

GREENING THE COMMON AGRICULTURAL POLICY: PAST EXPERIENCES AND  
FUTURE CHALLENGES TOWARD MULTIFUNCTIONAL AGRICULTURE

BY

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THESIS

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## ABSTRACT

Over the past decade, scientific and policy circles throughout Europe have been debating about how to best create working landscapes that balance agricultural production and environmental conservation in an economically sustainable fashion. In this regard, multi-functional landscape strategies have been perceived as a powerful instrument to help the European Union achieve its sustainable development goals. In an attempt to put these ideas in place, past reforms to the Common Agricultural Policy (CAP), and more recently the CAP post-2013 reform, contain a set of environmental standards and objectives that aim to improve overall environmental sustainability of European farms. This study examines the current CAP environmental standards both from conservationist and rural development perspectives, seeking to identify whether such measures can most successfully foster the concept of multi-functionality. Through an analysis of the legislative history of the CAP reform process, as well as a review of the literature on the conceptual frameworks to multifunctional agriculture, and particularly exploring the role of institutions in driving environmentally sustainable farming systems across the EU, the research findings suggest that environmental objectives have only been partially integrated into the CAP, either because of their limited scope or their unsuccessful implementation. At the policy level, these findings question the effectiveness of EU policy efforts to use CAP subsidies as an instrument to deliver environmental goals and contribute to the multiple functions of agriculture. CAP environmental objectives have to a considerable degree remained fragmented, which reinforces the need to promote more integrative policy approaches as a way to explore the potentials of multi-functional agriculture in all its complexity, and to achieve broader sustainability and rural development goals.

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## List of Abbreviations

AEI	Agri-environmental Indicators
AES	Agri-environment Schemes
BPS	Basic Payment Scheme
CAP	Common Agricultural Policy
CEC	Commission of the European Communities
CGAEP	Code of Good Agricultural and Environmental Practice
CJEU	Court of Justice of the European Union
CMEF	Common Monitoring and Evaluation Framework
COM	Commission
Defra	Department for Environment, Food & Rural Affairs
EAFRD	European Agricultural Fund for Rural Development
EAGF	European Agricultural Guarantee Fund
EAGGF	European Agricultural Guidance and Guarantee Fund
EC	European Commission
ECA	European Court of Auditors
ECJ	European Court of Justice
EEA	European Environmental Agency
EEC	European Economic Community
EERP	European Economic and Recovery Plan
EFA	Ecological Focus Area
EIA	Environmental Impact Assessment
ELS	Entry Level Stewardship
EP	European Parliament
ESP	Environmental Stewardship Program
EU	European Union
IACS	Integrated Administration and Control System
IEA	International Energy Agency
IEEP	Institute for European Environmental Policy
IPCC	Intergovernmental Panel on Climate Change
ISCC	International Sustainability and Carbon Certification
FAO	Food and Agriculture Organization of the United Nations
FACCE-JPI	Joint Programming Initiative on Agriculture, Food Security and Climate Change
FAS	Farm Advisory System
FSI	Forest Stewardship Council
GAEC	Good Agricultural and Environmental Conditions
GHG	Greenhouse Gases
GMO	Genetically Modified Organisms
HLPE	High Level Panel of Experts on Food Security and Nutrition
HLS	Higher Level Stewardship
HNV	High Nature Value
LCFS	California Low Carbon Fuel Standards

LFA	Less Favored Areas
LFASS	Less Favorable Areas Support Scheme
LPIS	Land Parcel Identification System
LUC	Land-use Changes
MFF	Multi-annual Financial Framework
ND	Nitrates Directive
NFU	National Farmers Union
NGO	Non-governmental Organization
NTC	Non-trade Concerns
NVZ	Nitrate Vulnerable Zone
OECD	Organization for Economic Cooperation and Development
ÖLN	Ökologischer Leistungsnachweis
PES	Payment for Ecosystem Services
RBMP	River Basin Management Plan
RDP	Rural Development Program
RDR	Rural Development Regulation
RED	EU Renewable Energy Directive
RSB	Roundtable for Sustainable Biomaterials
RSPB	Royal Society for the Protection of Birds
SAC	Special Areas of Conservation
SAPS	Single Area Payment Scheme
SFS	Small Farmers Scheme
SME	Small and Medium Enterprises
SMR	Statutory Management Requirements
SPA	Special Protection Area
SFP	Single Farm Payment
SPS	Single Payment Scheme
TFEU	Treaty on the Functioning of the European Union
UAA	Utilizable Agricultural Area
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment and Development
USDA	US Department of Agriculture
WHO	World Health Organization
WFD	Water Framework Directive
WTO	World Trade Organization
WHO	World Health Organization
WFD	Water Framework Directive
WTO	World Trade Organization

# Chapter 1

## CONTEXTUALIZING THE CHALLENGES FACING AGRICULTURE

*“Agriculture is the dilemma of civilization because it both separates us from nature and connects us to it; it both makes civilization possible and puts it at risk [...] Agriculture has not only made civilization and ourselves, it has made and remade the surface of the entire globe. To ponder the usefulness, beauty, and health of even a tiny section of that globe, we must ponder agriculture deeply and at length.”*

*(Jane Smiley)*

The expansion of agriculture has been widely recognized as one of the most significant human alterations to the global environment. Over the past 300 years, total cropland has increased 466 percent (Goldewijk, 2001), making agriculture the world’s main land-use. More than one third of the planet’s total available land is currently used for agriculture (Alexandratos & Bruinsma, 2012). The expansion of extensive farming practices across space and time has helped create and maintain a variety of valuable semi-natural habitats

and agricultural landscapes, areas that host a wide range of plant and animal species, and support a socially diverse rural community. A more recent cite, however, suggest that the intensification of farming management and the increase in average farm size have threatened the environment and interfered in important ecosystem functions and services (Richards, 1990).

While acknowledging these dynamics, this study will look into the role of government policies on shaping agricultural production and development in a way that addresses environmental and socioeconomic sustainability concerns. More specifically, this thesis looks into past and current policy efforts in the EU to revert the trend of environmental degradation driven by the process of agricultural intensification supported by subsidies provided to farmers over the past decades.

Over the past 50 years, global gross agricultural output has more than tripled in volume, outstripping the pace of human population growth, while the amount of land devoted to arable farming globally has increased by only 9 percent (Tilman, 1999; Matson et al., 1997; and Godfray et al., 2010). This has been accomplished through large investments in agricultural productivity, particularly through the use of high-yielding crop varieties, chemical fertilizers and pesticides, irrigation, and mechanization (Matson et al., 1997). The massive public financing of agricultural modernization through subsidies, and the unprecedented employment of research and technology on a large-scale have significantly contributed to this process. Besides reducing the demand for new land as a factor of production, agricultural intensification has also enabled food to become more abundant and cheaper, thereby improving access of the world's population to affordable food prices and stable markets, and

contributing to global food security (OECD/FAO, 2012).

At the same time, intensification of arable farming has exacerbated the status of environmental degradation of the world's most valuable ecosystems. Numerous scientific studies and environmental assessments exploring these impacts across scales have revealed alarming findings. These include increased levels of soil erosion and lower soil fertility (Whitbread et al., 1998; and Stoate et al., 2001), biodiversity loss (Butler et al., 2010; Donald et al., 2001, Robinson & Sutherland, 2002), ground water pollution and eutrophication of rivers and lakes (Grizzetti et al., 2007; Csathó et al., 2007; and EEA, 2010a), and copious amounts of greenhouse gas emissions and impacts on climate (Schulze et al., 2009; and Ciais et al., 2010). This unprecedented level of environmental crisis has led scientists, policymakers, and civil society to raise concerns over the long-term sustainability of intensive agricultural systems, and triggered public and private debates over the need to reduce the environmental footprint of agriculture, while maintaining adequate nutrition.

With global human population projected to surpass 9 billion by 2050, and per capita caloric intake expected to increase by nearly one-third in emerging economies, demand for agricultural products is estimated to go up 60 percent in the next four decades from its 2005-2007 levels (Alexandratos & Bruinsma, 2012). At the same time, nearly 1 billion people continue without access to sufficient protein and energy from their diet, and even more suffer from some form of micronutrient malnourishment (Godfray et al., 2010; and OECD/FAO, 2012). Furthermore, the world's capacity to produce food and other agricultural products is expected to suffer from the potential effects of anthropogenic climate change, including impacts on crop yields (Olesen & Bindi, 2002), more extreme and unpredictable weather

events, and shifts in land suitability (Zabel et al, 2014). Irrigated agriculture also may face constraints on the availability of water as it accounts for nearly 70 percent of all water withdrawals globally (OECD/FAO, 2012).

When designing future policies that address how to meet the rising demand for agricultural output and the global food security puzzle, policy-makers will have to face fundamental challenges as agriculture will be constrained as never before by the Earth's finite resources. This will require efforts beyond the business-as-usual increase in agricultural productivity as other environmental shortfalls in the food and farming systems still need to be closed (Godfray et al., 2010). Investments in agricultural research and development are key to develop cost-effective solutions that also halt environmental degradation and restore fragile ecosystems. Policies that provide economic incentives for producers, strengthen rural education and agricultural extension services, and improve rural infrastructure and access to markets also are urgent.<sup>1</sup> Policy solutions from a consumer perspective will have to include efforts to reduce global food waste both in developed and developing nations, as roughly 30 to 40 percent of all food produced globally is lost to waste (Godfray, 2010). Public and private efforts may consider the need to educate society about the environmental and health implications of animal-protein-based diets; obesity and over-nutrition is an epidemic that currently affects more than 1.5 billion people around the world, and has become the number one cause of death in the US (OECD/FAO, 2012; and US DHHS, 2012). Worldwide, obesity levels have nearly doubled over the past 30 years, particularly among the poor, exposing

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<sup>1</sup>Especially in developing countries, where reliance in food imports are predicted to sharply increase in the following years (OECD/FAO, 2012; World Bank; and USDA).

the world to the double burden of malnutrition and obesity.<sup>2</sup> Efforts to encourage shifts in diets and reduce global consumption of animal products may offer an opportunity to feed more people with less land and provide other environmental and health benefits (Pray et al., 2014).<sup>3</sup>

These are unprecedented challenges facing humankind, the environment, and agriculture that are presented here to put into perspective the linkages between agriculture and the environment's limited capacity to fulfill modern societies needs, aspirations and well-being. Today, these linkages are better understood - although not yet fully explored and assimilated - and have been the object of on-going research and policy debates (Clark, 2002). The world is witnessing a moment of transition, where governments, private entities, civil society and other stakeholders must combine efforts at the energy, environment and agriculture nexus to address these complex environmental and societal challenges.

Consensus is growing that meeting the food, feed, fiber, energy and industrial needs of an overpopulated world while reducing the environmental footprint of agriculture must be accomplished sustainably, primarily by utilizing existing (or even less) land and natural resources to increase production (IPCC, 2014 and OECD/FAO, 2012). One way to accomplish this would be through the *sustainable intensification*<sup>4</sup> of agriculture. Using agricultural

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<sup>2</sup>The links between food insecurity and obesity is one that researchers have explored over the past decade, trying to understand their relationships to poverty and to other potential drivers. For more details see Godfray et al., 2010.

<sup>3</sup>About one-third of global cereal production is fed to animals. Therefore, reducing the consumption of meat, will lead to a reduction on the demand for feedstock, freeing up land that could be used to produce food to feed humans and source the world's increasing demand for bioenergy and biomaterials. Furthermore, according to the World Health Organization (WHO), well-balanced diets rich in grains and other vegetable products are considered to be healthier than those containing a high proportion of meat (especially red meat) and dairy products.

<sup>4</sup>The term *sustainable intensification* was initially used in the mid-1990s in the context of developing food production in Africa. It was also one of the five core themes used by the European Union Agriculture, Food Security and Climate Change Joint Program Initiative (FACCE JPI): "Environmentally sustainable growth

subsidies to promote best management practices has also been seen as a powerful strategy.

Concerns over the *sustainability, renewability, greenness, fairness, environmental feasibility* of sourcing materials have become central to many governments, civil society and businesses (Backstrand, 2006; Van Dam et al, 2008; UN, 2014; and Pattberg, 2012 ).<sup>5</sup> One sector under particular scrutiny has been the biofuels sector where producers have been required to observe sustainability standards as a pre-condition to access some markets.<sup>6</sup> Also, in the food and forestry industries,<sup>7</sup> groups have set voluntary targets for sustainable sourcing as a response to market/consumers demand (Endres, 2011). Defining what it means to be sustainable from an environmental, social and economic perspectives, however, requires further refining in policy, research and practice.

The Brundtland Report (1987) is recognized as the first attempt to formally define *sustainable intensification of agriculture*” (Franks, 2014). Generally, *sustainable intensification* can be achieved through *land sharing* and *land sparing* approaches. There is an on-going debate about which one of these strategies produce the best of agriculture and ecosystem services. While in *land sparing* homogeneous areas of farmland are managed to maximize yields offsetting separate reserves to target biodiversity conservation, *land sharing*, by contrast, integrates conservation and production within more heterogeneous landscapes. Different scientific world views underpin the two approaches, and have shown unique advantages and disadvantages. Finding the appropriate balance between these two strategies, however, may present some challenges, and should take into account site-specific aspects such as natural constraints, institutional and governance arrangements, socio-economic dynamics, and historical land-use patterns (Franks, 2014).

<sup>5</sup>Private companies are taking the lead by transforming their business models for sustainable development. But there is plenty of space to be explore and further efforts to be made, as the world has only scratched the surface of the potential for ethics-driven investment by the private sector. With the right incentives, policies, regulations and monitoring in place, great opportunities may emerge. In the bioenergy and forestry sector, discussions on sustainability have been refined over the years and gained space in public policies and legislation. For instance, bioenergy policies such as the EU Renewable Energy Directive (Directive 2009/28/EC) and the California Low Carbon Fuel Standard (LCFS) have contained requirements to address sustainability concerns. Also, in China, India and South Africa, laws and policies provide clear clauses to avoid biofuels pathways that directly affect food security (Gasparatos et al., 2013). Private standards and certification regimes have emerged to address consumers concerns over the sustainability of various products. These include, for example, the Roundtable on Sustainable Biomaterials (RSB), the Sustainable Forestry Initiative (SFI), the Forest Stewardship Council (FSC), the International Sustainability and Carbon Certification (ISCC), and Bonsucro.

<sup>6</sup>Requirements set by government mandates, such as the EU Renewable Energy Directive and the California Low Carbon Fuel Standards.)

<sup>7</sup>For example, Unilever, Coca-Cola, Walmart, Roundtable for Responsible Soy, Sustainable Forestry Initiative.

*tainable development* as that which “meets the needs of the present without compromising the ability of future generations to meet their own needs”. In the biofuels sector, bioenergy laws and several voluntary standard initiatives have designed ways to address the environmental and socioeconomic aspects of increased biofuels production. These public and private standards usually contain principles governing air quality, water and soil quality and quantity, GHG emissions, biodiversity, land conversion, and socioeconomic considerations (Endres, 2011).<sup>8</sup> Some scholars have also developed a list of recommended indicators to assess socioeconomic aspects of sustainability of biofuels beyond job creation (Dale et al., 2013).

Lessons learned from biofuels sustainability efforts can inform and support the development of sustainability science and practice in agriculture in general. Perhaps one of the biggest challenges moving forward will be to ensure that standards implementation and verification relies on the use of scientifically-verifiable and objective measurements. This will require detailed farm-level information, efforts to foster the exchange and publicity of large datasets for scientifically-sound analyses, and addressing questions about public disclosure of confidential business information that might emerge in legal disputes. If the ultimate goal of sustainability is to ensure continuous improvement of environmental and social conditions, information and lessons learned in standards implementation must be channeled back into adaptive management to ensure that outcomes match sustainability aspirations (Endres et al., 2015).

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<sup>8</sup>Such standards allow for a comparative process to determine whether one set of actions may be better than another based on criteria set by society through a transparent political process following principles of good governance. For more detail *see* Endres et al. (2015).

More than ever, non-state actors such as business, non-governmental organizations (NGO), and civil society have become increasingly important and influential actors in both public and private regulatory processes (Fuchs, 2003; McAllister, 2012; Endres, 2012). A multifaceted environmental governance system where multiple stakeholders interact and share responsibilities has replaced the top-down, government-centric regulatory system<sup>9</sup>. In this new system, governments play a facilitatory role in providing the institutional framework for decision-making through the structuring of incentives and baseline regulatory constraints (Fuchs, 2003).

In the European Union, the institutional framework for agri-environmental standards has been set by both general environmental directives and agri-environmental standards tied to agricultural subsidies. In order to justify government intervention and address agriculture's environmental problems, agri-environment standards have been progressively integrated into the CAP. Well-known for taking a precautionary stance toward environmental, food quality and animal welfare issues, the EU is often recognized as a leading actor in international environmental policy. Acting as a normative power (Manners, 2002), the EU has helped shape international negotiations and influenced other countries' approaches to environmental and climate change agreements. Therefore, understanding the ways in which EU institutions have supported environmental decision-making in agriculture and fostered the sustainability debate comes hand in hand with a global questioning of our current economic model and the challenges of establishing a sustainable global economy.

Despite recent efforts to green the CAP, the first three decades of CAP intervention

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<sup>9</sup>where state actors were vested with the exclusive authority to set the standards, impose sanctions and establish stringent criteria of acceptable behavior

mechanisms completely neglected agriculture's environmental externalities and set the pace of agricultural modernization across EU farmland. Implemented in a period of great economic instability, CAP market intervention mechanisms were seen as a way to increase agricultural productivity, ensure a fair standard of living for farmers, assure availability of food supplies and ensure reasonable food prices for consumers (Article 39 of the TFEU; and Zobbe, 2001). In the 1960s, agriculture employed some 25 percent of the EU-6 workforce, and in some countries (e.g. Italy) 40 percent of the population benefited from CAP funding (Staab, 2011, 116). Every product was guaranteed a price higher than the world-market price, giving farmers all the incentives to produce more (Staab, 2011, 117). Because guaranteed prices bear no relation to demand, CAP price support schemes stimulated intensification of farming, leading to overproduction and significant environmental and social impacts (Stoate et al., 2001).

For many years, the CAP was the only common European community policy governed at the EU level, and served as an important instrument of EU integration (Staab, 2011). However, as other policy agendas (e.g. foreign policy and finance) started to draw increasing attention, the CAP lost its centrality in EU policy-making, presenting even increasing pressure against large yearly budgets. This process coincides with a significant downturn of the economic preeminence of the agricultural sector, which employs today only 5 percent of the EU-27 workforce and contributes to only 1.2 percent of its total gross domestic product (EP, 2013; and Barthelemy & Vidal, 1999).

Despite this, the CAP continues to be at the core of the EU financial negotiations as the Union's single largest item of expenditure. Some 38 percent of the recently agreed upon

EU Multi-annual Financial Framework (MFF) has been allocated to support CAP direct payments and rural development programs.<sup>10</sup> These changing political, socio-economic and environmental contexts in which CAP negotiations are embedded have triggered discussions about how to best use agricultural subsidies to address the current challenges faced by agriculture. Over the past decades, political reforms to the CAP framework have attempted to raise the prominence of environmental protection in EU agriculture and ensure farmers are compensated for the public goods and services they provide. Underpinning these policy measures is the *multifunctionality paradigm*, which holds that agriculture should be valued not only in terms of the food it supplies, but also in terms of its contribution to the maintenance of a rural population, and the preservation of the countryside, its traditions, social, cultural and natural values.

The concept of multifunctional agriculture has emerged as a key notion in scientific and policy debates on the future of agriculture and rural development. In the literature, *multifunctionality* has been conceptualized following four main categories of research approaches (Renting et al., 2009). The first follows a *market-regulation approach*, which gives particular attention to the economic aspects of *multifunctionality* and to governance mechanisms for structuring markets for the non-commodity outputs of agriculture (OECD, 2001 and 2003).

The second consists of the *land-use approach*, which addresses spatial aspects and the territorial level as important elements for the design of multifunctional landscapes.<sup>11</sup> Mod-

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<sup>10</sup>Council Regulation (EU, Euratom) No 1311/2013 of 2 December 2013 (OJ L 347, 20.12.2013, p. 884) based on the political agreement reached in June 2013 by Parliament, the Council and the Commission (vote in Parliament on 20 November 2013 - resolution P7\_TA(2013)455).

<sup>11</sup>Land-use approaches to *multifunctionality* originate mostly from the natural sciences disciplines such as landscape and conservation ecology, production ecology, geography, and land-use planning. Its strength lies in adding a spacial dimension to analysis of *multifunctionality*. However, similar to other approaches, land-use approaches to *multifunctionality* have a number of limitations. These limitations mostly concern

eling plays a big role here, but is usually applied at the aggregated level (Groot et al., 2009; and Lovell & Johnston, 2009).

