In addition, it should be remembered that the development of these instruments took place in an overall context in which the "cerealization" of EU agriculture occurred. They were not strong enough to counter the effects of this process, whether in the crops systems themselves or in the livestock systems downstream.

### 3.2.6. The case of the new Member States—the structural legacy

The above analysis is relevant to the EU15. The circumstances in the "new" Member States requires specific consideration. From a biodiversity conservation perspective, the situation is quite different and, as mentioned above in the section on the previous time period, it is marked by a strong duality.

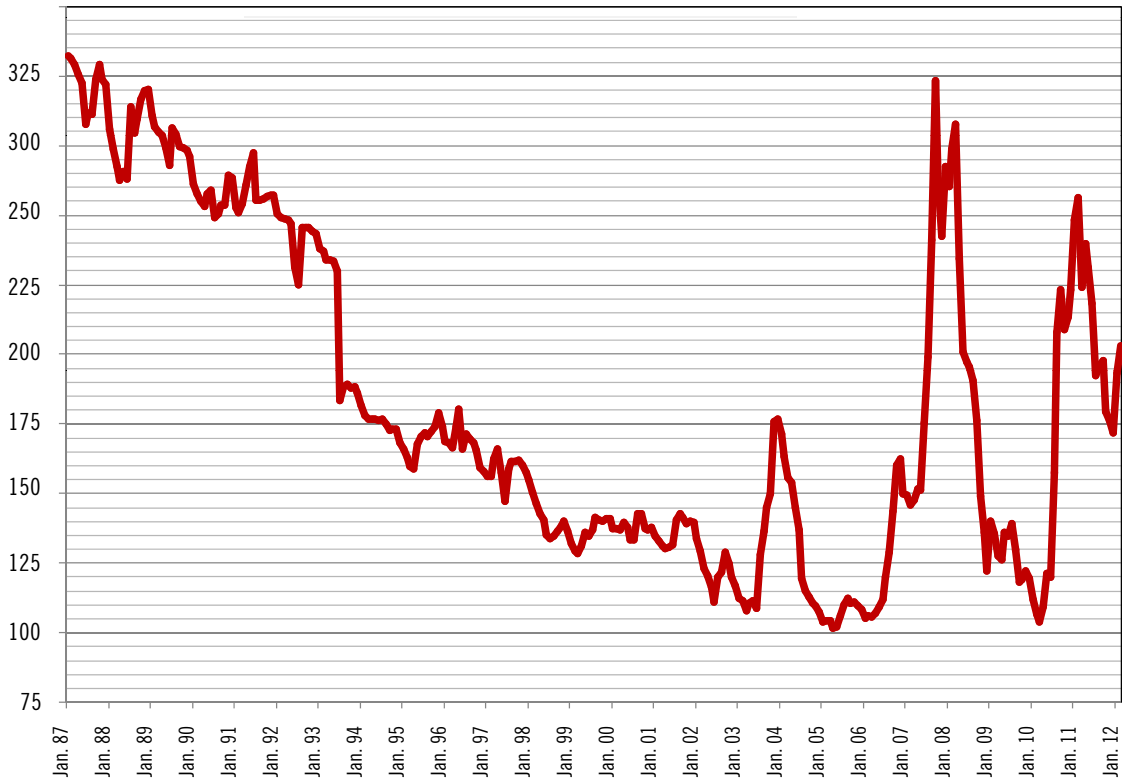
In some countries, Czech Republic and Hungary for example, the legacy of very large arable state-holdings is visible through their huge dominance in the overall land-share. In others, notably Poland and Romania, small farms remained (see Figure 8) (in fact, the duality can be found *within* Romania).

The structural duality can, in broad terms, be correlated with the nature value of the farms, the large farms corresponding to modern agriculture—though less equipped than those in the EU15—while medium-small farms still rely on mixed farming (Oppermann *et al.*, 2012). An important omission in the data are pastoral systems (primarily saltus) which, from a statistical point of view, are classified as landless production systems. Although they constitute a large share of land, they are excluded from the statistics and often ineligible for CAP payments.