Third is the *actor-oriented approach*, giving central attention to multifunctional agricultural issues at the farm level and, in particular, to decision-making processes of actors in the social construction of multifunctional agricultural practices (Harden et al., 2014; and Dale & Kline, 2014).

Finally, the *public-regulation approach* gives central attention to institutional and policy aspects of multifunctional agriculture, departing from the prominent role of public institutions in structuring and regulating the management of public goods to achieve desired outcomes (Potter & Tilzey, 2005; Laurent et al. 2006; Renting et al, 2009; Potter, 2004; Abler, 2004; and Abramovay, 2002).

Drawing from all of these approaches, this thesis investigates the extent to which CAP institutional arrangements have fostered the concept of *multifunctionality* and supported European farmers on their task to reconcile agricultural production and environmental conservation.

Driven both by neoliberal commitments set under WTO agreements on agriculture, and seeking to promote and compensate environmental public goods provided by agriculture,<sup>12</sup> the multifunctionality paradigm has been seen as a way to move the CAP more toward the principle of “public money for public goods” (Matthews, 2013b). As part of this process,

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the difficulties: (i) in addressing synergies resulting from combinations of multiple functions at farm level, amongst farmers or between agriculture and other land-uses; (ii) the limited role social processes underlying land management practices play in the analysis; (iii) and the fact these analysis only focus on multifunctional land-use rather than on multifunctional agriculture.

<sup>12</sup>These include landscape and open-space amenities, cultural heritage, rural economic viability, domestic food security, prevention of natural hazards, groundwater resource recharge, preservation of biodiversity, greenhouse gas sinks, etc.

reforms have been implemented to fully decouple CAP payments from production levels<sup>13</sup>, and re-balance CAP expenditures through *modulation*.<sup>14</sup>

These reforms have been established following an layered process, based on the building of specific policy instruments on top of others to address issues as diverse as food production, world trade, sustainability, rural development, renewable energy and climate change. On the extreme side of the policy debate are farmers unions and environmental organizations, who have become influential actors shaping negotiations (Medina & Potter, 2014). While farmers have embraced the concept of *sustainable intensification* as a way to reconcile production and conservation, environmental groups have stressed the multifunctionality paradigm to push for further integration of ecosystem services protection within CAP supporting schemes (Medina & Potter, 2015). Even though both groups agree agriculture should continue to rely on public financing, there is a fundamental divergence on the way they believe the budget should be spent (Medina & Potter, 2015). On one hand, farmers seek the CAP income supporting system to be maintained with minimum environmental obligations. Environmental groups, on the other hand, believe subsidies should be strategically used to promote environmental protection through standards and targeted agri-environment schemes (Boatman et al., 2008; Broughton et al., 2014; Garibaldi et al., 2013; and Pywell et al., 2012). This historical process of multi-layered accommodation of competing approaches into the CAP has created inherent tensions and made negotiations much more susceptible to outside pressure.

The CAP greening process began in 1992, when the MacSharry reform introduced for the

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<sup>13</sup>Shifting subsidies away from a price support system to implement farmers' income support payments.

<sup>14</sup>The term *modulation* refers to the the process of progressively transferring money from Pillar 1 (direct payments) to Pillar 2 (Rural Development Agenda).

first time the “protection of the environment and the development of the natural potential of the countryside” as one of its main objectives (Grossman, 1994). Every time a new CAP agreement is up for negotiation, EU institutions have an opportunity to decide where to set the environmental baseline in European agriculture. The last round of negotiations was initiated by the Commission’s greening strategy which promised to raise the environmental bar of *cross-compliance* and proposed additional *greening measures* to be tied to 30 percent of direct payments. The final rule agreed in 2013 substantially watered down several aspects of the Commission’s proposal, and is perceived as a missed opportunity to pursue further greening in both pillars of the CAP (Matthews, 2013b).

This study explores the process by which environmental objectives have been integrated into the CAP, and whether agri-environment measures implemented through CAP transfers have successfully fostered the concept of multifunctional agriculture. Combining the four major approaches to *multifunctionality* this research investigates the efficacy of EU institutions in supporting farmers in transitioning to a more environmentally, socially and economically sustainable agricultural model. Particular focus is placed on regulation at the nexus of environmental, agricultural and energy policy.

In order to answer this research question, this thesis is divided into five main chapters. In addition to this introduction and the following section describing the methods, chapter 3 presents a brief summary of recent studies exploring environmental externalities in European agriculture and situates the reader in terms of the relevance of the sustainability issues explored in this study. The following chapter 4 is devoted to the exploration of the role of public policies in promoting agricultural multi-functionality, and investigates whether and

how institutions have supported European farmers in their challenging task to reconcile increasing global demand for agricultural output with conservation goals set under the EU 2020 sustainable development strategy. Chapter 5, then identifies past and present policy efforts to green the EU Common Agricultural Policy, with an emphasis on the recent CAP reform negotiations. The UK is used as a case-study to identify challenges and opportunities in implementation. Chapter 5 ends with recommendations for future policies, highlighting the need for more integrative policy approaches that can fully explore CAP subsidies in order to deliver the potentials of multifunctional agriculture in all its complexity, and as a way toward sustainable rural development. Final conclusions are then summarized in chapter 6.

# Chapter 2

## METHODOLOGY

In order to answer the research questions this work uses the following methods. First, a review of the literature on the conceptual frameworks to multifunctional agriculture is provided to identify the different approaches used in various scientific fields, and explore how these notions have been translated into recent reforms of the EU's Common Agricultural Policy (CAP). In particular, this study draws from the public-regulation literature on multifunctionality to investigate the role of the EU institutions and Member States in promoting the provision of public goods and services in agriculture.

Second, it analyzes the CAP greening process by reviewing its legislative history to identify how past reforms have addressed major environmental and social problems arising from unsustainable farming practices. In addition, it examines how the implementation of CAP environmental objectives has fostered the concept of multi-functionality, both from an environmental and rural development perspective. Specifically, it focuses on the last five CAP reforms as they have introduced some level of environmental protection into agricultural subsidies. These are the 1992 (MacSharry reform), the Agenda 2000, the 2003 Mid-term reform, the 2008 Health Check, and the most recent Post-2013 reform. A detailed analysis of

the implementation process at the Member State level is presented using the United Kingdom as a case study. Other references are made to other Member States where appropriate.

Lastly, lessons learned from interactions with experts and relevant stakeholders in the fields of agri-environment law and policies and bioenergy certification have helped confirm some research findings. Semi-structured interviews were conducted in field level analysis both in the UK (East Anglia University and Imperial College London) and in the Netherlands (Wageningen University).<sup>15</sup> Experts from these well-known institutions with substantial knowledge on these subjects have provided valuable materials, and significantly contributed to the development of this thesis, especially by sharing their understanding of how multifunctionality has helped shape CAP negotiations over the years. Furthermore, their collaborations were also helpful in terms of situating EU agricultural policies in relation to other sectorial policies, particularly bioenergy.

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<sup>15</sup>Field research was supported by the 2013/2014 European Union Center of Excellence Graduate Student Travel Grant, via an European Union grant to the University of Illinois.

## Chapter 3

# AGRICULTURAL ENVIRONMENTAL EXTERNALITIES IN EUROPE

*“One of the basic assumptions of the new agriculture is that humans can and should manipulate nature at its very foundations for the sake of feeding as many humans as possible.” (Jane Smiley, 1997)*

Since the establishment of the first agricultural societies in Europe in the mid-Holocene, humans have substantially altered the European landscape (Kaplan et al., 2009). The clearance of forests and woodlands to open up areas for agricultural development, and to source energy and increasing demand for construction materials has been one of the most evident and influential drivers of anthropogenic land use changes (LUC). The effects of these changes on global climate are currently the subject of a lively debate (Kaplan et al., 2010).

Although the process of human interference in the global environment has exacerbated particularly over the past 300 years (Goldewijk, 2001), research suggests that some European regions also may have experienced successive cycles of deforestation, abandonment, and

afforestation throughout the centuries preceding the Industrial Revolution (Kaplan et al, 2009). This process of long and continuing human alteration of our global environment has had important implications for local, regional, and global ecosystems dynamics, and contains lessons for understanding what constitutes environmental sustainability, and the kind of policy solutions that may be required moving forward.

Over the last hundred years, and particularly since the mid-1900s, drivers of agricultural development<sup>16</sup> have led to widespread agricultural improvements and the intensification of land management practices across all EU Member States.<sup>17</sup> The process of agricultural intensification consists of an increased application of chemical inputs such as fertilizers and pesticides, increasing scale and mechanization of farming operations, and simplification of agricultural systems. Since 1945, the number of farms has declined 65 percent, and farm labor dropped 77 percent, while yield increased almost fourfold across the EU (Robinson & Sutherland, 2002). Although small-scale, extensive mixed farming systems still survive in many parts of the European countryside, particularly in the South and Central-East, they have suffered increasing pressure from market-oriented policies to become more intensified.

Today, agriculture accounts for the largest share of land use in Europe, with nearly 50 percent of the EU's total land currently farmed. As the major land-use system, agriculture greatly influences the design and conservation status of arable and non-arable landscapes across the whole EU. Particularly, recent intensification has severely threatened the quality

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<sup>16</sup>Such as rising prices and commoditization of food markets, technological advances and market measures supported under the EU Common Agricultural Policy.

<sup>17</sup>Although intensive and large scale agriculture is a feature commonly associated to Western European Member States, since 1990s rapid moves toward both intensification and abandonment have started to take place also in Eastern Europe, with EU integration efforts greatly influencing the rate of this change (Stoate et al., 2001).

of natural and arable landscapes across Europe.

Because unsustainable agricultural practices have implications that go beyond the farm-gate, society as a whole has borne the environmental and social costs of intensification (Stoate et al., 2001). An extensive body of research has provided evidence on the environmental and social sustainability concerns of modern agriculture. These scientific contributions have fueled policy debates and public opinion on the environmental externalities of agriculture. Among these externalities are habitat and biodiversity loss, soil degradation, and water and air pollution.

A combination of *abandonment* of agricultural production and land *intensification* has been identified as the main drivers of declines in the area of natural and semi-natural habitats across the whole EU. Around 47 percent of all European agricultural sites suffer from land *abandonment*, whereas *intensification* is a major threat to 43 percent of them (EEA, 2009).

Extensive farmland *abandonment* is a phenomenon driven by a complex range of factors that undermine the viability of farming under certain land use and socio-economic contexts (Keenleyside & Tucker, 2010). Among the main drivers of land abandonment are *ecological* elements (e.g. constraints to productivity and mechanization posed by geographical factors such as steep slopes or low soil fertility), *socio-economic* conditions (e.g. declining meat prices, labor and time constraints, poor access to markets, aging and decreasing rural populations due to increased urbanization), and *land mismanagement* factors (soil erosion) factors (IEEP & Veenecology, 2004; and Keenleyside & Tucker, 2010). The *abandonment* of agricultural land represents a change of land use, a complex phenomenon that can bring about both positive and negative consequences. Among the potential impacts of land *aban-*

*donment* identified by Benayas et al. (2007) are: reduction of landscape heterogeneity, often associated with increased fire frequency, soil erosion and desertification, reduction of water stocks, biodiversity loss, and loss of cultural and aesthetic values. Abandoned land, particularly in marginal areas with reduced environmental value, is unlikely to recover to historical vegetation status through natural succession, and may require active restoration if the system is to sustain diverse animal and plant species, and provide ecosystem services when management intervention is lost. Active restoration of these areas, however, may pose significant scientific and policy challenges.

On the other hand, replacement of extensive farming with more intensified systems has threatened key European farmland habitats and species of community interest, with consequent disruption to food chains and declines in many farmland species (IEEP & Veenecology, 2004; Keenleyside & Tucker, 2010; Poláková et al, 2011; and Zimmermann et al, 2010). Four main types of habitats have been particularly impacted, among them grasslands, woodlands, several types of wetlands and peatlands, and small farmland habitats and landscape features (e.g. meadows, hedgerows, stone walls) (Robinson & Sutherland, 2002; Wilson 1992).

Sharp declines in farmland bird populations (a good indicator for wider biodiversity health) have also been observed across Europe, representing a severe threat to biological diversity (Donald et al., 2001; Robinson & Sutherland, 2002).<sup>18</sup> Besides threatening plant and animal communities (Donald et al., 2001; Meeus, 1993; and Robinson & Sutherland, 2002), farming *intensification* has also been associated to impacts on soils (Manlay et al.,

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<sup>18</sup>Donald et al. (2001) show that 30 percent of the variance in farmland bird declines across EU countries can be solely explained by changes in cereal yield, as a result of more intensive crop- and livestock-husbandry practices.

2007; and Baldock & Mitchell, 1995), air pollution (Schulze et al., 2009), surface and ground water depletion (Burt et al. 2010), and created highly modified and less-diverse agricultural landscapes.

Decline in soil quality also has been attributed to *intensification* of agriculture incentivized by market measures established under the Common Agricultural Policy (CAP). With little incentives to implement soil conservation measures, European farmers have contributed to the deterioration of soils as a result of erosion, compaction, loss of organic matter, and contamination with pesticides<sup>19</sup> and heavy metals (Baldock & Mitchell, 1995; Boardman et al., 1990; and Ingram & Morris, 2007). During the last 40 years, nearly 1/3 of the world's arable land has been lost to erosion and continues to be lost at a rate of more than 22 million acres per year (Pimentel et al., 1995). In the EU, more than 15 percent of its territory is currently affected by a significant level of soil erosion, which has led to a €3.5 billion loss in agricultural production (Louwagie et al., 2009).

Impacts on soil have been closely related to those on water, as nutrient and pesticide pollution of water results from surface runoff and subsurface flow of chemical inputs (Ingram & Morris, 2007). Despite improvements in some regions, diffuse water pollution from agriculture remains a major environmental problem in many parts of Europe. Today, non-point source pollution affects more than 40 percent of rivers and coastal water bodies in the continent (EEA, 2015; and EEA, 2007). In particular, nutrients (nitrogen and phosphorus) from agricultural fertilizers and pesticides, and pollution from manure are regularly detected in aquatic environments at excessive levels, causing eutrophication, resulting in changes in

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<sup>19</sup>While pesticides protect crops from damage caused by weeds, diseases and insects, they can harm people, wildlife and the environment.

species abundance and diversity, as well as algal blooms, deoxygenated dead zones, and leaching of nitrate to groundwater.<sup>20</sup> All of these changes threaten the long-term quality of aquatic environments, and have implications for the provision of ecosystem services such as drinking water, fisheries, recreation opportunities, and agriculture. Achieving improved water quality requires meeting certain standards for the ecology, chemistry, morphology and quantity of waters (CEC, 2012). Therefore, water quality and quantity are directly linked.

Besides being the main source of nutrient pollution, agriculture is also a major source of water withdrawal. It accounts for over 44 percent of total water use in Europe. Irrigation of crops constitutes the major water use in agriculture, especially in southern Member States where many crops rely on irrigation technology, and over-abstraction remains an issue. Managing water use in agriculture has, thus, become one of the key themes relating to water scarcity and drought in the EU.

*Intensification* of arable farming also has been associated with air pollution, namely greenhouse gases (GHG) such as methane (CH<sub>4</sub>) from animal manure, nitrogen dioxide (NO<sub>2</sub>) from chemical inputs, and carbon dioxide (CO<sub>2</sub>). Currently, agriculture responds for about 9 percent of total EU GHG emissions (down from 11 percent in 1995; *see* Freibauer, 2003). Methane (CH<sub>4</sub>) contributes to 49 percent of all GHG emissions in agriculture, and 75 percent of it comes from the livestock sector (BirdLife, 2012). Carbon emissions from transport and fertilizer application for land management have also contributed to total emis-

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<sup>20</sup>Traditionally, soil fertilization practices in Europe used to rely mainly on low-cost biological fixation of nitrogen and the relatively high nutrient capital of the soils. Up until the second half of the 20th century, mineral fertilizers did not account for more than 15 percent of nutrients utilized by crops, and even in 1940, in the economic context of recession and World Wars, they played only a limited contribution to the second agricultural revolution. For more information *see* Manlay et al. (2007).

sions (Schulze et al., 2009).<sup>21</sup> Moreover, the loss of soil organic matter has also reduced the system's capacity to sequester carbon.

Agriculture may also face unprecedented challenges posed by climate change, including shifts in land suitability, reduced crop-yields, and water shortages. Recent estimates suggest that total cropland is likely to shrink by 1.7 million square kilometers across all regions of the EU (including protected areas and dense forest) (Zabel et al., 2014). Although warmer and wetter conditions are expected to make some previously uncultivable areas suitable for agriculture (e.g. in the Scandinavian Member States),<sup>22</sup> overall, total suitable land is expected to decline in the continent. The area that may face the greatest loss of suitability is the Mediterranean region, one of the most important for European agriculture, where total suitable land is expected to decline by 0.7 million square kilometers.

Although agriculture is not the only land-use system damaging the environment, it is clearly the one that will most suffer the consequences of climate change and environmental disturbances, as it directly relies on the ecological functions provided by natural ecosystems. Because agriculture cannot be sustained in isolation from its surrounding environment, it must be planned and managed in a way that minimizes its social and environmental impacts (Jongman, 2002). From this perspective, efforts to reconcile environmental conservation and the sustainable intensification of agriculture have become central to European agricultural policies.

Increasing attention has been given in policy and research to understand and mitigate

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<sup>21</sup>These are low estimates because they do not include the production costs of pesticides, the heating cost of greenhouses, cooling of storage rooms and other indirect energy needs.

<sup>22</sup>According to the same study, 0.21 million square kilometers of land could become available for agricultural production in this region.

environmental impacts in agriculture and improve resource-use efficiency. Addressing these issues requires redirecting public subsidies toward encouraging the positive externalities of agriculture that have been under-provided in the market place, combined with a mix of advisory and institutional mechanisms, regulatory and legal measures, and economic instruments to correct negative externalities. Public and private investments in technology and innovation, and the establishment of partnerships among multi-stakeholders are crucial to facilitating this process.

In today's plural environmental governance regimes, governments play a key role in setting the institutional frameworks to promote the sustainability of resource use by state and non-state actors through the structuring of incentives and constraints (Fuchs, 2003).

In order to situate the reader in the debate, the following chapter will discuss some theoretical basis for the role of institutions in shaping private rights to protect public goods. Chapter 4 will also present a theoretical framework to the concept of multifunctional agriculture which will illuminate further discussions on the use of agricultural subsidies to compensate the non-commodity outputs of agriculture (e.g. environmental and social goods), a discussion that has become increasingly influential in the implementation of CAP environmental measures.

## Chapter 4

# THE ROLE OF PUBLIC POLICIES IN PROMOTING AGRICULTURAL MULTI-FUNCTIONALITY

### 4.1 THEORETICAL APPROACH TO ENVIRONMENTAL POLICY-MAKING

A wide range of factors have been identified by political scientists as determinants of environmental quality. These include institutional, economic, and social factors that in one way or the other drive human societies' interaction with their surrounding environment. Understanding the role of institutions in promoting environmental quality is of particular interest to this work, as institutional capacity and structure can play a fundamental role in shaping public and private actors' behavior toward improved environmental conditions. One specific institutional factor driving environmental governance is the *structure* and *quality* of property rights. In combination with social norms, technology, and resource conditions, *property rights* can greatly determine collective outcomes in social settings (Young, 1994). Thus, the definition and enforcement of property rights provide a foundation for environ-

mental and economic activity, particularly relevant in an increasingly complex world where interactions among multiple actors take place across space and time.

Understanding how different arrangements of property rights can affect environmental quality and governance has been the goal of an extensive array of literature. One important contribution to this debate has been given by the *collective action theory* (Taylor, 1987). According to this theory, rational and independent individuals tend to base their withdrawal and investment decisions on expectations of return (cost-benefit analysis). Thus, when cooperation is required for the provision of some socially desirable good, such as environmental quality, individuals' strategies to maximize their utility prevent them from contributing to the common goal. *Collective action problems* particularly arise from situations in which individual' property rights are not well-defined and enforced, as in the case of *common property* and *open-access* resources.<sup>23</sup> To put this into perspective, we can use the example of common fresh-water users who need to invest in water treatment facilities but have low incentives to do so because they know rival appropriators will capture part of the return on their investments (Fuchs, 2003). In this sense, *collective action problems* are essentially characterized by divergences between social and private costs and benefits, in other words, externalities.

Because a complete or partial lack of property rights is frequent in the context of environmental resources, environmental externalities abound, reaching from local problems, such as the pollution and destruction of fresh water resources and soils, to global problems, such as climate change and biodiversity loss. In the absence of secure property rights over *open-access* natural resources, individuals cannot prevent their overuse by others. Thus, the only

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<sup>23</sup>Given their low level of excludability and the high potential to free-ride for non-contributors.

way to optimize their private benefits is through increasing their own withdrawal rates above the social optimum, as gains are distributed on a first-come, first-serve basis (Fuchs, 2003). This has resulted in over harvested fishing grounds, depleted hunting grounds, destroyed forests, and severely polluted air and water resources. Environmental externalities can also arise from a situation where land is held as private property but its use directly or indirectly interferes in *common-property* or *open-access* natural resources. This occurs, for example, when specific types of land-uses and practices give rise to overexploitation and depletion of important ecosystems services, for which property rights are not defined or enforced. This is the case, for example, of trans-boundary resources such as air and waterways.