Following the collapse of the Iron Curtain and before entering the European Union, the new Member States experienced a strong disorganisation of their agriculture sector, notably leading to a lesser use of inputs in large crop farm holdings while small farms and pastoral ones, being semi-subsistence or for local markets, could cope on the basis of autonomous systems.

Entering the CAP and the single area payment schemes gave EU12 farmers (at least those that could receive payments—many could not) the opportunity to invest in the same way as their western neighbours had done 40 years earlier. But the area based payment scheme gives much more leverage to large farms—ones that historically had been involved in the crop sector—than it does to small ones (Csaki and Jambor, 2010). Hence, in the

**Figure 10.** Evolution of the price of the common wheat in France (1987-2012, in 2011 constant euro).




Source: Association générale des producteurs de blé (*General association of wheat producers*).

structural context of new Member States where medium-sized farms are relatively rare, the uneven competition between large/small farms is much stronger than it used to be in most EU15 Member States. In terms of an agrarian systems analysis, the issue is the maintenance of the bulk of small-medium mixed systems, whose livestock densities are still low compared to most EU15 countries, which explains their enduringly high nature value where such systems survive. But these systems are endangered by the development of intensive livestock holdings founded on purchased animal feed.

The picture is further complicated by the fact that a vast number of very small farms are excluded from CAP payments as a result of minimum size thresholds, while large areas of saltus grazing land are excluded by CAP eligibility rules. But where low-productivity land is in receipt of CAP support from the 1st Pillar, the rate of support per hectare is higher than in most EU15 states (where the historic system is heavily weighted against low-productivity land).

It should be noted that the present development of the EU12's agricultural sector is influenced by the EU15's agri-food sector, for which those countries represent a new market, with huge potential. It should be remembered that Germany, France, Italy, Spain and the UK account for 70% of the turnover of EU27 agri-food industries, whereas the twelve new Member States account for only 8.7%. This vision of potential development through modernisation is shared by most EU15 and EU12 actors, and strongly calls into question the future of HNV farms.

## 3.3. 2008-2012: the return of the production paradigm

### 3.3.1. The radical change of 2008

The "food crisis" of 2008 is a milestone. It was triggered by a range of factors that combined to cause an unprecedented rise in cereal prices: low grain stocks at the global level, scarcity caused by the use of grain for US biofuels and financialisation of the cereals market.

From this period onwards, cereal price volatility and increases are responsible for changing the whole issue for EU farming. While the preceding

period (1992-2007) had been characterised by the use of more competitive EU cereals in EU livestock industries, the present one is marked by contradictory interests between the upstream cereal sector and the downstream livestock users. Indeed, EU cereals are still competitive compared to world cereals, but their rising prices have meant an increase in production costs for intensive livestock systems. So far, the answer to this signal has been more farm restructuring, rather than a search for more autonomy. In this context, the call for CAP payments to support such restructuring is louder than ever.

#### 3.3.2. Changes in the CAP philosophy

This change in the grain economy has also influenced the philosophy of the CAP. The reforms of 1992, 1999 and 2003 addressed the issue of overproduction, trying to bridge it with environmental conservation, including biodiversity. The 2008 CAP health check can be interpreted as a change in approach: the drop of set-aside land and the importance given to biofuel production puts the emphasis on a productionist paradigm. This change also takes place in a context where the need to feed a global population of 9 billion in 2050 seems to justify a "restart of production".

This new context does not reject everything that had been established in the previous CAP, and the EC proposals under discussion for the 2014-2020 period might indeed be interpreted as a certain form of continuity, trying to achieve a fundamental redistribution of support while formally keeping and even strengthening the environmental dimension of the CAP. However, negotiations between the EC, Member States and the European Parliament suggest that stakeholders seem to be looking for ways to avoid significant redistribution along with a weakening of the environmental instruments and, in particular, the introduction of a menu approach where every Member State is able to choose its own way forward.