Hardin's (1968) theory of the *tragedy of the commons* was the first to draw attention to this dynamic, suggesting that the definition and enforcement of property rights determine one's attitude toward environmental resources. He argues that in the absence of well-defined and well-enforced property rights individuals are likely to act according to their self-interest and contrary to the best interests of the whole group by over-exploiting and depleting some common natural resources (Fuchs, 2003). This occurs because the environmental costs of an individual's action are not only borne by that individual, the same way as the environmental benefits from an individual's action do not all accrue to that individual. These factors may influence an individual's willingness to preserve or over-explore such resource (Fuchs, 2003). Though the original economic argument underlying Hardin's tragedy of the commons is not without weaknesses. One of the major problems is in the fact that it ignores other variables that also may lead to *collective action outcomes*. Particularly, it overlooks the role of legal provisions and social norms in limiting individuals' behavior toward the environment. This

notion will inform future discussions on the role of law and policies in shaping agricultural *multifunctionality* in the EU.

Another general assumption underlying market driven environmental-economics studies is the one that suggests that economic growth is a good determinant for environmental quality. This relationship has been conventionally represented by an inverted U-shape curve (environmental Kuznets curve), and has been given credence by some findings which suggest that, for a number of pollutants, there appears to be an empirical relationship between income per capita and environmental quality. This means that as income per capita increases, environmental quality deteriorates up to a point beyond which environmental quality improves (World Bank, 1992). Driven by this line of thought, policy reforms designed to promote trade liberalization have been encouraged with little regard to their environmental consequences, presumably under the assumption that these consequences would either take care of themselves or could be dealt with separately.

Refuting this thesis, Dasgupta (1996) makes the case that economic liberalization and other policies that promote growth in gross national product are not substitutes for environmental policy. On the contrary, it may well be desirable that economic development policies are accompanied by policy reforms to address market failure in mitigating environmental externalities. Fuchs (2003) also provides some empirical evidence that, independent of economic growth, improvements in institutional capacity can have a positive impact on environmental quality, thus suggesting that governments in both poor and rich nations can equally improve environmental conditions via straightening institutional capacities.<sup>24</sup> Corroborating

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<sup>24</sup>For example, by restricting private rights to reduce environmental externalities.

this argument is a recent study by Rodrigues et al.(2014) which finds that wealthier nations protect biodiversity no better than poor nations, thus suggesting that economic development does not guarantee success in conservation policies. According to this study, countries like Australia and the United States - two of the richest nations - were found to be among the worst performers in achieving good status of biodiversity conservation, while poorer nations including Madagascar and Tanzania are among the best.

Furthermore, when looking for other potential drivers of environmental quality, Dasgupta et al.(1995) find *freedom of property* to have a significant impact on individual decisions affecting environmental conditions. The authors suggest that the connections between environmental protection and civil and political liberties are a close one, and they are key to realize collective goals. Thus, the solution to current environmental crises should involve efforts to reform institutional settings to galvanize private users of resources to account for the social costs of their actions (Dasgupta, 1996). For Dasgupta, more than economic growth, what matters for environmental quality is the content of economic growth, which is determined by, among other things, the institutional framework within which human activities are conducted. In this sense, better institutions not only promote greater efficiency in the allocation of environmental resources at all income levels, but also assure a sustainable scale of economic activity within the ecological life-support system. This line of thought may explain, for instance, why voluntary approaches taken by free-market oriented policies have failed to solve major environmental problems, as these policies often give self-interested individuals the freedom to pursue their personal gains without concern for social costs (Fuchs, 2003).

With this theoretical framework in mind, we can now turn into the EU to explore how environmental regulation has been structured there, and the extent to which current institutional settings have been used to address major environmental problems in agriculture. Environmental policy decisions are particularly restricted by constitutional frameworks, which allow for different degrees of policy intervention and may require different actions by governments (Hall, 1993). Another challenge governments may face in environmental governance is in terms of reforming institutions and designing policies that are appropriate for the objectives to be achieved. This requires understanding complex ecosystem dynamics underpinning environmental systems that are so heavily influenced by equally complex property rights regimes. While science only scratched the surface in terms of exploring these dynamics and testing ecosystems' resistance to anthropogenic interference - making environmental policy more challenging - one way some governments, including the EU, and some private actors have dealt with these uncertainties is through applying a *precautionary* approach to environmental decision-making.

## 4.2 ENVIRONMENTAL REGULATION IN THE EU

In the European Union, environmental regulation is structured under a very unique institutional framework, which differs from traditional constitutional systems.<sup>25</sup> In this system,

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<sup>25</sup>While in sovereign nation-states the division of legal prerogatives between federal and state powers and the deliberation of values are set under normative-frameworks based on classical constitutions, in the European Union the governance system is created by law, by treaties. The EU treaties set the division of legal competences between EU institutions (supranational and intergovernmental) and Member States, and the deliberation of values in the EU's legal order. In this system, EU institutions and Member States act by legal measures and all of their actions, legislative or executive, are subject to judicial review on legal grounds in national courts and Community courts for ensuring compatibility with the treaties and with other basic overriding legal principles. For more detail on the EU constitutional framework *see* Laffan (2001).

EU institutions and Member States share responsibilities over the protection of the environment. The division of power between the Union and sovereign Member States is guided by the principles of *legality*,<sup>26</sup> *subsidiarity*<sup>27</sup> and *proportionality*.<sup>28</sup> In a nutshell, the aim of these principles is to restrain the use of powers in EU policy-making.<sup>29</sup>

Among the arguments supporting the EU as the appropriate level of environmental regulation include: (i) the inability of Member States to solve trans-boundary environmental issues, such as biodiversity, air and water pollution; (ii) the fact that subsidiarity does not preclude EU lawmakers from regulating issues that do not have cross-frontier elements; (iii) the claim that legal harmonization ensures a common approach is applied to all Member States; and (iv) the fear that maintaining unilateral measures may exacerbate the distortion of competition and create new barriers to free trade among Member States operating in the EU Single Market (Sadeleer, 2012).

It was not until 1972 that an environmental agenda emerged from separate initiatives in EU policy-making. To be more precise, it was only in the Single European Act of 1986 that the greening of European politics was first recognized (Staab, 2011). Then in 1992,

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<sup>26</sup>Also known as the principle of *conferral*, the principle of *legality* is recognized under Article 5(1) of the TFEU, which provides that ‘the Union shall act only within the limits of the competences conferred upon it by the Member States in the Treaties to attain the objectives set out therein. Competences not conferred upon the Union in the Treaties remain with the Member State’.

<sup>27</sup>The principle of *subsidiarity* is recognized in Article 5(3) of the TFEU, which provides that ‘in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at a central level or at regional and local levels, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level.’

<sup>28</sup>The principle of *proportionality* is recognized in Article 5(4) of the TFEU, stating that ‘the content and form of Union action shall not exceed what is necessary to achieve the objectives of the Treaties’.

<sup>29</sup>Two requirements must be satisfied to ensure that the EU is the most appropriate decision-maker to regulate environmental issues: (i) first, EU lawmakers have to demonstrate that the objectives of the proposed action cannot be sufficiently achieved by the Member States either at central level or at regional and local level; (ii) second, they should also demonstrate that the proposed action by reason of its scale or its effects can be better achieved at the Union level (Sadeleer, 2012; and Lenaerts, 1993).

more formal inclusion arrived with the Maastricht Treaty, which officially linked the promotion of sustainable growth to environmental protection. Since then, EU institutions have increasingly taken over Member States' authority to regulate environmental matters and to control public and private activities affecting the environment across the whole EU. These include standards addressing water quality and quantity, pesticides use, carbon emissions, biodiversity and habitat protection, while other standards addressing soils have been left out of *cross-compliance*.

Today, the large majority of environmental standards derive from EU-level regulation, which has steadily replaced national legislation. Although the Treaty on the Functioning of the European Union (TFEU) does not specify the normative instruments to be used by the Union, Directives<sup>30</sup> have been the most common instrument of Community legislation in the area of environment, perhaps because they can be more easily adapted to national realities, making them more politically appealing to Member States (Grossman, 1994).

Where the subject matter has been harmonized under Community law, Member States must implement them and may not pursue environmental policies that conflict with EU law. The timely and correct implementation of community law is a crucial step in the environmental regulatory process. However, it should be mentioned that Member States still retain much leeway in framing community laws to adapt to national and local realities. Member States are also vested with a residual regulatory competence, which they can exercise in order to maintain or introduce more stringent environmental protection requirements. As one can

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<sup>30</sup>A Directive is a legislative act of the European Union, adopted by the European Parliament and the Council, in relation to several environmental issues, and requires Member States to achieve a particular result, but without dictating how they are to do so.

imagine, the Directive approach has led to a high degree of variation on how community law is translated into practice across Member States. In the end, Member States are the ones responsible for establishing control and oversight regimes that apply the policing measures associated with environmental protection and to sanction violations. For example, decisions over granting an environmental permit for a plant to operate, conducting an environmental impact assessment (EIA), and regulating waste are a matter for national, regional and even for local authorities, not for the European Commission (EC).<sup>31</sup>

Although the Commission is recognized as the main driver behind the EU's environmental agenda, both in terms of administering policies and regulations and in prioritizing key areas for activity, it has limited power to oversee implementation at the Member State level. Because the EU Commission lacks the constitutional prerogative federal governments possess, it can do little to ensure that community regulation is effectively enforced at the national level. Instead, it has to rely on non-prescriptive efforts to convince Member States of the importance of agreeing and implementing coordinated environmental policies (Staab, 2011). This scenario becomes even more complicated given that Member States have very different positions and cultural attitudes toward the environment. Therefore, translating environmental regulation from paper to practice has not been an easy task for the EU. These challenges will be further elaborated in the context of CAP environmental measures in Chapter 5, when an analysis of implementation at the Member State level using the UK

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<sup>31</sup>The EU Commission is responsible for ensuring that treaty provisions and Community law are implemented correctly at the Member State level. It can also initiate infringement proceedings against Member States and, when necessary, bring claims to the European Court of Justice. The Commission is also vested with the power to propose new legislation to be voted in co-decision by the Council and the EU Parliament, and is an influential institution in the process of adopting EU law. In addition, the Commission issues rules to implement some treaty provisions. For more information on the EU Commission *see* Staab (2011).

as a case-study is made.

Implementation at the Member State level has been also driven by litigation and the increasing ruling power of the Court of Justice of the European Union (CJEU).<sup>32</sup> The CJEU has played an important role in establishing the legal foundation and promoting harmonization of community environmental policy. One of the most emblematic cases is the *Commission v. Denmark* (1988), where the CJEU ruled that environmental protection may override the free movement of goods, meaning Member States would still have the authority to regulate specific market conditions if necessary to protect the environment.<sup>33</sup> It is important to highlight, however, that the CJEU plays a secondary role in the EU judiciary system, as its power is limited to what is necessary to guarantee the effectiveness and uniform application of community law across Member States. The mainstream judicial enforcement of community law against Member State authorities continues to take place in the national courts. Thus, in this system, the authority of national courts and the initiative of private parties play a key role to the functioning of the EU environmental protection system.

Other important drivers of EU environmental regulation are the formally recognized union guiding principles. They are the *precautionary-principle* and the *polluter-pays-principle*, both endorsed by the EU through treaties.<sup>34</sup> While the *precautionary-principle* has served

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<sup>32</sup>The CJEU consists of 28 independent judges assisted by 9 advocates general who present reasoned opinion to the court. The court has jurisdiction to interpret the EU treaties, and to interpret EU law to ensure they are applied in the same way in all Member States, and settles legal disputes between national governments and EU institutions. It can also, in certain circumstances, be used by individuals, companies or organizations to take action against an EU institution, if they feel it has somehow infringed their rights. CJEU's decisions are binding in their entirety, even though only as to those Member States and private parties to whom they were addressed (Grossman, 1994).

<sup>33</sup> The court's ruling stated that a Member State's national provision containing specific marketing conditions for a specific good or service is legitimate when it is necessary to satisfy the mandatory requirement of environmental protection (Case 302/86, [1988] E.C.R. 4607, 4630, 1 9, [1989] 1 C.M.L.R. 619, 631).

<sup>34</sup>Article 191(2) of the Treaty on the Functioning of the European Union. available at <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12012E/TXT&from=en>.

as a legal justification to sustain, for example, the EU's ban on genetically modified crops and inform several other aspects of EU environmental legislation under conditions of uncertainty, the *polluter-pays-principle* has served as the legal bases for holding financially liable any operator whose activity violates environmental laws and causes environmental damage or imminent threat of such damage.

The extent to which these principles have been integrated into EU agricultural policies and influence farmers' adoption and implementation of best management practices, however, has been limited. Although mechanisms to enforce the *polluter-pays-principle* may exist in some Member States (e.g. fines), the diffuse nature of pollution from agriculture and the difficulty in identifying the polluter has hampered enforcement and accountability for damages. Further undermining the potential to apply this principle in agriculture is the fact that farmers' environmental violations are not usually linked to CAP supporting schemes, and therefore do not affect their eligibility to receive payments (Grossman, 2006).

One principle that has been used often to justify CAP supporting schemes is the *provider-gets-principle*. Under this principle farmers are expected to be compensated for providing the public goods and services that are valued by society (multifunctionality). In essence, the *provider-gets-principle* conflicts with the *polluter-pays-principle* in the sense that instead of distinguishing farmers' responsibility for making good use of the available natural resources (and holding them accountable for any violations), the *provider-gets-principle* in part recognizes that society is the one that should bear the costs of environmental compliance, and not farmers. Whether or not this should be the case deserves wider discussion in future CAP reform negotiations, taking into account the impacts of such changes on farmers' en-

environmental performance and outcomes, and making sure that programs consider farming economic viability and global market competitiveness.

The emergence of environmental groups as influential and powerful actors has largely contributed to the process of bringing environmental issues to agricultural policy debates. Environmental organizations have also played a key role in environmental regulation through the promotion of litigation. Particularly since the 1950s and 1960s, a broad spectrum of interests and a large number of political organizations started to turn to the courts to bring suit against government agencies, giving rise to global judicialization of political disputes. While the increased use of litigation by environmental advocacy groups has been widely witnessed, though little research has focused on exploring the factors driving these changes over time.

Drawing from *pluralist* and *corporatist-based* conceptions of environmental advocacy Morag-Levine (2003) ponders that rather than responding to changes in *standing* legal norms,<sup>35</sup> the judicialization of environmental politics has been associated to deeper processes of separation between civil society and the government. She also suggests that legal challenges to administrative decisions tend to be more frequent within *pluralist* systems (e.g. the US), than in *corporatist* systems like Europe. According to her, this might be explained by the fact that, in *pluralist* systems, there has been a considerable decline in partnership ideologies within and outside the groups, making them more prone to engage in

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<sup>35</sup>In law, *standing* or *locus standi* is the term for the ability of a party to demonstrate to the court sufficient connection to and harm from the law or action challenged to support that party's participation in the case. In other words, *standing* refers to the capacity of a party to bring suit before the court to obtain a judicial decision. In the US, recent changes the standing doctrine have opened more opportunities for environmental organizations to sue government agencies.

conflicts. In *corporatist* systems, on the other hand, there has been much more cooperation between government and environmental groups. Thus, even within groups unaffected by narrow standing rules, individuals are generally more reluctant to engage in conflicts with the government. This gives more support to the argument that, beyond the standing-based hypothesis, *corporatists* groups' behavior has been driven by their larger patterns of collaboration with government institutions (Zeigler, 1988). The extent to which these ideologies and patterns of collaboration amongst environmental groups, EU institutions and Member States have influenced negotiations and implementation of CAP environmental objectives is, however, beyond the scope of this work. Exploring these links and the politics behind CAP negotiations may contain lessons to inform future integration and implementation of environmental objectives. These are questions to be addressed in future research.

Against this background on how environmental policy-making has been theoretically and legally framed in the EU, the following chapters will investigate how and to what extent EU environmental regulation has been integrated into the Common Agricultural Policy (CAP) and how this has affected the allocation of agricultural subsidies to European farmers. Particularly driven by the *multifunctionality* paradigm, the EU CAP has been continuously reformed to integrate environmental performance requirements. However, environmental standards in agriculture continue to be generally implemented on a voluntary basis; farmers are not legally bound to most environmental requirements if they do not apply for subsidies. A detailed explanation of CAP environmental standards will be provided in chapter 5. Prior that, however, the following section will lay out a conceptual framework to the briefly introduced concept of *multifunctionality* as reviewed in the literature, and provide a theoretical

basis for subsequent discussion.

### 4.3 CONCEPTUAL FRAMEWORK OF MULTIFUNCTIONALITY

The concept of *multifunctionality* was first introduced in the context of the Rio Earth Summit in 1992 (UNCED, 1992), and since then has been increasingly cited in policy and scientific discussions on the future of agriculture and rural development. In the literature, approaches to *multifunctionality* can be divided into four main categories: *market-regulation*, *land-use*, *actor-oriented*, and *public regulation* approaches. Broadly speaking, *multifunctionality* refers to the ability of agriculture to produce, in addition to the marketable outputs (e.g. food, feed and fiber), public goods and services that are valued by society. These include, for instance, the management of renewable natural resources, the conservation of biodiversity, the design of landscapes, and the contribution to the socio-economic viability of the rural countryside.

At the policy level, discussions on *multifunctionality* have been largely driven by the *market-regulation* approach following the conceptual framework provided by the Organization for Economic Cooperation and Development (OECD, 2001). This notion emerged in response to concerns over the legitimacy of government supports to agriculture and the liberalization of global commodity markets. Drawing from a neoclassical-economic approach, the OECD framework identifies two key elements describing *multifunctionality*: (i) the joint production of multiple commodity and non-commodity outputs; and (ii) the fact that some of the non-commodity outputs exhibit the characteristics of externalities or public goods

for which market does not exist or functions poorly (OECD, 2001). *Multifunctionality* can encompass both positive (e.g. functional landscapes) and negative (e.g. water pollution and soil erosion) externalities; and it may also involve intangible goods, such as the spiritual and symbolic value of preserving the countryside and its cultural heritage (Bohman et al., 1999).

Because commodity and non-commodity outputs in agriculture are jointly produced, any policy that offers direct incentives or disincentives for the provision of the non-commodity outputs to ensure that these outputs are supplied at desired levels has implications for commodity production. In other words, any policy that limits or incentivizes the provision of environmental outcomes by farmers may interfere in their capacity to produce commodities. Thus, government intervention mechanisms affecting farmers decisions are directly linked to multilateral agreements on agricultural trade liberalization. This is precisely the reason why agricultural policies in OECD member countries have been so largely driven by decisions made in the World Trade Organization (WTO) negotiations.

By recognizing the inherent integration of commodity and non-commodity outputs in agriculture, WTO member countries have found a way to justify the continuation of domestic support within the scope of free trade agreements (OECD, 2001; and 2003). Under the final WTO agreement on agriculture, *non-trade-distorting* support (including direct income support) has been categorized as “Green Box” payments, exempting them from reduction commitments. This means that Members could still provide domestic support to farmers under ‘environmental and regional assistance programs.’ Green Box payments have to be generally available to producers within the region and cannot be ‘related to, or based on, the type or volume of production’ (otherwise known as *decoupling*). Furthermore, the size of

these payments must be defined based on farmers' income forgone as a result of the measures implemented. While this approach has the advantage of requiring less complex measurements (e.g. how much production has been lost due to the new scheme), the "Green Box" system does not include a guarantee that payments are being targeted at specific outputs, thereby having little capacity to drive changes toward sustainable aspirations.

As it can be seen, discussions on *multifunctionality* are closely tied to those on non-trade concerns (NTCs) as both are central to the domestic policy of WTO Members, and involve interests related to the protection of the environment, rural development, and food security (Grossman, 2003; and OECD, 2001). Both *multifunctionality* and NTCs seek to promote policies that are targeted, transparent, and cost-effective, and that maximize benefits, and avoid distorting production and trade (Grossman, 2003). Some believe that the term NTCs has 'metamorphosed' into *multifunctionality*, with some WTO Members using the term *multifunctionality* to describe a range of agricultural non-trade concerns (Cairns Group, 1999).

The *multifunctionality* debate is also inherently tied to that on *sustainability*, as both are linked to positive and negative externalities arising from agricultural practices. The main difference between them lays in the fact that while *multifunctionality* is interpreted as a *characteristic* of the production process, sustainability takes a *goal-oriented* approach (OECD, 2001). In other words, *multifunctionality* is used to describe the multiple, interconnected outputs or effects deriving from agriculture; while sustainability encompasses an idea of trajectory, which requires a comparative analysis against a baseline condition in order to determine whether one set of actions may be better than another, based on criteria set

by society following a political process (Endres et al., 2015).