# 4. CONCLUSION: THE ESSENTIAL FEATURES OF A CAP WHICH SUPPORTS BIODIVERSITY CONSERVATION

## 4.1. It must take into account the two competing types of agricultural development

The majority of habitats and species related to agriculture depend on a minimum share of SNV (saltus) in agrarian systems. Seen from this perspective, the decline of biodiversity in Europe during the last decades can be linked to the loss of both the agro-ecological and the socio-economic functions of saltus in most agrarian systems, including those that were linked to the sustainable management of low-input cropland (*ager*). This realisation underlies the fundamental rationale of the HNV farming concept: biodiversity conservation in the medium to long term depends on the future of economically viable farming systems that conserve and manage SNV/saltus for production purposes.

An analysis of the recent history of European agriculture shows that the decline of those saltus-friendly agrarian systems is mainly due to their competition with other farming systems at the European and, increasingly, at the global scales. This competition takes place for land, water, funding and markets. More specifically, the extensive livestock systems which, in their huge diversity, are the main users of saltus (they range from pastoral systems to dairy systems which use some saltus for young stock) have been competing in Europe with other types of farming systems rendered possible by the development of industrially-produced inputs (nitrogen, biocides, irrigation water). For example, the low-input farm with tens of cows yielding 2 tonnes of milk a year and largely fed on saltus had—or has, for those who still follow this pattern—to compete with other farms with hundreds of cows yielding 10 tonnes of milk a year, which require considerable inputs, including antibiotics, for their operation. Let us be clear that this competition takes place at different levels. In the same area, a former saltus-based system can be replaced by a more intensive one (when, for example, an extensive grassland is "improved" and/or ploughed). However, at the larger scale, massive developments in transport—and to a lesser extent in refrigeration—mean that this competition now takes place at the scale of the whole EU, between regions.

Such "new" types of farming systems have replaced saltus with cereals and imported proteins and/or intensified grassland of both temporary

and permanent types. Meanwhile, the fate of many extensive semi-natural pastures has been destruction (when replaced by crops or temporary grassland), intensification or, when neither of these options are feasible, abandonment. Indeed, the increased production from input-dependent systems has itself been based on the alteration of saltus: its loss is therefore not merely incidental; this has been the very essence of much agricultural modernisation.

Taking this broader view, it is clear that the future of farming systems which conserve saltus does not just depend on what happens to them in isolation; what occurs in other systems is equally important. While it has been argued that agricultural intensification is a way to preserve (or free up) land for nature conservation, in a land-sparing approach (Tubbs 1997; Green *et al.*, 2005), our analysis makes us question this in a European context where (i) biodiversity is crucially a question of biodiversity that is present on significant areas of farmed land, and not only within conservation areas, and (ii) where intensification is the main cause of their decline. The trouble is that land that has been spared by intensification (and indeed the area under cereals has decreased due to higher yields) has not in most cases been used for low-intensity farming. At the same time, CAP-subsidised afforestation has swallowed up vast areas of saltus of low agricultural productivity, reflecting the fact that EU policy does not have a vision for keeping such land in extensive farming, but actually offers incentives to give up this activity.

## 4.2. It must consider the interactions between the market and policy

In our analysis of change in different agrarian systems, we have considered two broad kinds of drivers: policy, with the huge financial weight of the CAP behind it, and the market. For us, a key message is that those two forces should be considered concurrently, taking note of their interaction.

Let us remind ourselves again of the two distinct periods we can distinguish in the history of EU agriculture since the 1960s. During the first, which ran from the 1960s to the early 1990s, there was a strong reinforcing feedback between the "early" CAP (commodity support) and the development and growth of agri-food chains in Western Europe. While technological changes made intensification and increased production possible at the farm level, the economic signals from the CAP clearly favoured these trends, mirroring developments in the wider agri-food industries, where specialised production regions were being encouraged, especially for cereals, dairy, meat and, to a lesser extent, permanent crops (through structural policies).