Although *multifunctionality* is seen as a characteristic of the production process, it can also entail a ‘normative’ value, referring to the multiple roles assigned to agriculture. In this sense, agriculture as an activity is entrusted with the obligation of fulfilling certain functions in society. For example, agriculture is expected to produce abundant and affordable food, while at the same time taking into account the environment, maintaining rural landscapes, and protecting the welfare of animals and the health of consumers (Abramovay, 2002). Consequently, *multifunctionality* becomes not only a characteristic of the production process, but a value in itself. Therefore, maintaining a multifunctional activity or making an activity more multifunctional becomes a policy objective (OECD, 1998).

### ***Multifunctionality in EU policy***

The concept of *multifunctionality*, along with that of *sustainability*, was strongly supported by the European Community in the WTO round of negotiations on agriculture (O’Neil, 2002). This vision was also manifested in the Commissioner Fischler’s statement when he noted that the future model of agriculture must be based on the “multiplicity of functions performed by the agricultural sector” (Fischler, 2003). These would include the market function (served by more competitive prices), the environmental function (served by rewarding farmers’ efforts that benefit society), and the functions of rural areas (served by policy instruments to promote rural development) (Grossman, 2003). In order to put these aspirations into practice, new policy measures were to be introduced into the CAP, for example, to directly reward farmers for the work they do to improve the environment, animal welfare

and product quality (CEC, 2003). Within the scope of the Common Agricultural Policy (CAP), this vision has reflected in several reform processes, as will be discussed in chapter 5.

Policy drivers of *multifunctionality* were initially provided by countries' commitments to further progressive reductions in domestic agricultural support and trade barriers, shifting away from policy measures that encourage higher levels of food production and input use, toward measures that are less distorting of markets and trade. Currently, the contribution of the *multifunctionality* debate goes above and beyond the simple *decoupling* of payments away from production levels to farmers' income support. It has opened the path for discussions about the amount, distribution, and the very meaning of public support to agriculture, not only within the WTO negotiations, but mainly within the European Community (Abramovay, 2002). Among both rural and urban communities across the EU, there is growing public concern of the positive and negative effects of agriculture on the environment, an issue that now mobilizes a varied set of players that have come to question the purely agricultural production orientation of public expenditures in the EU.

Nevertheless, despite all the efforts to fulfill multifunctional aspirations through CAP subsidies, most European farmers continue to be entitled to payments without having to do much for the environment and the community. As they exist today, CAP income support systems do not fundamentally aim to pay for multiple-socially-valued functions, but instead work as a simple form of guaranteeing major European agricultural products a place in the world market. In this sense, *multifunctionality* has functioned as a simple language to justify protectionist measures enacted in the guise of environmental objectives (Abramovay, 2002).

Moreover, for the most part, it is not possible to establish a direct link between farmers' income support schemes and the positive public externalities their agricultural activities provide, and payment reductions applied to farmers who fail to comply with CAP standards have not been sufficiently persuasive.<sup>36</sup>

### ***Subsidies for multifunctionality***

Within the political process, *decoupling* of payments carries the danger of creating in the public a negative perception about the role of farmers and why it is important to support agriculture (Medina & Potter, 2015). These concerns have led governments to increasingly look for ways to ensure that payments compensate real outputs, and that these outputs correspond in quantity, composition and quality to those demanded by society.

This debate has given rise to output-oriented subsidies, which are based on measurements of the real benefits of practices implemented. Moving toward output-oriented payments, however, requires understanding and addressing site-specific considerations. This is because the linkages between agricultural commodity and non-commodity outputs are largely influenced by site-and-area-specific conditions. Among these factors are, for example, the availability of farm-level data, new technologies and tools, and farmers' experiences, which create new ways of using a farm's resources and influence the bundle of non-commodity outputs that can be generated in the process. Agricultural research and development, in combination with investments in farmers-knowledge, are potentially effective ways of modifying the linkages that determine the non-commodity outputs of agriculture (Cooper et al., 2009). Public-private partnerships can also make a substantial contribution to innovation and resource-use

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<sup>36</sup>Special Report No 5/2011 on the Single Payment Scheme.

efficiency in agriculture, with efforts supported by research institutes, industries, universities and government extension agencies. Governments may play also a key role in this process, by providing the institutional support needed to facilitate the design and implementation of outcome-based measures and payments.

Two aspects are of fundamental importance when designing outcome-based measures. First, exploring the spatial scale and time dimensions of *multifunctionality* is crucial to achieve improved results. The costs to individual farmers to maintain or improve the provision of public goods and services, and the quality of these services can differ substantially across farms and within and across regions. Thus, ignoring differences in site productivities and scale dimensions of non-commodity outputs can lead to local over- or under-provision of these outputs. It is equally important to identify the appropriate administrative level at which market or policy responses should be organized. Because ecosystems and watersheds do not neatly fit within individual owner's boundaries or even within state jurisdictional lines, working across farms fences and state boundaries is needed if practices are to contribute to ecosystem level functions and services (see Harden et al., 2013 for a discussion on patchwork and interwoven multifunctionality).<sup>37</sup> Second, questions concerning the length of time it takes for a non-commodity output to be produced, the pattern of development it follows during that period, the speed at which farming practices and systems can be adjusted, and

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<sup>37</sup>Lessons learned in sustainability standards show the importance of translating individual practices into landscape level improvements. In biofuels, standards systems have tried to develop "consumer" level standards that can provide a more meaningful measurement of environmental achievement, and allow for varying levels of performance by individual producers in relation to identified ecosystem, watershed, and other shed-level goals (Endres et al., 2015). Challenges remain, however, in gathering field and even sub-field level data and accompanying verification costs, addressing complexity of analysis, and defining the system or "shed" boundaries. For instance, seeking to improve spatial targeting and reflecting the complex nature of implementing landscape scale schemes targeting multiple ecosystem services, European agri-environment schemes have mostly focused on site-specific single objective measures.

whether a non-food concern is permanent or temporary need to be taken into consideration in the design of policy measures targeting *multifunctionality* (OECD, 2001). Also, in order to deliver the best of the environmental results, outcome-based payments need to shift from top-down driven contractual agreements with individual farmers to how to integrate local governance into payment design and delivery, and how to best support self-governance of groups of related land managers (Schwarz et al., 2008).

One issue that may arise from a broader adoption of output-based payments is their associated increased risk, as factors outside of farmers' control (e.g. climatic conditions) can largely affect non-commodity outcomes. In a purely outcome-based scheme, if a farmer fails to achieve the required outcomes, he/she will not qualify for payments. Because CAP payments form a significant proportion of total farm income for many EU farmers, the risk of losing access to these payments may negatively influence farmers' acceptability toward output-based schemes (Schwarz & Morkevenas, 2012). One way to reduce risk would be by introducing a flat-rate component into payments in addition to the result-oriented component.

Expanding the use of outcome-based payments may offer the opportunity to change historical distribution patterns of CAP subsidies, potentially diverting more money to the most environmentally sustainable farmers who provides the most of the public goods (Cooper et al., 2009). Before this occurs, questions remain about the extent to which the high level of domestic support provided to European farmers over the past decades has truly helped to foster the non-commodity outputs of agriculture, particularly in its environmental component. Environmental objectives can be integrated into farming activities through many

technical ways. Achieving these objectives requires not only navigating through complex and integrative analysis to find the most suitable measures to achieve the targeted outcomes, but also providing the institutional framework to facilitate the design and implementation of environmental, socially and economically sound policies. The greatest challenge for the research community and policy-makers has been to develop resilient agricultural systems using rational and affordable strategies such that ecosystem functions and services can be maintained and improved, and livelihoods can be protected.

In order to explore these questions, the next section will look into the institutional framework within which CAP subsidies have been provided to farmers and how they have been used to achieve environmental and rural development objectives that translate into *multi-functionality*.

## Chapter 5

# POLICY EFFORTS TO GREEN THE EU COMMON AGRICULTURAL POLICY

*“As long as there are no mechanisms that reward farmers for the external benefits and hold them accountable for the external costs of their activities, there is no guarantee that agricultural support policies affect non-commodity outputs in the desired direction.” (OECD, 2001)*

### 5.1 PAST EXPERIENCES

Over the years, improvements in the environmental management of Europe’s farmland have been achieved both as a result of environmental regulation and integration of environmental standards into the Common Agricultural Policy (CAP). EU environmental regulation has played an important role in controlling the more harmful farm practices (e.g. the use of chemical inputs under the Sustainable Use of Pesticides Directive), as well as designating priority areas and habitats for conservation, where farming practices have been restricted in

return for compensation (e.g. habitat payments). The scope of these regulations, however, is limited both because they do not cover all the environmental pressures (e.g. there is no EU-level regulation on soils) or the existing regulation has not been fully integrated into agriculture.

Since 1985, there has been a gradual acceptance that besides environmental regulation, other sectorial policies, particularly the CAP, would need to address environmental issues. Article 11 of the TFEU has specifically recognized that ‘environmental protection requirements must be integrated into the definition and implementation of the Union policies and activities, in particular with a view to promoting sustainable development.’ Because agriculture uses nearly half of EU territory, it becomes a central piece in any policy strategy to address environmental problems. Also, as the largest source of funding currently available to influence the management of rural land, the CAP can play a key role in leading farmers toward more environmentally sustainable farming systems. In order to realize this potential, over the past decades, environmental standards have been gradually integrated into the CAP as preconditions for farmers to access subsidies. Understanding the evolution of the CAP greening process, connecting it to wider EU environmental policy, and exploring how this process has developed over time is an important step for those seeking to learn how the current CAP regulatory framework operates to address environmental issues in agriculture.

### *The early days of the CAP*

Elaborated by the Rome Treaty in 1957, and implemented in 1962, the CAP was initially driven by the need to ensure European independence and food security (Zobbe, 2002). In

its early stages, CAP measures followed previous national policies and were mainly focused on supporting farmers' income and promoting greater efficiency in agricultural production (Wilson & Wilson, 2001). Although the CAP has been successful in achieving its market-oriented goals, for many decades it completely neglected the negative externalities of agricultural intensification, leading to overexploitation of the available natural resources and severe environmental problems.

Over the past two decades, following discussions on *multifunctionality*, the protection of the environment and the delivery of public goods by agriculture have become permanent issues raised in policy debates, influencing changes in many aspects of EU agricultural policy and regulation. Among the major demands for policy revisions were: (i) decoupling of agricultural subsidies from production levels, (ii) tying payments to targeted environmental objectives, and (iii) transferring funding from direct payments (Pillar 1) to the rural development agenda (Pillar 2).

Responding to these demands, the CAP has undergone several important changes implemented over five major environmental reforms: (i) the 1992 MacSharry reform; (ii) the Agenda 2000; (iii) the 2003 Mid-term reform; (iv) the 2008 Health Check; and (v) the Post-2013 reform. While negotiations on the MacSharry reform were mainly driven by the need to accommodate commitments made in the WTO Agreement on Agriculture and address budget constraints; later reforms also were much more influenced by changes in policy paradigms that shifted the CAP emphasis more toward the provision of public goods (*multifunctionality*), particularly environmental and social benefits.

### *The 1992 MacSharry Reform*

Named after the Irish Agricultural Commissioner Ray MacSharry, the 1992 reform package was the first introduction of an environmental dimension to the CAP. While preparing for the completion of the Uruguay Round<sup>38</sup> negotiations, and trying to address environmental concerns in the farming and forestry sectors, the EU was under increasing pressure to ensure that CAP payments were truly targeted at compensating the non-commodity outputs of agriculture and promoting sustainable practices. Although improving environmental protection was one of the purposes of the reform, it was enacted separately from the CAP commodity policy (Pillar 1 direct payments), appearing only as an accompanying measure. Driven by WTO agreements, the reform's main objective was to break the link between production and subsidies in order to balance out the CAP budget, reduce production surpluses, and control further environmental damages (Grossman, 1994).

In the EU, the MacSharry proposal coincided with the single currency project and the development of a Single Market, whose aspirations for free movement of goods, services, capital and labor were incompatible with trade distortion mechanisms implemented under the CAP (Staab, 2011). There was a lot of pressure within and outside the EU to move subsidies away from price support and replace them with non-production related measures (income support). Instead of receiving a market price support, farmers started to receive direct coupled payments.<sup>39</sup>

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<sup>38</sup>WTO Negotiations on Agriculture.

<sup>39</sup>Prior to the MacSharry reform, the CAP payments served to support prices, not the product or the producer. Following a reduction on price support schemes, coupled direct payments were introduced in order to prevent a corresponding fall in the incomes of farmers. Under this new scheme, the profitability of producing a product did not depend only on the price at which the farmer could sell the product in the market, but also on the amount of direct payment that was associated with that particular product. Coupled

Aside from granting coupled payments, the MacSharry reform also introduced “accompanying” measures, including the establishment of compulsory set-asides,<sup>40</sup> and a requirement for Member States to establish national agri-environment schemes (AES). This represents the first instance in which AESs become an integral part of CAP supporting schemes.<sup>41</sup>

Provided by Council Regulation 2078/92/EEC, the establishment of agri-environment programs became mandatory for all Member States, which were obligated to design multi-annual national or regional programs to encourage farmers to implement environmentally sound practices.<sup>42</sup> AESs constituted the first and positive step toward integrating environmental components into the CAP. Participating farmers are entitled to payments in exchange for the public benefits of farming which are calculated on the basis of farmers’ income losses and implementation costs. (Grossman, 1994). Still today, these payments are co-financed by CAP funds<sup>43</sup> and Member States’ budgets.

Although these programs were made mandatory to all Member States following the MacSharry reform, individual producers’ participation remained voluntary. Also, at this stage, CAP direct aid schemes were still exempt from environmental standards, and were mostly

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payments and other measures regulating or supporting agricultural markets (e.g. tariffs, export subsidies, intervention purchasing and output quotas) were 100 percent financed by the EU primarily through the European Agricultural Guarantee Fund (EAGF).

<sup>40</sup>This was a requirement for arable farmers to set 10 percent of their land aside to go fallow for a certain period in order to minimize their production potential. These set-aside areas would only serve to control production, and had no ecological objective tied to them. Only recently have set-asides been introduced into the CAP to fulfill ecological objectives through the establishment of the Ecological Focus Areas under the new *greening measures*. These measures will be discussed in section 5.2.2.

<sup>41</sup>Before the MacSharry reform, agri-environment measures were voluntary to Member States. They were first introduced by Article 19 of Regulation (EEC) 797/85 which allowed Member States to make payments to farmers who followed practices compatible with the environment in sensitive areas. However, only two countries, Germany and the UK, had effectively implemented AESs in their territory (CEC, 1988).

<sup>42</sup>Member State agri-environment programs should be submitted to the EU Commission for approval, and implemented to meet EU and Member States environmental objectives.

<sup>43</sup>Community co-financing was up to 75 percent of the cost of programs in less-developed regions, and up to 50 percent in other regions (Regulation 2078/92, art.8); and the distribution of these funds across Member States was not equal.

focused on strategies to control surplus production, sustain farmers' income and respond to international trade commitments.

### ***The Agenda 2000 Reform***

Agenda 2000 was the EU's second attempt to make the CAP greener. Also understood as a "deepening" of the MacSharry reform, Agenda 2000 did not create new policy instruments. Instead, it focused on adjusting existing schemes to address WTO commitments and environmental issues, such as further cuts in intervention prices and an increase in direct payments.

From 2000 onwards, the traditional mechanisms of price and income support were re-labeled as "Pillar 1" of the CAP (income support Pillar).<sup>44</sup> Another contribution of the Agenda 2000 was the establishment of the new program for rural development, which would comprise the CAP "Pillar 2" (Rural Development Pillar). The Rural Development Regulation (RDR) brought together a number of pre-existing CAP measures under one umbrella regulation. These include programs such as Agri-environment Schemes (AES) and Less Favored Areas (LFA, or 'natural handicap areas') currently supported under Pillar 2 funding. At that time, EU funding for rural development programs would come from the European Agricultural Guidance and Guarantee Fund (EAGGF), but would later become incorporated under the current European Agricultural Fund for Rural Development (EAFRD Regulation 1698/2005).

The restructuring of the CAP budget to create an independent Rural Development Pillar

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<sup>44</sup>Direct payments were primarily financed through the European Agricultural Guarantee Fund (EAGF), so were other measures regulating or supporting agricultural markets.

is often seen as the major contribution of Agenda 2000. But this did not actually lead to practical changes as no additional funds were made available under Pillar 2. In fact, the Agenda 2000's major environmental contribution was to give Member States the authority to make Pillar 1 payments conditional on farmers' *cross-compliance*. This would mean that, in order to access direct payments, claimants now had to comply with Statutory Management Requirements (SMR) and maintain their land in Good Agricultural and Environmental Condition (GAEC).<sup>45</sup> These standards will be discussed in detail in section 5.2.1.

Furthermore, Member States could now *modulate*<sup>46</sup> (reduce) direct payments in order to relocate CAP Pillar 1 transfers to Pillar 2 to support other programs, including agri-environment schemes (AES).<sup>47</sup> While *modulation* has been favored by environmental groups, who believe Pillar 2 subsidies can support more targeted environmental measures, it has been unpopular among farmers, to whom *modulation* is seen as taking away money from income support and putting it somewhere else<sup>48</sup> (Medina & Potter, 2015).

Another important aspect of the Agenda 2000 reform is the fact that it was established in the same year the EU Water Framework Directive (WFD) (Directive 2000/60/EU)<sup>49</sup> came into force. This new regulatory framework opened opportunities to integrate EU water quality and quantity standards to CAP *cross-compliance* requirements. Under the WFD,

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<sup>45</sup> Standards extracted from EU regulation in the fields of environment, food safety, animal health and welfare.

<sup>46</sup> *Modulation* refers to the shift of funds from direct aid (Pillar 1) to rural development policies (Pillar 2), by reducing transfers to larger farmers and relocating them to targeted rural development programs.

<sup>47</sup> Member States should spend at least 25 percent of their Pillar 2 transfers with AES.

<sup>48</sup> Because direct payments had been introduced to recoup losses from the lift of price premiums, reducing CAP direct payment transfer would result in reducing farmers' income.

<sup>49</sup> One of the integral parts of the Water Framework Directive is the Nitrates Directive, which has been in place since 1991 with the objective of reducing water pollution caused or induced by nitrates from agricultural non-point sources.

Member States would be now required to maintain and restore the quality of both their aquatic and adjacent terrestrial ecosystems, and to establish protection and enhancement of these ecosystems relative to their water requirements. Achieving good ecological status of water bodies necessarily requires Member States to reduce agriculture's pressure on water quality and quantity.<sup>50</sup>

### ***The 2003 Mid-term Reform***

A mid-term review of Agenda 2000 was proposed by the Commission in 2002, and approved by the Council in 2003. This reform represented another step toward aligning EU agricultural policy with growing public demand for healthy and better quality food, and environmentally-sound production methods that respect animal welfare principles (Fischler, 2003). The major contribution here was the decoupling of direct payments paid through the Single Payment Scheme (SPS) or the Single Area Payment Scheme (SAPS) under Pillar 1.<sup>51</sup>

Under the new SPS, direct payments would no longer be calculated based on certain production activities and levels. Instead of production premiums, farmers would receive annual income support payments, which would be calculated based on the volume of direct payments they received during a reference period. This meant that farmers would no longer need to plant certain crops or raise livestock in order to obtain financial support. Instead,

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<sup>50</sup>In the EU, agriculture accounts for 33 percent of total water use and is the main source of water nutrient pollution (ECA, 2014). Some 50-80 percent of the total nitrogen load of Europe's freshwater stems from agriculture non-point source pollution (EEA, 2011).

<sup>51</sup>In the EU-15, the Single Payment Scheme replaced most of the support previously provided under the main CAP regimes (arable crop area payments, livestock headage payments, olive production subsidy, etc.). For the EU-12 a specific direct payment scheme was introduced, the Single Area Payment Scheme (SAPS). In this system, payments are calculated on a flat-rate basis per hectare of farmland for each Member State, within a national budget ceiling. Supplementary payments may be made from national funds, and in some cases different rates are paid for arable land compared with permanent grassland. The SAPS systems were set to move to the SPS system by 2013 (EEA, 2009).

direct payments would be linked to a given acreage of land (known as *decoupling*). However, due to fears that the complete decoupling of payments could lead to the abandonment of production in some sectors, Member States had the option to maintain certain coupled payments alongside the Single Farm Payment (SFP). For instance, coupled payments could be implemented for arable crops, suckler cows, sheep and goats (Regulation 1782/2003).

With the *decoupling* of direct payments, CAP Pillar 1 subsidies were moved into the Green Box in WTO terminology and were no longer subject to reduction commitments. As a result, *multifunctionality* was discouraged. This concept, however, continued to be used in the arguments for the coupled payments maintained by Member States, particularly for farming in marginal areas to prevent land abandonment.<sup>52</sup>

*Cross-compliance*, which had been introduced as a voluntary option for Member States in the Agenda 2000, became mandatory with the 2003 Mid-term reform. This meant that, from 2005 onwards, farmers would have to comply with 19 SMRs - five of which related to the environment - and a number of GAEC standards. However, producers were not required to formally verify their compliance. Also, the reform maintained compulsory set-asides (e.g.

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<sup>52</sup>There has been abandonment of production associated with decoupling in Less Favored Areas (LFA). For instance, Scotland, which has 85 percent of its land categorized as LFA (only 6 percent of Scotland's land area is classified as 'above average quality land') and whose production alternatives are limited to ruminant livestock production fed under an extensive grazing system, has experienced a strong decline in the number of beneficiaries after the introduction of Single Payment Scheme. Part of the abandonment has been explained by the Scottish authorities as due to older or less efficient farmers getting out of farming and subleasing their land. The fact that there is an accelerated decrease in animal numbers maintained after the introduction of SPS is a cause of environmental concern, especially in the more disadvantaged 'hills and islands' areas or the fragile north-west region of Scotland. According to Scottish authorities, between 2005 and 2009, a 14.4 percent decline was observed in sheep numbers, and a 7.5 percent decline in cattle numbers. Portugal has also faced similar problems, since it has a high proportion of its agricultural land located in disadvantaged areas. The majority of sheep farming in Portugal occurs in areas with natural problems or in marginal areas with no economically viable alternatives. In 2009, 53 percent of total ewe premiums were paid to beneficiaries in the Alentejo region which is classified as LFA. After 50 percent of the ewe and goat premiums were decoupled, there has been a sharper decline in sheep and goat beneficiaries in this region. These examples show how decoupling has been associated to a higher risk of abandonment of production in disadvantageous regions due to limited alternatives.

fallow land), but were still intended to only serve as a supply control measure.

### ***The 2008 Health-check Reform***

In 2008 the EU Commission proposed the CAP Health Check package that contained ambitious strategies to address evolving challenges faced by agriculture, including rising global market prices, shifts in policy paradigms, and the need to move European agriculture onto a more competitive footing in the international market (Daugbjerg & Swinbank, 2011).

Among the major changes were: (i) abolishment of arable set-asides,<sup>53</sup> and (ii) the establishment of new deadlines to fully decoupling direct payments for the main arable crops, some specialized crops, and most livestock payments. Member States would still be able to maintain coupled payments for some sectors, including suckler cows, sheep and goats, and also for some smaller sectors (e.g. tobacco). (Daugbjerg & Swinbank, 2011).

Following the implementation of the Health Check reform, guaranteed support prices began to operate as safety net schemes, and support to farming took the form of largely decoupled payments through Pillar 1, and more targeted interventions through Pillar 2. As a result, today, the clear majority of direct payments are decoupled from production, and the remaining market intervention mechanisms have been gradually phased-out (EEA, 2009).

The level of *modulation* agreed was rather less than the Commission had initially proposed, and only farm businesses that were receiving SPS payments over €300k per year would be taxed on those payments more heavily. The extra funds generated by *modulation* would

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<sup>53</sup>The arable set-asides were an instrument that was very popular amongst farmers (because it helped maintain market prices high), but problematic to environmental groups, who claimed land set-aside could be best used to serve ecological functions, and that artificial mechanisms to control supply would eventually shift production elsewhere, particularly to developing countries, where land is largely available and governance structures to mitigate environmental and social tensions are usually weak.

in part be used to fund rural development projects within the four priority areas: climate change, green energy,<sup>54</sup> water management and biodiversity (Daugbjerg & Swinbank, 2011). Furthermore, Member States would now be allowed to transfer up to 10 percent of their direct payment national ceilings to fund particular commodity sectors (options permitted under Article 68 provisions). These funds could be targeted at protecting the environment, improve the quality and marketing of products, or for animal welfare support. They could also support payments for disadvantages faced by specific sectors<sup>55</sup> in economically vulnerable or environmentally sensitive areas.

Article 68 schemes to protect the environment were to be designed in the same way as agri-environment schemes under Pillar 2,<sup>56</sup> meaning they should be built using *cross-compliance* requirements as a baseline, and could only cover implementation costs and forgone income. By extending Article 68 options to include the protection of the environment, the Health Check blurred the lines dividing Pillar 1 and Pillar 2 measures, making it now possible to have 100 percent EU financing for multi-annual environmental measures undertaken voluntarily by farmers (Matthews, 2013a).

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<sup>54</sup>This proposal coincided with the EU ambitious targets to reach a 20 percent share of renewable energy consumption by 2020 (EU Renewable Energy Directive).

<sup>55</sup>Dairy, beef, sheep, and goats, and rice sectors.

<sup>56</sup>Some Member States have started to make use of this provision. Denmark, for instance, has used CAP Pillar 1 transfer to fund schemes supporting permanent grassland under low-intensity use. Ireland, on the other hand, has used funds to support schemes targeting local high nature value farming, while France has transferred its grassland support scheme from Pillar 2 to fund it under Article 68 of Pillar 1. For more details see Matthews (2013a).

## *The CAP-post 2013 Reform*

Discussions on *multifunctionality* were reopened in 2011 with the Commission's proposal for a new CAP reform, the *CAP-post 2013*.<sup>57</sup> Instead of proposing a further rebalancing of CAP expenditure between the two Pillars to support more environment- and climate-friendly AESs, the Commission's strategy put forward an ambitious and promising proposal to tie a proportion of Pillar 1 direct payments to a set of new mandatory *greening measures*. These would include: (i) crop-diversification, (ii) maintaining permanent grassland, and (iii) Ecological Focus Areas. Besides greening, the proposal also included changes to some GAEC standards, a revamping of Pillar 2 AESs, and a more prominent role for Farm Advisory Services (FAS) in facilitating innovation to deliver climate change and environmental objectives.<sup>58</sup>

Discussions were driven by the need to address some of the pressing environmental challenges arising from unsustainable farming systems across the EU, and to justify the continuation of a large budget for agricultural policy in the parallel negotiations on the future of the EU's long-term budget (Matthews, 2013b). What distinguished the *CAP-post 2013* negotiations was that, for the first time, in the history of the CAP the European Parliament played a key role in shaping the final agreement.<sup>59</sup> This meant that negotiations were much

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<sup>57</sup>The Commission Communication on the CAP toward 2020 was the initial document published on the *CAP post-2013* reform, which consisted of a synthesis of public debates and first propositions from the EU Commission for a new CAP framework. This document is carefully produced because it stresses the main ideas that the EU Commission wants the public to remember. It is the most complete document to represent the general philosophy shaping the CAP reform. For more details see CEC (2010).

<sup>58</sup>Member States are legally obliged to set up national FASs offering advice to farmers. The advisory activity must cover at least the SMRs and GAECs referred to in Articles 4 to 6 of Council Regulation (EC) No 73/2009. Member States may decide to include other issues within the scope of their FAS as well. Generally, FASs are coordinated and supervised by public bodies. The advisory bodies are selected via calls for tenders and by designating private or public bodies to assist farmers.

<sup>59</sup>Lisbon Treaty, which entered into force in 2009, improved the standing of the European Parliament

more influenced by national interests and outside pressure than ever before. Add to this the economic instability wrought by the 2008 financial crises and accompanying increased demand for cuts in public expenditures, and public discontent with the democratic deficit problem.

The *CAP-post 2013* proposal gave rise to a lively and contentious debate around the future of the CAP. After almost two years, negotiations were brought to a close in June 2013 when a political agreement was reached between the Commission, the European Parliament, and the Council. The outcome was much less ambitious than what had been proposed, which even then had been criticized by environmental groups, to whom the proposed measures were not an adequate response to the current environmental challenges facing European agriculture (BirdLife and others, 2011). Among the major changes were: (i) the establishment of the new Pillar 1 *greening measures*; (ii) changes and renumbering of some SMR and GAEC standards; (iii) replacement of the Single Payment Scheme (SPS) with the Basic Payment Scheme (BPS);<sup>60</sup> (iv) the establishment of the Active Farmer Test;<sup>61</sup> and (v) a broadening

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in the co-decision process. The EP is now an equal partner to the Council of Ministers when approving legislation under the new so-called ordinary legislative procedure, giving it the right to both veto and amend legislation. The EP also has now the power to approve the EU budget in its entirety, including the CAP. This new provision has been an essential improvement of the democratic legitimacy of the EU.

<sup>60</sup>Since January 2015, all SPS entitlements have been transformed into BPS entitlements. Member States will dedicate up to 70 percent of their Direct Payments national envelope to the new Basic Payment Scheme (excluding any amounts committed for additional payments, e.g. Young Farmer top-ups, and other options such as Less Favored Area top-ups) and “coupled” payments. For the EU-12, the end-date for the simpler, flat-rate Single Area Payments Scheme (SAPS) system was extended until 2020. Eligibility for the Basic Payment Scheme is a precondition for farmers to receive other direct payments such as the green direct payment. The major difference between this and the old system is that the Basic Payment Scheme introduces the element of the Active Farmer Test. To claim BPS each year, applicants must be an ‘active farmer’. For more details on the new BPS scheme *see infra* note 40.

<sup>61</sup>The Active Farm Test will tell if a farmer does or does not qualify for Basic Payment Scheme (BPS). All farmers with at least 36 hectares of eligible land will be able to apply for the Basic Payment Scheme (BPS) as an active farmer. Also, farmers can qualify as an active farmer if they prove that their total agricultural receipts are at least 40 percent of their total receipts in the most recent financial year. As part of this test, the European Commission has required all Member States to classify their land which is ‘naturally kept in a state suitable for cultivation and grazing’ and then decide the agricultural activity that needs to be done

of the scope of AESs. All these changes will be addressed in more detail in the following section on CAP standards.

### ***Driving forces behind CAP negotiations***

Historically, the CAP reform process has been driven by competing forces and policy approaches. In one side of the debate, is the farming lobby that claims farmers' reliance on government protection and demands the continuation of CAP payments (state-assisted paradigm).<sup>62</sup> On the other corner of the discussion, are some Member States (such as the UK) that believe CAP should be completely phased-out to free European agriculture from trade distorting policies (competitive agriculture paradigm). Another influential lobby group is represented by environmental organizations, which want for CAP subsidies to be more effectively tied to the provision of public-goods (*multifunctionality* paradigm). The exercise of these competing forces throughout several reforms has resulted in a multi-layered policy built by an addictive process with specific mechanisms being placed on top of others, making the CAP a very complex policy and creating structural challenges for implementation.

Despite all these competing forces and skepticism driving CAP negotiations, and farmers' general reluctance to support further greening, the integration of environmental standards into both Pillars of the CAP has shown relative progress in reducing some of agriculture's pressure on the environment (EEA, 2010b). For instance, run-off of nitrogen and phospho-

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on it. Some have argued the Active Farmer Test represents a move back toward a productivist approach in the CAP, linking subsidies to an element of production, and going on the opposite direction of decouple payments. Others believe the Active Farmer Test is a way to ensure payments are not funding people who are not engaged in farming activities.

<sup>62</sup>This approach holds the argument that agriculture needs protection because, different from most economic sectors in modern societies, it is subject to unstable weather and market conditions, which are beyond the control of the individual farmer.

rous<sup>63</sup> into waterways as well as greenhouse gases emissions have been reduced (EEA, 2011). It should be noted, however, that these improvements coincide with a period of stagnation in agricultural output growth in the EU, suggesting that along with policy changes, agriculture's environmental performance has incentivized by economic downturns (Matthews, 2013b).

Environmental protection and the provision of public goods and services have not been the only policy drivers underpinning CAP negotiations. Still today, major CAP schemes continue to be deeply rooted in productivist approaches. There is evidence to suggest that the CAP has not only fallen short in promoting public goods through subsidies, but it has used *multifunctionality* as a convenient justification for maintaining government support to farmers intact (Abramovay, 1999). Some believe *multifunctionality* has been used simply as a language to give CAP payments some credibility, and has not been primarily explored to influence the way farmland is managed to achieve multiple goals (Potter, 1998).

Today, the market context for food production and consumption is changing, and projections for future global food demand and prices suggest there will be strong incentives to increase production in the coming decades (OECD/FAO, 2012). Adding further to the demand for agricultural resources is the increasing consumption of biofuels and renewable energy, which has put even more pressure on the competition for land within and outside the EU (HLPE, 2013; and Searchinger & Heimlich, 2015). With the agricultural sector likely to move again toward increasing production through improvements in productivity, CAP environmental objectives run the risk of being left on the sidelines if Member States and farmers

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<sup>63</sup>Phosphorus is contained in fertilizers and used in animal feed. It can cause water quality problems such as eutrophication

are given too much leeway to decide whether to make the environment a real priority for farming.

Several studies provide evidence that Europe is still far from reaching a sustainable position on the state of its environment (as extensively reviewed in Chapter 3). The continuing environmental issues facing rural areas, the increasing pressures and uncertainties imposed by climate change, concerns about food, energy and water security, and economic crises combined require a fundamental review of the CAP framework, and a refocus of the policy to ensure that public funding is truly used to consistently promote public goods and services.

## 5.2 CAP ENVIRONMENTAL STANDARDS

Currently, the integration of environmental objectives into the Common Agricultural Policy (CAP) relies on three major instruments. These are: (i) *cross-compliance* and (ii) *greening measures* both applied to Pillar 1 direct payments, and (iii) the European Agricultural Fund for Rural Development (EAFRD) which provides for financial incentives for environmental actions through *Agri-environment Schemes (AES)*. While *cross-compliance* and *greening* are standardized measures implemented across the whole EU with little room for local adjustments, rural development and their AESs vary considerably across Member States, as they are adjusted to address local priorities and conditions.

### 5.2.1 Cross-compliance (Pillar 1)

Introduced in 2003, *cross-compliance* is a mechanism that ties direct payments to compliance with a series of standards and with maintaining agricultural land in good agricultural

and environmental condition.<sup>64</sup> These standards are currently set out in 13 Statutory Management Requirements (SMRs), and in 8 compulsory and 7 optional standards of Good Agricultural and Environmental Conditions (GAECs) relating to soil erosion, soil organic matter, soil structure, minimum level of maintenance of the land, and water management and protection. While SMRs are mandatory standards extracted from pre-existing EU Directives and Regulation (e.g. Nitrates Directive), GAEC are voluntary standards defined and administered by Member States and tailored to regional specificities, and for which there is no specific reference in EU regulation.

### ***Cross-compliance provisions***

*Cross-compliance* requirements are year-round obligations that are linked to annual Pillar 1 direct payments. This means that in order to submit their applications to receive direct payments, individual farmers must be in compliance with all SMRs and GAEC standards. Failing to meet these requirements can lead to a reduction in CAP payments to the farmer.

With the *CAP-post 2013* reform, some changes have been made to the *cross-compliance* system. The main changes that are in effect since January 2015 are: (i) all of the GAECs and most of the SMRs have been renumbered and some GAECs standards have been split or merged into other rules; (ii) in order to qualify for Basic Payment Scheme (BPS) and all the other payments, the land will need to be maintained in a state which makes it suitable for grazing or cultivation, and the farmer must meet the new *active farmer test*.

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<sup>64</sup>Cross-compliance was introduced in 2003 by Council Regulation (EC) No 1782/2003 of 29 September 2003 establishing common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers and amending Regulations (EEC) No 2019/93, (EC) No 1452/2001, (EC) No 1453/2001, (EC) No 1454/2001, (EC) 1868/94, (EC) No 1251/1999, (EC) No 1254/1999, (EC) No 1673/2000, (EEC) No 2358/71 and (EC) No 2529/2001.

**Table 1:** EU Framework for SMR Standards

SMR Number	Content	What changed with the 2013 reform?
SMR 1	Nitrate Vulnerable Zones (NVZs)	Formerly SMR 4
SMR 2	Wild birds	Formerly SMR 1
SMR 3	Habitats	Formerly SMR 5
SMR 4	Food and feed law	Formerly SMR 11
SMR 5	Hormones	Formerly SMR 10
SMR 6	Pig identification	No changes
SMR 7	Cattle identification	No changes
SMR 8	Sheep and goat identification	No changes
SMR 9	TSEs <sup>a</sup>	Formerly SMR 12
SMR 10	Plant protection products	Formerly SMR 9
SMR 11	Welfare of calves	Formerly SMR 16
SMR 12	Welfare of pigs	Formerly SMR 17
SMR 13	Welfare of farmed animals	Formerly SMR 18

Source: Defra, 2014. <sup>a</sup>Transmissible spongiform encephalopathies

Tables 1 and 2 summarize the new *cross-compliance* framework. Note that in Table 1, not all of the 13 SMRs are related to the environment; only SMR 1, SMR 2, SMR 3, and SMR 10 deal directly with environmental problems. For GAEC standards, on the other hand, Table 2 reflects the EU general framework of compulsory and optional standards to inform national settings of GAECs.

Member States enjoy a lot of flexibility in terms of how they apply *cross-compliance* within the limits of the regulation, as many details on design and implementation of these standards are left to their discretion. This provides much leeway to Member States to implement these measures in a way that meets local and regional needs, and has worked as a source of variation amongst Member States, particularly in relation to GAEC standards (Allen et al., 2012).

To give an idea of how different GAEC standards can look like, Table 3 contains GAEC buffer strip requirements from eight different Member States. As it can be seen, the require-

**Table 2:** EU Framework for GAEC Standards

<b>Issue</b>	<b>Compulsory Standards</b>	<b>Optional Standards</b>
<b>Soil erosion:</b> <i>Protect soil through appropriate measures</i>	<ul style="list-style-type: none"> <li>- Minimum soil cover</li> <li>- Minimum land management reflecting site-specific conditions</li> </ul>	<ul style="list-style-type: none"> <li>- Retain terraces</li> </ul>
<b>Soil organic matter:</b> <i>Maintain soil organic matter levels through appropriate practices</i>	<ul style="list-style-type: none"> <li>- Arable stubble management</li> </ul>	<ul style="list-style-type: none"> <li>- Standards for crop rotations</li> </ul>
<b>Soil structure:</b> <i>Maintain soil structure through appropriate measures</i>		<ul style="list-style-type: none"> <li>- Appropriate machinery use</li> </ul>
<b>Minimum level of maintenance:</b> <i>Ensure a minimum level of maintenance and avoid the deterioration of habitats</i>	<ul style="list-style-type: none"> <li>- Retention of landscape features, including, where appropriate, hedges, ponds, ditches trees in line, in group or isolated and field margins</li> <li>- Avoiding the encroachment of unwanted vegetation on agricultural land</li> <li>- Protection of permanent pastures</li> </ul>	<ul style="list-style-type: none"> <li>- Minimum livestock stocking rates or/and appropriate regimes</li> <li>- Establishment and/or retention of habitats</li> <li>- Prohibition of the grubbing up of olive trees</li> <li>- Maintenance of olive groves and vines in good vegetative condition</li> </ul>
<b>Protection and management of water:</b> <i>Protect water against pollution and run-off, and manage the use of water</i>	<ul style="list-style-type: none"> <li>- Establishment of buffer strip along water courses</li> <li>- Where use of water for irrigation is subject to authorization, compliance with authorization procedures</li> </ul>	

Source: Annex III of Regulation (EC) 73/2009.

**Table 3:** Wide Variation in GAEC Buffer Strip Requirements Across Member States

<b>Country</b>	<b>Buffer</b>	<b>Practice</b>
UK	between 2m and 10m, depending on the kind of input applied	maintain green cover (2m) and may not apply fertilizers or pesticides (10m)
Denmark	minimum 2m	no cultivation, soil treatment or planting
Greece	between 1m and 6m depending on slope and type of restriction	no cultivation (1m) or nitrogen fertilizers (2 or 6m)
Spain	2m to 10m	compulsory scrub; no fertilizers or pesticides
France	5m	compulsory grass cover, shrubs, bushes or trees; no mineral, no organic fertilizers, and no pesticides
Italy	between 5m and 3m depending on the state of the water body	compulsory grass cover, no tillage, no inorganic fertilizers, no manure or slurry
Netherlands	between 25cm and 9m depending on the crop and certain technical specifications	no fertilizers
Slovakia	10m	no industrial or organic fertilizers

*Source:* ECA, 2014.

ments vary not only in terms of the size of the buffer strip, but also with respect to the actions and practices farmers are expected or prohibited to take within their buffer zones. For example, across the eight countries observed the minimum width of buffer strip can range from 25 centimeters (Netherlands) to 10 meters (UK, Spain and Slovakia). Moreover, in some Member States, certain categories of water bodies are exempt from GAEC on buffer strip, even though these water bodies are not always properly defined, and the exemptions granted are not grounded on scientifically-based justification.<sup>65</sup> If an increasing number of water courses are not obligated to comply with the buffer strip requirement, the potential benefits of GAEC for water quality may be undermined.