The integration of farming systems into wider agri-food complexes was a huge change that took place at a considerable pace in this period. The CAP allowed the supply of these complexes at lower commodity prices, thus enabling a rapid development in the downstream parts of the chain. The pressure on commodity prices made most farming systems dependant on subsidies, while the production factors needed to implement the technical modernisation were costly. A critique of the CAP is perhaps difficult to separate from wider criticisms of industrialisation of agriculture and the whole food supply chain, as they are closely linked. But the issue is not that the changes which can be linked to the CAP are somehow uniquely its result, but that it exacerbated them and allowed their extent and pace to be greater than might otherwise have been the case. The industrialisation of the food chain also took place in other parts of the world—including in Central and Eastern European countries at this same time—but the scale of changes in Western Europe and their impacts on saltus are nevertheless notable, even on the world scale; it is reasonable to ascribe at least some responsibility for this to the increased stability and certainty resulting from the CAP, as we illustrated in the previous pages.

From 1992 onward, the link between the CAP and industrialisation is less obvious. The overall "market regulation" dimension of the CAP is

### Box 1: Defining biodiversity conservation

Biodiversity conservation is frequently taken to imply a strict conservationist approach, with the delineation of areas of environmental interest and their preservation in aspic. In the case of agriculture, this would mean that no changes would be possible.

However, the type of biodiversity conservation in the context of agriculture which we defend here is wider and more dynamic. It assumes that what fundamentally needs to be conserved is the ability of farming systems to manage SNV/saltus and still change and develop. Landscapes have changed for centuries and will continue to do so; the issue is whether they will retain a certain proportion of saltus into the future, as part of the farming system (not merely as conservation adjuncts).

Such biodiversity conservation has two aspects:

- conserving nature value where it actually exists; while habitats can be destroyed in a day, it takes time to recover lost richness;
- developing the landscape matrix and habitats in every type of European agricultural landscape in a way which supports the resilience of ecosystems (connecting networks).

indeed becoming lighter: intervention prices, quotas and export subsidies are being dismantled, to be replaced with decoupled payments. The theory underlying this major shift is to give more freedom to farmers at the micro-economic level so that they can optimize their farming systems. In particular, while commodity-linked support could lead to excessive costs with no net benefit (note how calls for an irrigation premium have been based on the need to cover the excessive production costs of such systems), fully decoupled payments give the option for de-intensifying.

However, if such reasoning makes sense at a micro-economic level, it fails to consider the agri-food context in which farms operate. Farmers do not only receive CAP payments, they also need to sell the products which they now produce in large quantities. The "market signals" are being felt in an economic context in which agri-food industries are competing and looking for economies of scale; developing specialised production regions is a key factor in their competitiveness. The micro-economic optimum does not necessarily correspond to the meso-economic one—many farms might need to take on seemingly-excessive production costs just to stay in the supply chain to be able to sell off the large amounts of commodities which they have invested in producing.

In short, while the CAP was the major driver between 1960 and 1992, it is the agri-food system that is now overwhelmingly dominant. In this environment, CAP payments act as a fuel to perpetuate the processes at play, both in Western Europe and, for the first time, in the new Member States. They are necessary to cover the production costs on many farms. Had decoupled payments been introduced at the beginning of the CAP, addressing small and middle size farms at the beginning of their intensification process rather than when they are already embedded in the wider food chain, history would probably have been different—in extent and speed, if not in nature (see above). Some farmers would have taken the chance to maintain extensive production patterns—something the CAP did not want at that time, as production was its main goal. But nowadays, this decoupled signal has a completely different impact.

Thus DG Agriculture's assertion that *"making the CAP compatible with market requirements goes hand in hand with environmental integration"*[8] appears rather optimistic when it comes to nature conservation in general and changes in the extent and management of SNV in particular. Dominant market forces might, in a certain way, lead to a better management of inputs (the "efficient farming" paradigm) but the "environmental integration" they can produce leaves hardly any room for SNV in the overall scheme of things. Biodiversity conservation is a more demanding matter than simply "doing better: producing more with less". It requires "doing good" in *absolute* terms, and especially in terms of maintaining and managing saltus within the farming system.

(Also see Section 2, "Understanding the relationship between agriculture and biodiversity in Europe: an agrarian systems perspective")

## 4.3. It must not make biodiversity conservation the weakest option in a menu of policies

We must stand firm behind this analysis in the face of those who believe strongly that the market will inevitably push things in the right direction. We believe, for all the reasons outlined above, that it is not sufficient to assume that a "do better" objective based on a resource-efficiency paradigm will work.

Cynicism about its efficacy for biodiversity is not a novelty for nature conservationists and environment economists who have, for a long time, noted the "market failure" in this and similar contexts—we hope we have helped explain such failure. We must go beyond hand-wringing—biodiversity objectives require genuinely targeted instruments for those farming systems that actually manage biodiversity, namely the HNV systems. Figure 11, drawn from Beaufoy *et al.* (2012), proposes just such a coherent approach. This approach is more focussed than a policy of mere grassland maintenance, irrespective of the nature value of the grassland in question, recognising the need to reward and support farmers managing SNV in order to cover the "market failures". For details on the other measures proposed, we refer the reader to the original text.

However, our analysis leads us to think that even such a framework is insufficient; while putting in place policies to support HNV farming is necessary to address their urgent needs, it is not enough unless it is articulated with the wider issue. We can argue on two conclusions, which are not mutually-exclusive:

1. If the bulk of CAP payments[9] continues to support industrial farms whose rationale is to invest in order to supply the mass market, HNV

8. ec.europa.eu/agriculture/envir/cap/index_en.htm

9. Note that those payments might come through the 1st Pillar (i.e. decoupled direct payments and or even "green" payments) and/or the 2nd one (i.e. investment aid, insurance schemes, etc.).