<sup>65</sup>For example, in Italy, water courses shorter than 5 kilometers or belonging to a catchment area measuring less than 10 square kilometers do not require buffer strip. On the other hand, in Spain, ponds, irrigation channels and ditches are generally exempt from GAEC on buffer strip.

## ***Implementation***

Because Member States are in charge of implementing *cross-compliance* measures at the individual farm level, two major challenges arise from this system. First, implementation of SMRs requires effectively integrating specific elements of EU regulation into national or regional legislation and concretely defining SMRs to fit national priorities and conditions (*harmonization*).<sup>66</sup> Only a few concrete farm level SMRs have been legally defined at farm level by the Commission. Second, the implementation of GAEC requirements entails the design and establishment, by national authorities, of relevant standards and prescriptive managements practices farmers are expected to implement, leaving considerable scope for variation in national definitions.<sup>67</sup> As a result, some Member States have defined very light and flexible standards for *cross-compliance* to minimize administrative costs and reduce risk of cuts on CAP funding (Farmer & Swales, 2004).

Member States are responsible for informing farmers about these requirements and establishing an administration and control system that allows a sample of beneficiaries to be verified for compliance. Penalties, in the form of payment reductions, are imposed on farmers who fail to comply. Progress in implementation has largely varied across the wide EU, with gaps observed in various Member States (Farmer & Swales, 2004; and Bennett et al., 2006). In order to track implementation, all the information collected by Member States through farm level verification audits is submitted to the EU Commission, which is in charge

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<sup>66</sup>Because national authorities are required to enforce farmers' compliance with these standards, this has the potential to strengthen the application and enforcement of EU environmental standards in agriculture at the Member State level. Poor enforcement or delays in implementation may lead to penalties, including reduction on CAP transfers.

<sup>67</sup>For example, when defining soil protection and management requirements for uncultivated land.

of overseeing implementation of SMR and GAEC standards through a desk review process. However, inconsistency and incompleteness of data reported by Member States has led to gaps in monitoring and enforcement of *cross-compliance* implementation.

Improving monitoring and enforcement capabilities at both Member State and the EU levels should be a priority to ensure farmers' full compliance with mandatory standards. This requires developing and applying more operational agri-environment indicators, improving data collection and availability, and further developing mapping capabilities. Besides facilitating the monitoring of *cross-compliance*, these instruments can inform adaptive management, and help Member States and the EU to set priorities for the design of future policies. Lastly, strengthening the national Farm Advisory Systems (FAS)<sup>68</sup> to make sure farmers are receiving the appropriate assistance to understand and implement standards is crucial for the successful implementation of *cross-compliance*.

Because *cross-compliance* are mandatory to all farmers accessing CAP payments, it has been the major source of environmental regulation through subsidies. Despite this potential, *cross-compliance* has partially failed to achieve real improvements on the ground. Other standards remain to be integrated into the set of *cross-compliance* requirements. These include, for instance, other water quality and quantity standards set under the WFD, and soil conservation standards that were to be established under the proposed EU Soil Directive.<sup>69</sup>

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<sup>68</sup>An evaluation carried out by the Commission (COM, 2010) pointed some of the problems with implementation of Member States' FASs suggesting the need for improvements. These include: (i) extending the scope of the FAS to encompass issues that go beyond cross compliance requirements, (ii) make it clear that FASs are designed to assist not only farmers receiving CAP payments, but all farmers, (iii) distinguishing between advisory and monitoring services, (iv) promoting farmers' awareness about the FASs services, and (v) improving the management of these advisory systems.

<sup>69</sup>In September 2006, the European Commission (EU) adopted a Soil Thematic Strategy (COM(2006) 231) in order to provide a comprehensive common framework for protecting soils across the European Union. However, because no agreement was reached, in April 2014 the Commission withdrew its proposal, frustrating

Although there are *cross-compliance* standards addressing other environmental issues such as biodiversity and soils (e.g. GAECs to protect soils from erosion and establishing minimum of level soil cover), for practical reasons, this thesis only critiques standards targeted at water quality and quantity. The other aspects of *cross-compliance* will be object of future research.

### ***How does cross-compliance address water issues?***

There is sufficient evidence to sustain that agriculture remains the single sector most affecting water quality, typically through diffuse pollution processes (EEA, 2010a). Six *cross-compliance* requirements have a direct impact on water quality and quantity. Their implementation at the Member State level, however, has faced many challenges, with status of water quality varying significantly across Europe. For instance, violations of *cross-compliance* rules protecting water in Nitrate Vulnerable Zones (NVZ)<sup>70</sup> have been observed

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promises to improve soil protection in the EU. Supporters of the directive have argued that a soil directive is important to help fight climate change because of the role soil plays as a carbon repository. Environment ministers from some Member States (in particular, the UK, Germany, Austria) however, have taken the position that the directive would interfere with their existing soil management measures and that it would be too costly to justify its environmental benefits. At the moment, only a few EU Member States have specific legislation on soil protection.

<sup>70</sup>In place since 1991, the EU Nitrates Directive (ND) regulates nitrate pollution of ground and surface waters from agricultural sources. Under this Directive, Member States are in charge of identifying polluted and threatened water bodies and designating Nitrate Vulnerable Zones (NVZ), within which farmers are required to implement compulsory action programs respecting a Code of Good Agricultural and Environmental Practice (CGAEP), and taking additional measures when necessary, such as manure processing and restricting fertilizer application. Implementation of the Nitrates Directive has become an integral part of the WFD. However, after more than twenty years since the ND has come into force implementation remains a challenge for some Member States. For instance, in 2013, cases of violation related to the correct and complete implementation of the directive, as well as the appropriateness of the action programs were still being litigated against eight Member States (Bulgaria, Germany, Estonia, Greece, France, Latvia, Poland and Slovakia) (ECA, 2014). Among the cases ruled by the European Court of Justice are claims that some Member States, such as France, had failed to designate several areas as Nitrate Vulnerable Zones, where nitrate concentrations in ground water were above 50 mg/l (the maximum concentration allowed in drinking water) or the surface water risked eutrophication if no action plans were implemented. When implementing the Nitrates Directive, Member States present nitrate action programs with varying degrees of ambition. Because these programs do not require approval by the Commission, there are significant differences among the criteria used by Member States when defining vulnerable zones or the actions to be taken. Recent EEA

in many Member States. These include inadequate storage of manure, inefficient application and monitoring of fertilizers, absence of nutrient management plans, and nitrate output beyond maximum levels (ECA, 2014). Problems with the implementation of other *cross-compliance* rules related to groundwater protection, *plant protection products*, and buffer strip have also been identified (ECA, 2014).

Water *cross-compliance* requirements also continue to leave out standards to limit the use of phosphorus<sup>71</sup> on farmland and to control the application of pesticides<sup>72</sup> near water bodies. Pesticides are widely used as a strategy to protect plants and crops from damage caused by weeds, diseases and insects, and are generally identified as *plant protection products*. Only for certain very dangerous pesticides, Member States can, when authorizing their use, establish buffer zones along water courses in which spraying is prohibited. It is worth mentioning, however, there have been initiatives in some Member States to control pesticide use, by adding restrictions in GAEC provisions on buffer strip. Moreover, the Commission has not specifically defined the GAEC standards on irrigation systems such as water abstraction permits, water meters, and reporting on water use; leaving the matter to be regulated under existing national or regional legislation, when these exist.

Although *cross-compliance* has generally increased awareness among farmers and triggered some changes in farming practices particularly in relation to water (ECA, 2014), its

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reports show that the current trend in nitrate levels across the EU is not likely to reach good status even by 2027. Therefore, despite progress made on nitrate concentrations partly due to measures to reduce nitrate inputs in agriculture, additional measures are needed to reduce diffuse pollution if the majority of water bodies are to achieve high or good ecological status by 2027. The pressures from agriculture on water bodies continue to be significant. Diffuse and point source pollution by nitrogen was reported in 91 percent of the dRBMPs evaluated, phosphorus in 90 percent of the cases, and pesticides in 69 percent of them (EEA, 2011).

<sup>71</sup>Nitrogen application is controlled under the integration of water quality standards under the Nitrates Directive into *cross-compliance*, with control of Nitrate Vulnerable Zones (NVZ).

<sup>72</sup>See *infra* note 21.

impacts on overall water quality and quantity across European farmland have so far been limited. Part of the problem lies in intrinsic limitations of the *cross-compliance* system in both designing standards and verifying compliance. This occurs because some requirements are very difficult to check, whether because inspector visits are usually notified in advance, or because some elements of compliance can only be checked during a certain period of the year or at certain conditions, which may not always coincide with the timing of the inspection (ECA, 2014).

Implementation of *cross-compliance* standards is further eroded by a weak enforcement system. Penalties applied to non-compliant farmers do not account for the environmental and economic costs of violation, compensating only a portion of direct and indirect costs of environmental damage. In this sense, *cross-compliance* has failed to apply the *polluter-pays-principle* to hold accountable non-compliant farmers. For instance, in the Netherlands, although phosphorus requirements have been included into nitrates action programs, violations of those standards are not subject to penalties.

### **5.2.2 2013 Greening Measures (Pillar 1)**

Instead of raising the *cross-compliance* baseline in Pillar 1 or favoring the transfer of funds to more targeted measures in Pillar 2, the Commission's strategy in the *CAP-post 2013* went in a different direction, and set forth new *greening measures* that are now tied to 30 percent of Pillar 1 direct payments.

When initially proposed by the Commission, these measures were intended to apply to all farmers receiving direct payments, and were supposed to represent a step further in

environmental performance beyond *cross-compliance*. The Commission preferred the new *greening measures* to be applied to Pillar 1 because of the simplicity and enforceability of its annual measures. Implemented under Pillar 1, greening offered the possibility for a broad scale coverage of standards beyond that currently possible through voluntary and selective agri-environment schemes (Allen et al., 2012). More importantly, greening would provide an additional justification for maintaining the Pillar 1 budget of the CAP by raising the environmental baseline of CAP direct payments (Matthew, 2013a).

Despite all these promises, the final rule approved in 2013 significantly watered down important elements of the Commission's proposal, to such an extent that the additional benefits for the environment are expected to be minimal (Matthews, 2013b). Several exemptions were granted and loopholes were included in the final deal. Recent estimates suggest that at least 88 percent of EU farmers and about 50 percent of farmed land will be exempt from the new *greening measures* (Pe'er et al., 2014). For Matthews (2013), the EU has missed a great opportunity to take a step forward on making the CAP fit for the 21st century, and meeting the food, natural resources and territorial challenges of the future.

Chapter 3 of the Regulation (EU) 1307/2013 entitled 'Payment for agricultural practices beneficial for the climate and the environment' sets out the greening payments component in more detail. Article 43(2) identifies the three greening practices as: (i) *crop diversification* (also labeled as crop rotation); (ii) maintaining existing *permanent grassland*; and (iii) having *Ecological Focus Areas (EFA)* within the agricultural area. These practices are further defined in Articles 44 to 46, respectively.

*(i) Crop diversification*

Over the last century, the world has lost 75 percent of its crop varieties. Today, 75 percent of the food we eat comes from only 12 plants (including corn, soybeans, wheat, etc.) and 5 animal species (BirdLife and others, 2011). Less diverse agricultural systems have become a reality to many farming communities across the world, with large implications for soil quality and composition (EEA, 2004). Crop monocultures also have been determined to impact biodiversity of agro-environments and reduce natural habitat for birds, pollinators and other beneficial insects (Garibaldi et al., 2013). This occurs because most large-scale conventional agricultural systems exhibit poorly coordinated farm components, with almost no integration between crops, soils, and animals, otherwise known as permaculture, biodynamic systems, etc. Emphasis on efficient food production systems supported by CAP intervention mechanisms also has encouraged continuous arable cropping, winter cereals, and minimal rotations, all resulting in negative consequences for the soil (Ingram & Morris, 2007).

At the same time, a vast array of studies have linked crop diversity to several environmental and agronomic benefits, including greater stability of natural ecosystems (Tilman et al., 2006; and Harrison, 1979), reduced yield variation, and improved crop resilience to multiple environmental stresses (Gaudin et al., 2015). These are advantages that are tremendously valuable for today's agriculture given expected changes in climate, and increasing global demand for agricultural products. Crop diversification can improve agricultural resilience in a variety of ways. For example, by promoting a greater capacity to control pest occurrences and reduce pathogen transmission, which may worsen under future climate scenarios, and by buffering crop production from the effects of greater climate variability and extreme events

(Lin, 2011).

Aware of these threats and opportunities for the long term viability of European agriculture, scientists and politicians have proposed changes in land use and management to improve European crop diversity. For over a decade, *crop diversification/rotation* has been set as an optional GAEC standard, and in some Member States it has been adopted as a soil conservation measure under agri-environment schemes. However, despite its proven benefits, adoption of *crop diversification* among European farmers, although improving, has been limited. Economic incentives encouraging production of a selected few crops, the push for biotechnology strategies, and the general belief that monoculture is more productive than diversified systems are among the reasons why farmers have not been apt to diversify their farming systems. Thus, by making *crop diversification* one of the new mandatory *greening measures*, the EU hopes to improve its adoption across European farmers.

Also known as the *2 or 3 crops rule*, *crop diversification* requires landowners to grow at least two or three varieties of crops on their arable land, depending on the farm size and the type of crops grown. If a farmer has between 10 and 30 hectares of arable land enrolled in direct payments, he/she will have to maintain at least 2 different crops, where the largest crop must not cover more than 75 percent of the total arable land. Alternatively, if a farmer has more than 30 hectares of arable land, at least 3 different crops will have to be grown; where the largest must not cover more than 75 percent of the arable area, and the two largest crops together must not cover more than 95 percent of the arable land.

Temporary grassland<sup>73</sup> or fallow land can count as the main crop if: (i) it covers more than

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<sup>73</sup>Temporary grassland is land that has been in grass or other herbaceous forage for less than 5 years (Defra, 2014)

75 percent of the arable land, and (ii) the remaining arable area is larger than 30 hectares. In this case, the farmer will not need to reduce the percentage covered by temporary grassland or fallow land. However, at least 2 other crops need to be grown on the remaining arable land, and the main crop on this remaining arable land must not cover more than 75 percent of this land.

Several exemptions to the *crop diversification* rule were included in the final CAP agreement, however (Table 4). Any farmer who qualifies for the exemptions will receive the greening payment without having to do anything differently. Aside from these exemptions, permanent crops<sup>74</sup> and all farmers enrolled in the Small Farmer Scheme<sup>75</sup> also were generally exempted from *crop diversification*. To put this into perspective, small landholdings (<10ha) represent 92 percent of all arable holdings in new Member States and 13 percent of the total arable area across the EU (Pe'er et al., 2014).

Questions remain about whether applying the *2 or 3 crops rule* in intensively managed farms will be an effective strategy to enhance biodiversity. Add to this the fact that these 2-3 crops targets are even lower than the current average crop diversity at the farm level in

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<sup>74</sup>Permanent crops mean non-rotational crops other than permanent grassland and permanent pasture that occupy the land for five years or more and yield repeated harvests, including nurseries and short rotation coppice (Regulation (EU) 1307/2013).

<sup>75</sup>Wide variation and big contrasts exist in farm structures across the EU. In total, the EU-28 has approximately 12.2 million farms with an average size of 14.2 hectares. A large number (6 million) of these holdings are considered very small (less than 2 ha in size) and take only 2.5 percent of the total land area used for farming in the EU. A small number (2.7 percent of all holdings) consists of large landholdings (over 100 ha) that farm 50.2 percent of the EU farmland. 44.6 percent of the farms have a standard output below €2,000, and most of the smaller farms are characterized as semi-subsistence farms, meaning that more than 50 percent of their output is self-consumed. Defining small farmers can follow various criteria, including farm size, the use of family labor, farming output, and the percentage of self-consumed outputs. Establishing a common definition of small farm across the 28 Member States remains a challenge for the EU, with each Member State having their own definition (COM, 2011). For instance, in the UK, small farms are those with less than 5 ha of arable land, which are not entitled to BPS payments, but qualify for Small Farmers Scheme. In Germany, on the other hand, farms with less than 95 ha can participate in the German Small Farmer's Scheme as they qualify as small and medium enterprises (SME).

**Table 4: Crop Diversification Exemptions**

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**Exemption A**

More than 75 percent of the arable land is under:

- fallow land
- temporary grassland
- a combination of the above and the rest of the arable land is 30 hectares or less

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**Exemption B**

More than 75 percent of the total eligible agricultural area is under:

- permanent grassland
- temporary grassland used for the cultivation of crops grown in water
- a combination of the above and the rest of your arable land will be 30 hectares or less

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**Exemption C (transitioning from SPS to BPS)**

The farmer has new land and different crops. There are two parts of this exemption:

1. More than 50 percent of the arable land declared on the BPS application was not declared on the SPS application in the previous calendar years and
2. All the arable land parcels declared on the BPS application must be used to grow a different crop from the previous calendar year

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*Source:* Adapted from Defra, 2014.

many Member States. Further undermining the system is a complete lack of requirements regarding eligible crop types or rotation. All these factors combined challenge the ability of the *crop diversification* measure to deliver real benefits to biodiversity and soil quality, and to reverse the level of landscape homogenization in the EU.

***(ii) Permanent grassland***

*Permanent grassland*<sup>76</sup> can provide several environmental benefits. In particular, it can serve as habitat for a vast number of species and has a great capacity to sequester and store carbon (Ward et al., 2014). Compared to other farmland uses, *permanent grassland* under extensive use are of exceptional importance for biodiversity. However, driven by CAP intervention mechanisms, abandonment of semi-natural grassland in marginal areas has led to continuing decline of farmland biodiversity.

Several EU policies and regulation targeting biodiversity and GHG have been used to protect *permanent grassland* (e.g. directives on habitats and birds). For instance, various types of *permanent grassland* have been listed in Annex 1 of the Habitats Directive as farmland habitats that require continued farming use for their conservation.<sup>77</sup> Recognizing the role of agriculture in maintaining and enhancing the protection of these habitats, *permanent grassland* has also been addressed in some CAP *cross-compliance* requirements, and targeted in agri-environment schemes in some Member States.

These efforts, however, have not been enough to maintain or improve current level of *permanent grassland* cover across European farmland. In fact, recent estimates show that

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<sup>76</sup>Pursuant to Article 4 of Regulation (EU) 1307/2013, any land that has been covered by grass or herbaceous forage naturally (self-seeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for more than 5 consecutive years can qualify as *permanent grassland*.

<sup>77</sup>Some 40 of the approximately 200 habitats listed consist of *permanent grassland*.

grassland habitats have decreased in cover by 6.4 percent between 1993 and 2011 in the EU, and by 11.8 percent in new Member States, giving rise to biodiversity loss and GHG emissions (Pe'er et al., 2014).

In an attempt to improve protection of these high conservation value ecosystems, the latest CAP reform has set the maintenance of *permanent grassland* as one of the new *greening measures*. However, rather than working toward maintaining and improving the conservation status of these habitats, the CAP final rule allows for a reduction of up to 5 percent in the net area of *permanent grassland* at national or regional level, and also has established several exemptions that open up doors for further conversion.

The *permanent grassland* rule can be divided in two parts. First, the percentage of *permanent grassland* in a Member State - compared to the area of agricultural land - may not fall by more than 5 percent. If the actual ratio falls by more than the 5 percent threshold, individual farmers who have plowed *permanent grassland* may be required to restore it. Second, areas of *permanent grassland* that are covered by the Birds and/or Habitat Directives (*Natura 2000* sites) cannot be plowed up irrespective of the total amount of grassland currently maintained at the national level.

Farmers are required to identify the amount of *permanent grassland* they have on their lands, as this will count toward their eligible agricultural area<sup>78</sup> for payments and will help determine if they qualify for any exemptions from greening. For instance, exemptions to *permanent grassland* greening apply to land covered by *permanent crops*. These areas represent 9.3 percent of the total agricultural area across the EU.

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<sup>78</sup> *Eligible agricultural area* consists of any area taken up by arable land, permanent grassland, or permanent crops (Regulation (EU) 1307/2013).

If a land parcel that meets the definition of *permanent grassland* contains scattered trees, it will only be classified as *permanent grassland* if it is suitable for agricultural production, and does not have more than 100 trees. This rule has been highly criticized by environmental groups because of its lack of agronomic and ecological basis, as pastures with a high density of shrubs and trees have been in active use by farmers for thousands of years. If sustainably use, high density grassland can provide several benefits, including sustaining biodiversity and landscapes, and helping control fire occurrences (BirdLife and others, 2011).

Besides wide exemptions, no habitat quality and management criteria have been set to ensure farming operations on *permanent grassland* will be performed appropriately, thus no safeguards exist to further degradation. Furthermore, outside the areas identified within *Natura 2000* sites and protected by Member States as high conservation value grassland no restrictions apply. This means that outside protected sites, farmers will still be able to convert low-input, extensively managed, species-rich grassland to highly intensified, uniform, species-poor farmland. The potential to maintain grassland biodiversity is further undermined by incomplete mapping, lack of differentiation among regions and grassland types, and a focus on net area without consideration of continuity and connectivity of existing semi-natural grassland parcels (Pe'er et al., 2014).

### ***(iii) Ecological Focus Areas***

The EFA concept has been drawn from the Swiss model of Ecological Compensation Areas,<sup>79</sup> and also borrowed from elements and specific practices implemented under entry-

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<sup>79</sup>The Swiss Ökologischer Leistungsnachweis (ÖLN) was developed as a proposed means of retaining the environmental benefits of set-aside following its abolition under the 2008 CAP Health Check. This policy measure is already used in Switzerland, where farmers are required to keep seven per cent of their land as

level type agri-environment schemes in some Member States (Allen & Hart, 2013). *Ecological Focus Areas (EFA)* are areas and/or landscape features which the EU has identified are beneficial for the climate and the environment. Under the new *greening measures*, farmers with more than 15 hectares of arable land must set aside at least 5 percent of their total eligible land as EFAs.<sup>80</sup> As referred to in Article 46 of Regulation (EU) 1307/2013, these include areas not used for production, such as: land left fallow, terraces, landscape features, buffer strip, agro-forestry areas, forest edges, and afforested areas.

There were initial promises that EFAs would contribute toward a range of different environmental objectives, including biodiversity, soil and water quality, climate change mitigation and adaptation, pest control, landscape protection, and pollination (CEC, 2010b). The CAP final regulation provides that EFAs should serve, in particular, to safeguard and improve biodiversity on farms. However, other less ecologically-focused land-uses were added to the final list of qualifying areas, which were classified as land under low-input agricultural management.<sup>81</sup> These include land covered by nitrogen-fixing crops (legume crops), catch crops, green cover crops, and areas with short-rotation coppice.

Although land under low-input agricultural management can help maintain soil and water quality to some extent, few empirical evidence exists to show they can improve biodiversity.<sup>82</sup>

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'ecological compensation areas' as a precondition to receive direct payments.

<sup>80</sup>The Commission proposal required farmers to ensure at least 7 percent of their eligible hectares, excluding areas under *permanent grassland*, as EFA.

<sup>81</sup>As long as there is no use of mineral fertilizer and/or *plant protection products*.

<sup>82</sup>While the positive effect of plant species richness on productivity is uncontroversial, doubts have been raised about the long-term stability of this relationship and its relevance for applied conservation. For instance, some studies have show that implementation of AES targeted at increasing the population of pollinators can have a positive effect on yields (Bullock et al., 2007; Klatt et al., 2014. More specifically, Bullock et al. (2007) show that the restoration of species-rich communities of conservation value can increase agriculturally relevant hay production and that this effect is maintained over at least 8 years.

In fact, in some cases adverse impacts may result from their cultivation (e.g. from ploughing, stubble incorporation, application of pesticides) (Ehlers et al., 2014). In the case of nitrogen-fixing crops, for instance, ecological benefits largely depend on the management practices implemented and the crop species grown. Although these crops have a potential to increase structural diversity and positively impact soil fertility, sufficient added value in terms of species diversity is unlikely to be achieved in the absence of mandatory management requirements.

Another aspect that might open some loopholes on how EFAs are implemented is the establishment of the *weighting factors* for certain types of landscape features or land-uses. Member States are free to set these *weighting coefficients*, taking into account the ecological significance of the eligible features and land-uses. An EFA weighting matrix can be useful in principle, especially for areas subject to productive use. However, it can open gaps for Member States to make compliance more flexible to farmers, and ultimately lead to a reduction of the total land actually devoted to EFAs. For instance, in the UK hedges and buffer strips were set weights of 10 and 9, respectively. That is, every 1 meter of hedges is worth 10 square meters of EFA area.<sup>83</sup> In such a diluted form, and lacking specific management guidelines, EFAs are expected to contribute little to biodiversity and other ecosystem services.

Other implementation challenges are likely to reduce EFA's potential to deliver environmental benefits. First, the implementation of AES type measures in the form of EFAs within

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<sup>83</sup>The way this system works is that, for example, if certain landscape feature is declared eligible for EFA purposes and a weighting factor of 0.3 is applied to it, it means that 15 hectares of this landscape feature would qualify as 4.5 ha of EFA ( $15 \times 0.3 = 4.5$ ).

the scope of CAP Pillar 1 will be limited by the bounds of the direct payments regulation. This means EFAs will have to encompass simpler practices so they can be implemented with minimal cost and technical advice, be established annually in line with direct payments, and follow a non-contractual format so farmers can change their practices and feature locations every year. This raises the question as to the potential impacts of changing the selection and management of EFA features between years (Allen et al., 2012). In addition, in order to qualify as EFAs, landscape features must be located within the farm's *eligible agricultural area* for direct support. This restriction can be an issue for those traditional landscape features that are not farmed (e.g. hedgerows, stone walls, buffer strip), as they are often excluded from the *eligible agricultural area* in most Member States, and are generally not mapped or recorded on the EU Land Parcel Identification System (LPIS).<sup>84</sup> Technical and structural capacity to map and record these ecological features is not only important to allow them to be counted as EFA, but also to support their implementation, monitoring and evaluation, and integrate them into broader water quality and biodiversity policies. Inevitably all of these shortcomings are likely to affect the delivery of environmental benefits through EFAs.

Further undermining EFA's potential to provide additional ecosystem functions and services is a provision that generally exempts from EFAs: (i) small farmers,<sup>85</sup> (ii) farms with permanent crops, and (iii) grasslands or pastures. The farm size threshold exemption will keep at least 88 percent of EU farms and over 48 percent of the farmed area free of EFA

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<sup>84</sup>The Land Parcel Identification System (LPIS) is the key component of the Integrated Administration and Control System (IACS) for area based subsidies. It is the modern supporting tool in the form of a spatial register used within an IACS environment that helps the farmer who intends to apply for aid under any of the area-related aid schemes to register agricultural reference parcels considered eligible for annual payments of CAP subsidies.

<sup>85</sup>Farms up to 15 hectares.

(Pe'er et al., 2014). For the remaining areas, any combination of Article 46 measures can count as EFAs.

Other landscape features and types of management can still qualify as an EFA. The task of defining them has been left to Member States' discretion, and thus will be further elaborated during the implementation process. Farmers also will enjoy some sort of flexibility in deciding which features and areas to devote to EFAs. While flexibility at the farm level may give farmers more room to adapt the new requirements to their agronomic and market needs, it also offers the possibility for farmers to choose the easiest or least costly option of compliance. This might not always be the best if the rationale behind EFAs is to maximize environmental benefits.

One way to ensure that EFAs will effectively deliver the ecological benefits they are intended to is through making sure their implementation will include: (i) environmental targeting and tailoring; (ii) a mix of features and land types throughout different locations within the farm; (iii) retention of EFAs for periods greater than one year; (iv) imposing limits to agricultural operations that can be carried out in EFAs (e.g. limited fertilizer application or no-trimming seasons); and (v) promoting the implementation of best management practices within EFAs (Allen et al., 2012; and Poláková et al., 2011).

In general terms, the greater the proportion of uncultivated land on a farmed holding, particularly if it is managed for environmental purposes, the greater is the positive impact on the environment (Butler et al., 2010). However targeted interventions have been shown to deliver greater environmental benefits within a smaller area provided they are in the right location, are retained for a significant period of time and managed in an appropriate way

(Hart et al, 2011).

Thus, the relative impact of an EFA in a given landscape will largely depend on farmers and experts' capacity to target different types of EFAs in relation to granular characteristics of the field, and taking into account the precise objectives sought. Strategies of landscape planning and spatial analytics can play an important role in defining what kind of EFAs should go where. For instance, the more permanent and in-situ the traditional features that could form EFAs are (e.g. hedgerows, stonewalls, terraces, and infield trees), the greater the potential to meet landscape objectives, particularly within intensive arable land, as they will help to provide structure and variation within the landscape (Allen & Hart, 2013).

The delivery of certain objectives will be influenced more by some factors than others, so trade-offs may need to be addressed depending on the targets initially set. Economic incentives and technical tools to support decision-making can play a key role. Also, the design and implementation of some EFAs will require the coordination of trans-boundary efforts, particularly to address landscape level issues, rather than relying purely on individual farmers' decisions. The location of an EFA within a holding and across the farmed landscape has a direct relationship to the type, range and level of environmental benefits they have the potential to deliver. This is why, in some cases, a combination of different locations within the holding may be required in order to deliver the greatest level or range of benefits.

Perhaps one of the biggest challenges for scientists, practitioners, and farmers moving forward is to develop strategies that combine the most effective measures with the most practical approaches.

## *Challenges Moving Forward*

From a policy effectiveness stand point, one of the biggest questions surrounding *greening measures* is how they can fit with existing CAP standards. Although there are important elements that distinguish *cross-compliance*, *greening* and AESs, in practice,<sup>86</sup> there are similar elements related both to management practices and environmental features that are covered jointly by each of these measures. For example, there is a clear link between EFAs and AESs as both are considered more targeted measures. The same thing can be said about the *crop diversification* rule and its link to the existing *cross-compliance* standard on crop rotation (e.g. GAEC on crop rotation). *Permanent grassland* also areas are subject to a greater proportion of the current GAEC standards, partly due to animal welfare rules. Putting these standards under the umbrella of *greening* offers the advantage of making them compulsory to farmers, thereby engaging a significant proportion of farmers in a set of simple, generalized, annual, non-contractual measures as conditions to receive full direct payments.

From the perspective of farmers, the major concerns over *greening* are regarding: (i) the eligibility of existing features as equivalent measures;<sup>87</sup> and (ii) the possibility to adapt some obligations in order to fit agronomic priorities, and minimize the impacts of compliance on profitability and practicality (Allen et al., 2012).

The system of equivalent measures has raised concerns regarding double funding (Hart,

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<sup>86</sup>For example, whether they are compulsory to farmers, if there is scope for Member States to implement them in different ways, if they are annual or multi-annual contracts, if they are considered above current reference level.

<sup>87</sup>These are farming systems and practices that have been recognized as delivering similar environmental benefits as expected by greening. They include, for example, organic farming and farmland that has been under some kind of agri-environment scheme. Member States can recognize at the national level what kind of equivalent measures will automatically qualify for greening payments. In order to qualify, organic farms need to be formally certified by an accredited body.

2012),<sup>88</sup> as farmers will be paid twice for the same practice. Besides violating the double funding principle underpinning the rules for public expenditure in the EU,<sup>89</sup> by recognizing equivalent measures the EU reduces the level of environmental benefits that can be achieved through the use of the CAP budget.

### 5.2.3 Agri-environment Schemes (Pillar 2)

The agri-environment schemes (AESs) are the oldest and one of the most important mechanisms developed under the CAP Rural Development Regulation<sup>90</sup> to sustain less profitable, extensively-managed farms, and to mitigate the environmental impacts of agricultural intensification in the EU (Espinosa-Goded et al., 2013). First developed in 1985, it has gradually assumed greater prominence within the CAP, and since 1992 has become the only rural development measure compulsory for Member States to implement. Key EU rural development texts, such as the Community strategic guidelines for rural development and Regulation (EC) No 1698/2005, recognize key environmental issues to be addressed through AESs. Among them are: the conservation of biodiversity, the protection and sustainable management of natural resources such as water and soil, the mitigation of climate change through the reduction of greenhouse gas emissions, as well as the reduction of ammonia emissions and the

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<sup>88</sup>Double funding as supported by the Agriculture Committee would mean that, instead of working together to deliver increased environmental benefit, the two Pillars will both be paying for the same thing, with no overall increased benefit to the environment.

<sup>89</sup>No costs for the same activity can be funded twice from the EU budget according to Article 111 of Council Regulation (EC, Euratom) No. 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities (OJ L 248, 16.9.2002).

<sup>90</sup>Under the rural development regulation, Pillar 2 measures are organized according to three main themes, known as 'thematic axes'. These are: (Axis 1) improving the competitiveness of the agricultural and forestry sector; (Axis 2) improving the environment and the countryside; and (Axis 3) improving the quality of life in rural areas and encouraging diversification of the rural economy. Member States and regions are required to spread their rural development funding between all three of these thematic axes and to identify and track its performance in respect of common indicators of program results and impacts. AESs are only one of these schemes funded under the Rural Development Agenda.

sustainable use of pesticides.

AESs have been proven effective based on a number of studies (Bullock et al., 2007; Natural England, 2009; Tucker et al., 2010), and have shown the potential to deliver the most targeted outcomes provided they are well-designed, continuously-financed, and effectively-implemented.

### ***Funding to support implementation of AESs***

Because AESs are co-financed by Member States and the EU,<sup>91</sup> CAP Pillar 2 transfers are an important source of EU funding to ensure the long-term viability of sustainable farming in marginal, small scale and biodiversity rich farms. Despite its importance, the latest CAP reform did not move forward on modulation. Following historical trends, Pillar 2 budget has decreased in the last period at a greater rate than reductions in the overall budget for Pillar 1. This will likely have implications for environmental delivery within the framework of the Rural Development Regulation (RDR).

To put this into perspective, the total Pillar 2 funding declined by 18 percent compared to a 13 percent reduction in the Pillar 1 budget (EP, 2013). In absolute terms, the total amount devoted to Pillar 2 also is significantly smaller than what goes to Pillar 1 schemes. Only 25 percent of the CAP budget goes to Rural Development, and across Member States, on average, only 4 percent of total CAP transfers is spent on AESs (EEA, 2009). Another potential weakening of the AES budget comes from a new provision that allows Member States to divert up to 25 percent of their rural development budget to fund direct payments

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<sup>91</sup>Funding to support Member States' Rural Development Programs (RDPs) comes partly from EU transfers through the European Agricultural Fund for Rural Development (EAFRD) and partly from national and local governments, as well as the private sector.

under Pillar 1. Also, even though part of Pillar 2 funding (30 percent under the new CAP regulation) has been now earmarked for AESs, the money can be used to support other schemes that involve measures not specifically targeted to environmental objectives. These include, for example, climate change mitigation measures, organic farming, and climate-and-environment investment measures.

Generally, public financing of AESs is mainly sustained through agri-environment payments (EU transfers plus Member States top-ups). Agri-environment payments are meant to compensate farmers for the voluntary environmental measures implemented within their farms which go beyond the reference level set under *cross-compliance* and *greening measures*. These commitments are signed for a period between five and seven years,<sup>92</sup> with payments issued annually to farmers, and calculated based on farmers' forgone income and costs incurred with implementation. In some Member States, AES payments also have been conditioned on the delivery of actual outcomes, although this has not been the rule in most Member States.

With limited budget to sustain implementation of AESs, some Member States have explored other alternative payment options.<sup>93</sup> These have included, for example, Natura 2000 payments and payments linked to the Water Framework Directive. Attempts to integrate AES with broader wildlife conservation and water policies, however, have remained isolated. For instance, only 4 percent of Member States River Basin Management Programs indicated they would use Natura 2000 and WFD payments to pay farmers for the prescriptive actions

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<sup>92</sup>Following the procedures referred to in Article 90(2) of Regulation (EC) No. 1698/2005. For instance, in the UK, higher tier agri-environment schemes are contracted for a period of 10 years.

<sup>93</sup>As authorized under Regulation (EC) No. 1698/2005.

implemented through AESs.<sup>94</sup>

Other Member States have explored funding from the voluntary use of market-based instruments. Under these systems, farmers are entitled to compensation payments in the form of Payment for Ecosystem Services (PES) that are paid by beneficiaries. Among the advantages of independent PES systems is the fact that beneficiaries are free to compensate farmers for the public goods they provide, and are not constrained by changes on CAP compensation regulations. Another potential benefit of PES is the fact that the length of these agreements can be longer than the one established under the AES regulation, giving farmers more incentives to participate.<sup>95</sup> One challenge that might emerge from the implementation of PES systems is the potential for the free-rider problem when more than one beneficiary are involved. This, however, should not prevent PES from playing a strategic role in natural resources management across EU Member States.

Other financial instruments are yet to be fully explored by Member States. These include, for example, an additional funding of €3.8 billion made available through the CAP Health Check targeting new challenges identified as crucial for European agriculture such as climate change, renewable energy, water management, biodiversity, and dairy restructuring.<sup>96</sup> In

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<sup>94</sup>One of the reasons why Member States have not fully exploited WFD payments has to do with the fact that implementation guidelines were not issued until February 2010 (Commission Regulation (EU) No 108/2010) - 3 years and 2 months after the rural development program period had started (EAFRD 2007-13), and more than 1 year after the RBMPs were to be completed under Article 13 WFD.

<sup>95</sup>A PES program implemented in the Vittel catchment in the UK is an example of how long-term contracts can be more attractive to farmers and more effective in promoting positive impacts on ecosystem services. It was supported by an incentive package that included: (i) long-term security through 18 or 30 year contracts; (ii) abolition of debt linked to land acquisition; (iii) subsidy of about €200 ha-1 year-1 over five-years; (iv) up to €150,000 per farm to cover the cost of all new equipment and building modernization; (v) free labor to apply compost in farmers' fields; and (vi) free technical assistance including annual individual farm plans and introduction to new social and professional networks. Furthermore, in this scheme payments (PES) are not conditional on changes in the nitrate levels in the aquifer but are based on new farm investment and the cost of adopting new farming practices. Both nitrate rates and farm management are regularly monitored and recommendations for manure application are adjusted if necessary.

<sup>96</sup>Recital 3 to Decision 2009/61/EC on the assessment of the implementation of the Common Agricultural

addition, the European Economic Recovery Plan (EERP) provided an extra €1 billion to be spent on rural areas to address any of the new challenges.<sup>97</sup> Despite these opportunities, most Member States continue to make very little use of these extra funds, reaching an average allocation rate of only 17.5 percent in 2012 for the EU-27 (ECA, 2014).

As the latest CAP reform did not go very far on *modulation*<sup>98</sup>, funding for AES continues to largely rely on Member States' budget allocations and priorities. Here, the level of flexibility given to Member States in implementing their AESs can function both as a strength and weakness depending on how it is used. While some Member States have used this flexibility to prioritize environmental delivery, others have used it to focus only on farm modernization and competitiveness (EEA, 2009; Medina & Potter, 2015).

Besides budget constraints, the voluntary nature of AESs imposes limits to what can be achieved through these schemes. Ultimately, the degree to which environmental priorities and outcomes are delivered through AESs depends upon the choices and decisions made in the design of individual projects and their implementation.

Another factor affecting policy effectiveness and cohesion is the fact that most Member States do not usually include environmental and socioeconomic safeguards in other Pillar 2 programs. Safeguards have been set by some Member States to ensure that measures do not lead to negative impacts on the environment and the community. Others, on the other hand, have left room for substantial environmental and social impacts.<sup>99</sup> In addition,

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Policy reform of 2003.

<sup>97</sup>As one of the EU responses to the 2008 economic crises, the EERP was drawn by the European Commission.

<sup>98</sup>Transferring money from Pillar 1 direct payments to Pillar 2 Rural Development programs.

<sup>99</sup>In Spain, the design of rural development measures allows for the approval of projects that expand irrigated areas, putting more pressure on high conservation value ecosystems and threatening endangered species (OECD, 2008).

no appropriate mechanism exists to take into account the environmental costs of programs' spill over effects,<sup>100</sup> unless provided under national legislation, nor have these costs been used as a reference to calculate proportional reductions to rural development payments, following the *polluter-pays-principle*. Negative spill overs also may arise from weaknesses in the implementation of rural development measures, as in the case of ineffective inspections carried out to approve project applications, or when basic requirements to prevent negative impacts are not properly observed. Theoretically, Member States programs have to be submitted to the Commission for approval, when their potential impacts are supposed to be assessed. This screening process, however, has not been able to prevent substantial side effects from occurring as the Commission lacks the institutional capacity and political power to apply the necessary checks and balances.

### ***Outcome-based payments***

Currently, CAP rewarding mechanisms in AES follow an *practice-based* approach which artificially caps payments based on forgone income, direct costs incurred with compliance, and transaction costs (Franks, 2014). This means the system generally does not allow AES payments to be calculated on the basis of the actual outcomes provided. Contrasting with *practice-based* payments are *outcome-based* payments which aim at compensating farmers for the provision of actual results.