**Figure 11.** Schematic presentation of a policy structure for supporting HNV farming.

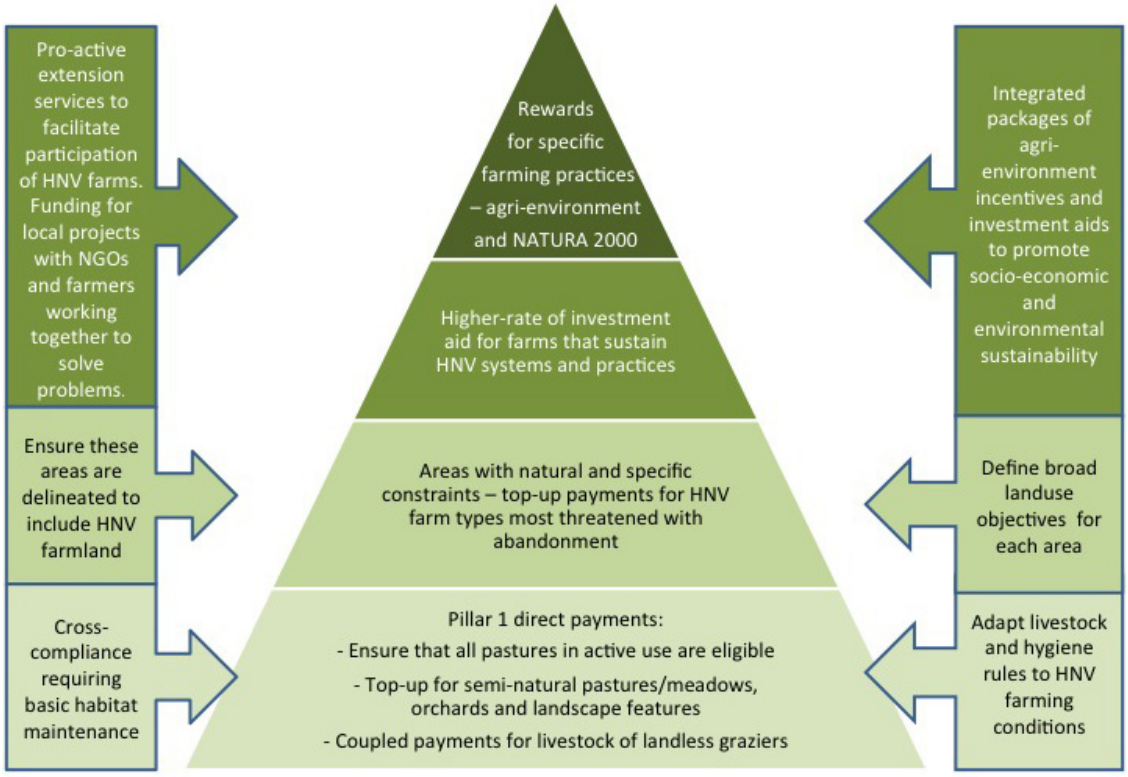
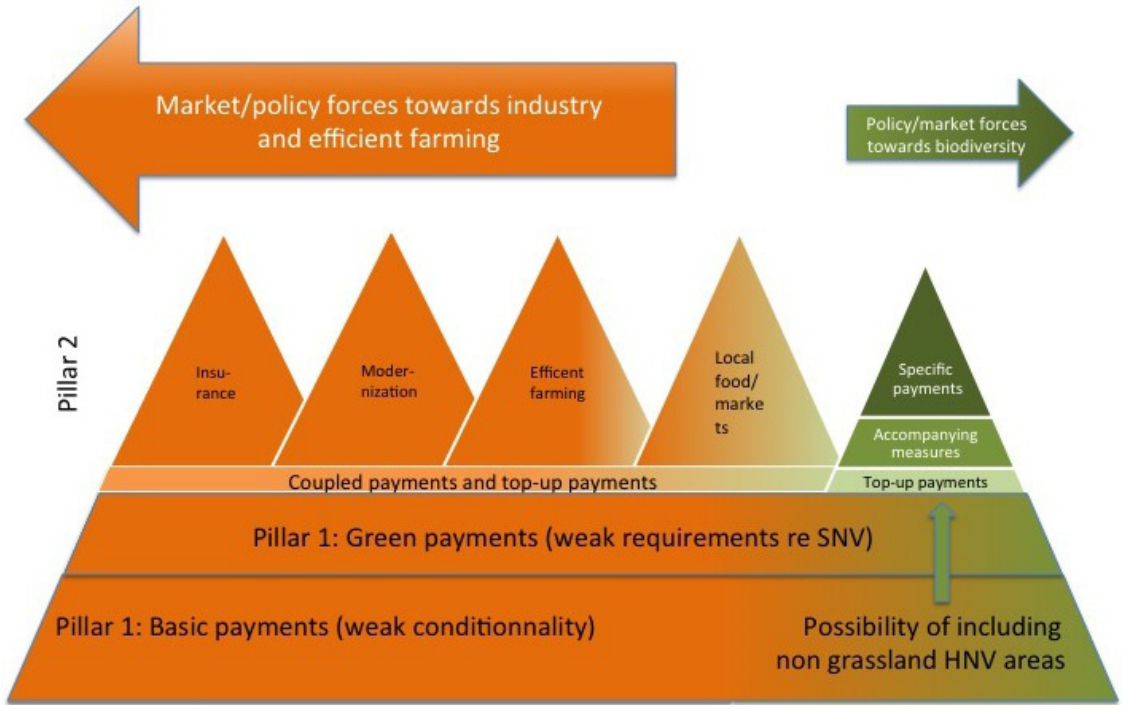



**Figure 12.** HNV/biodiversity conservation policies as part of a wider uneven competition in the CAP.




Source: From Beaufoy *et al.*, 2012.

farms will not be able to compete and survive for long. Creameries and slaughterhouses, even those located near HNV regions, will be driven to import raw material from farming systems in more productive areas, as has been observed in many cases. HNV farms will then either disappear through abandonment or through changing their nature in order to continue as players in the market, as happened on a large scale in most parts of Western Europe and as is likely to be the fate of many of the new Member States. This statement largely echoes the call for the withdrawal of biodiversity-harmful subsidies made in the Nagoya Accord, but our analysis enables us to see the true breadth of this commitment. Making a payment "decoupled" is not sufficient to make it harmless. We have to consider the market context in which the payment is delivered.

2. As long as biodiversity conservation is just one option amongst many in the menu set out by policy, it is likely that it will not be the preferred one. Even within the second Pillar, biodiversity is now just one of a range of objectives. Efficient farming and climate change mitigation offer more recent, arguably more attractive, goals towards which a farmer can strive. Member States can choose to make certain items from the possible European Agricultural Fund for Rural Development (EAFRD) menu available to their farmers by allocating them a budget, while farmers and other potential applicants (businesses and local authorities) can themselves choose whether or not to apply and which options to pick. In some cases, successful projects linking biodiversity conservation and economic development will result, but in most cases the influence of the prevailing political and economic winds will be clear, making it easier to develop more industry/market-friendly projects such as "methanization", which are easily complemented by decoupled payments, for example.

We can now see Beaufoy's HNV pyramid in its wider policy context, in which it competes with other environmentally-efficient farming objectives, let alone more conventional modernisation. Figure 12 illustrates how even a policy signal favouring biodiversity conservation still forms part of a wider picture. What applies to goals and objectives applies equally to the budget share—we see even in our diagram how second Pillar (the top of the pyramids) is smaller than Pillar 1 (base of the pyramids), while the relative size of each pyramid depends on the decisions of each Member State.

This is another way of justifying and understanding the call for "public money only for public goods only" (NGO, 2010), if we assume for the moment that biodiversity conservation objectives capture the bulk of such public goods (we shall come back to this point below). Indeed the CAP *should* be greened, but it should be done in a way that recognises saltus in its core objectives.

## 4.4. How defendable is this biodiversity conservation choice?

This analysis and the policy conclusions derived from it might appear politically unrealistic. It is already hard enough to defend a specific policy aimed at biodiversity conservation without attacking the bulk of payments by labelling them as "biodiversity-harmful" and calling for a radical shift. We can be in no doubt that having an objective of refocusing the CAP on biodiversity/public goods requires a long perspective!

Let us conclude with some remarks on the desirability and the consistency of the objectives, and on the feasibility of our approach. Biodiversity conservation presently appears to be a somewhat ambiguous objective within the wider environmental agenda. On the one hand, the continuing loss of habitats and species is alarming enough to justify commitments and strategies every few years; biodiversity *is* on the policy agenda and its visibility is increasing over the years, despite the failure of the 2010 'no net loss' objective. On the other hand, this objective is also competing with others whose legitimacy is just as strong: water resource protection and climate change mitigation, for example (both chiming with the model of efficient farming of course). For many actors, the priority is these two latest environmental issues, while biodiversity is expected to follow naturally in the future (or in their wake?). They see efficient farming as the first step for biodiversity conservation—one that, we have seen, will fail unless it widens its focus from cropland and/or intensified grassland and seriously and specifically addresses the issue of SNV).

Even ignoring the agricultural elements to the question, this ranking of environmental priorities is questionable. A central goal of climate change mitigation is biodiversity conservation, alongside human safety in the face of natural hazards, so neglecting the cause of habitats/biodiversity in the short term—at a time when they are under huge pressure—and using the climate change emergency as an excuse is at best short-sighted. And much worse if the same choice leads to the "improvement" of saltus at large scale, or its destruction to make room for biofuel crops or afforestation. As recognized by climate change NGOs (e.g. RAC, 2010), climate change mitigation and biodiversity are not an 'either/or'—our proposed model of biodiversity conservation, which implies a large area of permanent pastures and a shrinking of the industrial crop and livestock sectors and thus an

overall decrease in the number of animals and volumes of fertilisers applied, arguably is an efficient way to address the climate mitigation issue.[10]

As for water resource conservation, we can assume that developing/maintaining low input HNV systems with permanent pastures is more than consistent with this objective, taking note of the needs to address some point-source issues such as bacteriological quality. Biodiversity conservation goes beyond the strict management of pollutant flows, and sometimes addresses some aspects only peripherally, but it is an approach which is quite consistent with current water objectives.

Leaving aside these technical matters, the priorities expressed by EU citizens in the Eurobarometer *Europeans, Agriculture and the Common Agricultural Policy* (n° 236-2010) strongly support the overall objective we have sketched:

> *"An overwhelming majority of respondents (85% or more) are supportive of the new objectives for agriculture and rural development, which include: (i) To preserve the countryside (93%); (ii) To help farmers to face the consequences of climate change (89%); (iii) To develop the economy in rural areas (89%); (iv) To distribute support to farmers in a more equitable way (88%); (v) To link financial support farmers get with the compliance to certain rules regarding environmental protection, food safety and animal welfare (87%); and (vi) To encourage farmers to produce what markets demand (85%)."*

Each term can be interpreted separately, but if we consider them all together and take the first objective as an organising principle, biodiversity conservation appears as a credible policy option, assuming that the countryside the public desires includes insects, birds and other biodiversity-linked amenities.

This brings us to the issue of production volumes. Since the food crisis of 2008, the calls for increasing production have been gaining voice; whatever sympathy biodiversity conservation elicits, it might appear to be a bit out of date at best and irresponsible at worst. For a discussion on whether Europe can and should feed the world, see Dufumier (2012)—basically starvation in the developing world is not caused by a global lack of food, but by food being in the wrong place at the wrong time—but at the EU level, there is no need to choose between biodiversity conservation and production. Let us consider that in 1961 the 400 million inhabitants of what would become the EU27 were on average fed from saltus-based farms (and in particular mixed saltus/ager farms), which provided around 3,000 Cal a day according to FAO statistics. Fifty years later, in 2010, the population of the EU27 had increased by a factor of 1.2, reaching 500 million, while cereal production had increased by a factor of 2 and meat production (the main cereal user) by 2.3 in terms of volume.[11] In broad terms, the gap between these two increases has been covered at the expense of biodiversity and huge imports of proteins; reducing this gap gives us a chance to have both biodiversity-friendly EU agriculture and safe, healthy food. There is no need or desire to force a collapse of EU agricultural production, but to support the recovery of SNV and the development of innovative mixed systems and autonomous livestock systems. If we succeed, we would also end up with less industrial meat and dairy products on our plate.

As a whole, this analysis brings us to alternative markets and food chain organisation—with other types of quality standards—to a holistic understanding of innovation—and not only a technologically-based one—and to the justification for other objectives and requirements attached to CAP payments.

10. While different scenarios have been proposed for climate change mitigation in agriculture (Afterres 2050, (Solagro, 2011), Carbon efficient farming, etc.), it has not yet been proven which would be the most efficient.

11. Our own calculation based on FAO statistics. Lack of available data between 1961 and 2010 led us to calculate for 19 countries out of 27. In 2010, these countries represented 93% of the EU27 population and 96% of cereal production.

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# Biodiversity and agricultural systems in Europe: drivers and issues for the CAP reform

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