In Europe, a number of studies have highlighted the potential of *outcome-based* approaches to improve the environmental targeting of AESs and promote long-term behavioral changes in farming systems (Cooper et al., 2009; Schwarz et al., 2008; Burton and Burton

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<sup>100</sup>For example, the costs of preventing or cleaning up the pollution caused by farming operations

& Schwarz, 2013). In an attempt to translate scientific knowledge into policy and practice, a number of *outcome-based* AEMs have been tested and implemented in Austria, France, Germany, Netherlands, Sweden, Switzerland, and the UK (Schwarz & Morkvénas, 2012). The German MEKA program was the first example of an *outcome-based* payment to be implemented in a rural development program of a Member State. In this program, farmers can select the *outcome-based* component for species rich grassland in addition to an *practice-based* payment for extensive management of grassland.<sup>101</sup>

Despite the relatively small number and, in some cases, experimental nature of the *outcome-based* payments that have been implemented in Europe so far, they are beginning to reveal a number of key advantages in comparison to the mainstream *practice-based* payments. These benefits might emerge in the form of ecological, economic, and social/cultural shifts (Burton and Schwarz, 2013). Among the key advantages found are improved environmental targeting and ecological results, cost-effectiveness, greater farmer acceptance, longer term behavioral change, and the promotion of cooperation (Harden et al., 2013; Schwarz & Morkvénas, 2012).

*Outcome-based* schemes allow farmers to improve resource-use efficiency by applying measures that are most suitable to their operational and technological capacities and goals. Some pilot projects testing *outcome-based* approaches have shown that most participating farmers are able to reach environmental targets in a cost-effective manner, while keeping agricultural productivity high. For instance, Musters et al. (2001) show that paying Dutch farmers per

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<sup>101</sup>In 2010, nearly 50,000 ha of species rich grassland received the *outcome-based* support. However, the budget share of the *outcome-based* support for species rich grassland on the total grassland support is with 10 percent rather small (Schwarz & Morkvénas, 2012).

meadow bird clutches bred on their land is less expensive than compensating farmers for their income losses due to restrictions on farming practices.

A study by Matzdorf & Lorenz (2010), which investigates potential advantages and disadvantages<sup>102</sup> of *outcome-based* payments in Baden-Wuerttemberg (Germany), found that when well designed and implemented, AESs increase cost-effectiveness. The same study suggests also that greater flexibility provided by *output-based* schemes allows farmers to respond to site-specific conditions, leading to increased acceptability when compared to prescriptive measures. Discussions on these key advantages, however, remain to some extent either theoretical or based on researchers' first impressions, and have not yet been sustained by comprehensive empirical evidence.

One concern that has emerged from the implementation of *output-based* payments is the high level of risk and uncertainty in terms of the results to be achieved. This risk is particularly driven by farmers' lack of control over some of the factors driving outcomes. In order to reduce risk, some countries have adopted hybrid systems that consist of a combination of a flat-rate *practice-based* payment (risk free) and a *result-oriented* payment.<sup>103</sup> One of such AES scheme targeted at water quality has been implemented in Germany, where participating farmers situated in priority regions of the WFD have been required to: (i) keep N surplus below 30-40 kg N/ha on a 3-year-average on all arable land of the farm (result); (ii) participate in training courses on fertilization (action); and (iii) take measures to improve fertilization management (action).

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<sup>102</sup>The perceived advantages of output-based AES are flexibility, innovation, higher intrinsic motivation and improved continuous adaptation, while the potential disadvantages include higher transaction costs involved in control efforts, and increased risk for farmers.

<sup>103</sup>This is the case of the example given above on the German MEKA program.

### *Using agri-environment indicators to access outcomes*

Another challenge that might emerge from a broader use of *outcome-based* approaches within CAP AESs schemes is the requirement for regular monitoring and continuous policy adaptation to ensure outcomes match policy aspirations. As *outcome-based* schemes follow a dynamic process, the use of agri-environment indicators has become an increasingly helpful tool to keep track of individual and collective practices and results. These indicators can serve a variety of policy purposes, among them: (i) providing information on the current status and ongoing changes in the condition of the farmed environment; (ii) tracking the positive and negative impacts of agricultural practices on the environment; (iii) assessing the impact of agricultural and environmental policies on the environmental management of farmland; (iv) informing agricultural and environmental policy decisions; and (v) communicating to the broader public the relationships between agriculture and the environment (CEC, 2006).

The choice of indicators is a very important task in this process. The transparency of outcomes, their validation and measurement are other key factors to sustain payments and market credibility. Another challenge in implementing *outcome-based* approaches is in allowing enough flexibility to farmers in the range of indicators being used, while at the same time ensuring that indicators are specific enough to properly assess if objectives are being achieved. Therefore, indicators must be tested for robustness to ensure that they are capable of capturing causality between practices and results. Also, the choice of indicators must be scientifically based, following designed trials and pilot studies to test indicators' suitability in relation to the outcomes targeted. At the same time, indicators must be feasible and verifiable in terms of how they are measured. And more importantly, farmers and other

stakeholders must participate in the process of developing indicators in order to ensure that they are acceptable and identifiable (Burton & Schwarz, 2013).

To help inform the implementation process of AESs at the Member State level, the EU has set the Common Monitoring and Evaluation Framework (CMEF). Under the CMEF, agri-environment indicators are divided into four major categories: (i) baseline indicators, (ii) result indicators, (iii) impact indicators, and (iv) output indicators.<sup>104</sup> Under the CMEF framework, additional indicators can and should be developed by Member States to account for national priorities and site-specific factors. Although Member States enjoy wide flexibility with regard to assessment of results and impacts, additional indicators should be set in accordance with the general principles governing the use of indicators under the CMEF (COM, 2006).

### ***What can be learned from biofuels certification?***

While providing opportunities for rural development and serving as alternative energy sources to fossil fuels, the production of bioenergy when not properly managed can lead to

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<sup>104</sup>The baseline indicators, which are divided in objective and context related indicators, serve as baseline conditions for assessing changes in environmental quality after the implementation of agri-environment measures. They are divided into: (i) biodiversity indicators (measured by trends on population of farmland birds, UAA (Utilizable Agricultural Area) of high nature value farmland and forestry, and distribution of tree species groups); (ii) water quality indicators (measured by the status of gross nutrient balances, pollution by nitrates and pesticides, percent territory designated as nitrate-vulnerable zones); (iii) water use indicators (percent of irrigated utilized agricultural land, protective areas targeting soil and water quality); (iv) soil indicators (areas at risk of soil erosion and UAA under organic farming); and (v) climate change/air quality indicators (production of renewable energy from agriculture and forestry, UAA devoted to renewable energy and biomass crops, and greenhouse gases and ammonia emissions from agriculture). The output indicators are: (i) total area under agri-environment support, (ii) number of farm holdings receiving support, (iii) total number of contracts, (iv) number of actions related to genetic resources, and (v) physical area under agri-environment support. The result indicators then consist of assessing areas under successful land management contributing to: (i) biodiversity and high nature value farming/forestry, (ii) water quality, (iii) mitigating climate change, (iv) soil quality, and (v) avoidance of marginalization and land abandonment. And the impact indicators indicate whether the implemented measures contributed to: (i) reversing biodiversity decline (measured by farmland bird species population), (ii) maintenance of high nature value farmland and forestry, (iii) improving water quality (measured by changes in gross nutrient balance), and (iv) combating climate change (measured by increase in production of renewable energy).

negative ecological impacts, changing land-use patterns, socio-economic impacts and GHG emissions (Van Dam et al., 2008). These concerns have put the use and production of bioenergy crops worldwide under particular scrutiny, with sustainable production increasingly required for market access. The need to secure the sustainability of a fast growing bioenergy market has been widely acknowledged by various stakeholders, including governments, industry, growers, and civil society organizations. Over the years, a wide range of initiatives have undertaken steps toward the development of sustainability standards and biomass certification systems to address the undesired impacts of a growing bio-based economy. Addressing the more complex problems arising from land-use change, however, requires that all land-use systems follow sustainability standards and principles of good governance, going beyond bioenergy to apply to all agricultural producers regardless of the end-use of the product.

By tying agricultural subsidies to *cross-compliance* and *greening* standards the CAP attempts to address some of the environmental and socioeconomic concerns of agriculture. However, because European farmers are not required to formally verify compliance with these standards in order to access subsidies, little has been achieved in terms of improved conditions for public goods in agriculture. Instead, the maintenance and improvement of good environmental and socioeconomic conditions have relied largely on the implementation of more targeted agri-environmental schemes, which are subject to a EU-level monitoring and evaluation system under the CMEF framework.

The development of agri-environmental indicators under the CMEF provides means to improving the performance of rural development programs, ensuring their accountability, and

allowing an assessment on the achievement of established objectives. The CMEF follows similar structure used by third-party sustainability certification regimes, which typically require producers to assess baseline (or reference) resource conditions and then take actions to prevent degradation and ensure continuous improvement of resources. Certification schemes have been developed for a wide range of products to address multiples aspects, including the pursue of certain farming practices in order to maintain landscape features, restoration and maintenance of specific habitats, and the management of natural resources such as water and soils, for example (IEA Bioenergy, 2013; and Cooper et al., 2009). Table 5 presents a benchmark exercise from Van Dam et al., 2010, where various biofuels certification regimes are compared based on the environmental topics that are included in their standards.

**Table 5:** Environmental topics included in some biofuels sustainability standards

Indication of variety of environmental topics included in standards apart from 5.1 to 5.3. • Included as principle, ○ mentioned explicitly in criteria or included as separate criterion, and – not mentioned.

Topics:	EC-RED	US-RFS	NTA 8080	UK-RTFO	RSB	RSPO	RTRS	BSI	ISCC	SAN	Global-GAP	IIFOAM	FSC
Good (farming) practices	•	–	○	○	•	•	•	•	–	•	○	•	○
Waste	– <sup>b</sup>	–	○	○	○	○	○	○	–	•	•	○	○
Air	– <sup>b</sup>	–	•	•	•	○	–	○	–	–	○	○	–
Fire	– <sup>b</sup>	–	○	–	•	○	–	–	–	○	○	○	○
GMO	– <sup>b</sup>	–	–	–	○	○	–	○ <sup>c</sup>	–	–	–	•	○
Pesticide management	– <sup>b</sup>	–	○	○	○	○	○	○	•	○	○	•	○
No invasive species	– <sup>b</sup>	–	–	–	○	○	–	–	–	–	–	•	○
Hygiene, quality product <sup>a</sup>	– <sup>b</sup>	–	–	–	–	–	–	○ <sup>d</sup>	–	–	•	○	–

<sup>a</sup> Not referring to safety and hygienic conditions for employers.

<sup>b</sup> Note: regulation on good farming practices refers to EU regulations which include various environmental topics.

<sup>c</sup> To be discussed in mitigation plan.

<sup>d</sup> Criterion: “To continuously improve the quality of sugarcane and products from the sugar mill”.

Source: Retrieved from Van Dam et al., 2010

Similar to the CMEF structure, certification regimes generally follow an *outcome-based* approach aiming to achieve a certain standard, and operate under a number of principles, criteria and indicators designed to check certified operators’ compliance. Within the realm of outcome-based metrics, biofuels certification regimes generally follow either a *narrative* or *quantitative* measurement approach.<sup>105</sup> Both in CMEF and certification systems indicators

<sup>105</sup>Quantitative criteria are expressed in a way that specifies the precise, measurable levels of particular

are used as tools to assess how far the expected objectives have been achieved. In the CMEF, for example, the impact assessment is built up from the outputs and results of individual measures through the hierarchy of objectives.<sup>106</sup>

### ***Challenges facing implementation of CMEF indicators and outcome-based AESs***

Operationalization of the CMEF framework, like in certification, has presented challenges both in terms of quantifying and interpreting the results and impacts (ECA, 2013; and Endres et al., 2015). In the context of the CMEF, some gaps have been identified, for example, in the list of indicators, leading to piecemeal assessments and incomplete evaluation results. One of the problems has been attributed to some result indicators which use vague language when referring to, for example, measures that contribute to the ‘successful land management’ (*See infra* note 92 for more detail). Another problem has been identified in the impact indicator to assess improvements on biodiversity, which relies exclusively on farmland bird species population, leaving aside other equally relevant species, including aquatic species. Similarly, the impact indicator on water quality refers only to nitrates and phosphorus as pollutants, ignoring other potentially harmful substances. At the same time, no water quantity indicator has been established to assess water waste. Finally, the impact indicator to assess AESs’ contribution to mitigate climate change does not consider trends in GHG emissions.

There is a lack of systematic quantification of results and impacts, and clear gaps on data completeness, reliability, and consistency to properly measure most of the CMEF agri-environment indicators. Not only data are not always available for all Member States, but

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indicator. When indicators cannot be precisely measured, narrative criteria are used to express a parameter in a qualitative form.

<sup>106</sup>This is a tool that helps to analyze and communicate program objectives and shows how local interventions should contribute to global, landscape level objectives.

also in some cases there is no data comparability between Member States. This prevents any consistent aggregated evaluation from being built at the EU level. Also, most programs lack well-defined targets, which make it difficult to assess progress toward their goals.

Generally, the way the CMEF has been implemented varies considerably across Member States, with examples of very good high quality assessment reporting, versus cases where reporting contains gaps or contradictions (EEA, 2012).<sup>107</sup> Gaps in monitoring emerge mostly from inconsistent information reported by Member States to the Commission. For instance, with regard to water quality information, in some Member States ecological and chemical water status is unknown for more than 50 percent of water bodies, and monitoring networks were set up late and/or have methodological weaknesses that compromise the quality of the data collected and reported. There have been some good examples, however, of experimental networks linking agricultural practices with environmental quality indicators.

Monitoring and verification capabilities need to be improved across the whole EU. Member States should be required to provide data on all agri-environment indicators in a more timely, reliable and consistent manner. Also, to secure CAP objectives are actually achieved, the Commission must ensure that, at the very least, it has information that is capable of measuring the evolution of the pressures placed by agricultural practices on the environment and keeping track of the improvements achieved through AESs. Lessons could be drawn from the development and implementation of output-metric standards and certification schemes for biofuels, which can greatly inform progress in developing the methodological and institutional structures for operationalizing agri-environment indicators in agriculture in general.

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<sup>107</sup>EEA Report No 8/2012 European waters: assessment of status and pressures.

Private certification should not serve as substitute for public governance, however, as questions remain whether certification alone is capable of developing and applying comprehensive methodologies to measure the less tangible benefits of agriculture (e.g. food security, cultural heritage, and improved environmental conditions). Quantifying these benefits and landscape level impacts of certain land-use systems and practices has been one of the most challenging tasks for existing certification schemes and individual operators (particularly small farmers). This requires additional and long-term research on identifying the causal connection between sustainability practices and potential positive outcomes, which is both costly and time-consuming (Endres et al., 2015; and Dale et al., 2013). Experiences and lessons learned in the biofuels sector have the potential to shift the sustainability debate into all production landscapes and systems.

On the operationalization side, key lessons from biofuels certification suggest that field-testing assessments can be prohibitively expensive. Farm-level verification of selected operators represents the most expensive part of the monitoring system.<sup>108</sup> These on-spot checks are usually associated with high administration and monitoring costs that small farmers cannot usually afford. This partially explains why small-scale extensive farmers make up the minority of participating operators in *outcome-based* schemes (Schwarz & Morkvénas, 2012). Improving their access to these mechanisms should, therefore, be a policy priority for the EU and national governments.

While implementation of AESs and *cross-compliance* measures have partially succeeded

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<sup>108</sup>During the auditing process information gathered by randomly selected farmers is verified, and site visits are carried out to monitor certain management practices and verify, for example, the level of inputs applied, existing water discharge systems, soil conservation strategies, and etc.

in maintaining, and in some cases enhancing, environmental value in some areas of public good provision (Boatman et al., 2008), there is a need for more targeted and cost-effective measures, and also to learn from some of the more innovative, smaller-scale programs currently being implemented at the national, regional, and local levels (Cooper et al., 2009). If the argument behind subsidies following a market regulation approach to *multifunctionality* is to truly compensate farmers for the provision of public goods and services, actual outputs need to be measured, valued and monitored so that they can be paid for accurately.

Perhaps the greatest challenge CAP enforcement agencies will have to face moving forward is to address difficulties in measuring the less tangible aspects of *multifunctionality* (e.g. food security, rural development and other social benefits arising from agriculture), let alone the challenges in harmonizing quantitative models developed to measure other more tangible indicators of *multifunctionality* (e.g. carbon emissions, water quality and quantity, biodiversity loss, etc.). Because many of the environmental and socioeconomic externalities in question are diffuse in nature, or expensive to quantify and audit, and do not usually lend themselves to more standardized accounting frameworks, addressing these challenges will require the development of scientifically-verifiable, objective measurements.

Developing this institutional and analytical capability will allow Member States to audit and verify at the farm-level what is being paid for, as well as to check if outputs match landscape level aspirations (sustainability and *multifunctionality* goals). The emphasis on landscape level analysis and perspectives is important because it allows for measurement, monitoring and assessment of the relative sustainability associated with different components of heterogeneous agricultural systems, and for identifying the interactions among these com-

ponents and broader landscapes across scales and over time. In other words, a landscape-level approach is able to link agricultural management practices with past, current, and desired environmental and socioeconomic conditions (Dale et al., 2013). To effectively implement this analytical capacity, results must be monitored over time, and trends in important indicators must be analyzed. This can create opportunities for third-party certification within the scope of the CAP, although certification itself is yet to develop the appropriate institutional and analytical capacity for assessing prevailing conditions, monitoring trends, providing a warning signal of impending changes, and diagnosing causes of change.

### **5.3 IMPLEMENTATION OF CAP STANDARDS AT THE MEMBER STATE LEVEL: A UK CASE STUDY**

In addition to understanding the legal framework of CAP environmental standards, it is important to explore how these schemes and requirements are implemented at the Member State level so they actually can translate into environmental improvements at the farm and landscape level. As I have pointed in several parts of this work, many decisions are left to Member States, and several aspects of the CAP regulation can be tailored depending on national or regional priorities. This has led to various levels of policy outcomes across different Member States. In this subsection, I examine the UK as a case-study to explore how implementation of CAP environmental standards has occurred and the main challenges to achieving actual sustainability gains.

Similar to the EU as a whole, the farming sector in the UK is highly heterogeneous. Over the past 20 years, the UK has seen an increasing portion of its food being supplied

by imports. Domestic supply dropped from 75 percent in the 1990s to nearly 60 percent today (Defra, 2015a). In order to reverse this trend and sustain the UK food and farming sector, considerable investments have been made to modernize and increase productivity and competitiveness of British farmers. Today, some 12 percent of the workforce is employed in agriculture, 70 percent of the landscape is shaped by farming, and 27 percent of the agricultural land is considered of high nature value (HNV) land (EEA, 2009). Among the biggest issues faced by agriculture in the UK is pest control (both animal and plant diseases). Maintaining and improving soil health also has been a big challenge for the UK, which faces an 80 percent soil loss rate, especially driven by market pressure to increase productivity and low investments in soil conservation strategies.

In the UK, much like in the whole EU, farmers are heavily reliant on CAP subsidies. Figures reveal that, on average, livestock farmers in less favored areas (LFA) receive around 79 percent of their annual income from CAP subsidies. Cereal farmers have 37 percent of their annual income dependent on CAP transfers, and dairy farmers rely on CAP payments to receive 33 percent of their annual income (Defra, 2012). Although both small and large farmers agree on the importance of the CAP for maintaining the farming sector, they disagree on how the money should be spent.

While large farmers have put significant political effort in lobbying for the maintenance of CAP income support provided through direct payments, smaller farmers and environmental advocates, on the other hand, advocate for continuing *modulation* and more targeted environmental delivery. The main lobby groups influencing CAP negotiations in the UK are farmers (mostly represented by the National Farmers Union - NFU) and environmental

organizations (represented by the Royal Society for the Protection of Birds, RSPB).<sup>109</sup>

Defra (Department for Environment, Food and Rural Affairs) is the government agency in charge of implementing the CAP in the UK, with the support of Natural England, the Forestry Commissioner, and the Rural Payment Agency. The Farming Advice Service offers to British farmers advice on greening and *cross-compliance*.

Among the priorities set by the UK in the implementation of the latest CAP reform is the goal to meet the EU obligations while at the same time ensuring maximum flexibility for farmers to manage their business flexibly. Defra has been one of the major critics of the three crops requirement established under the crop diversification greening measure. It argues that farmers should be free to produce what consumers (the market) want to buy, not what has been dictated by the EU (Defra, 2015). It also has expressed its commitment to make greening more attractive to farmers, minimizing red tape and bureaucracy, and keeping practices as simple as possible. In other words, preserving what is positive and redirecting what interfere with farmers' capacity to respond to market demands (Defra, 2014).

In a related matter, Defra also has made it clear that it wants the EU to reconsider its regulations on pesticides and GMO permits to reflect what it believes has been validated as safe by science. Demands for more local-level decision making to give national authorities more power to consolidate or simplify existing rules in order to accommodate local challenges and priorities also have been one of Defra's claims.

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<sup>109</sup>The RSPB is a member of BirdLife International.

## *The Basic Payment Scheme (BPS) in the UK*

As previously mentioned, with the latest reform, all direct payments are administered by Member States through the new Basic Payment Scheme (BPS). In the UK, farmers with at least 5 hectares of eligible land qualify for BPS. These farmers will have to be tested under the new Active Farmer Test.<sup>110</sup> As the UK did not identify any land that could be classified as ‘naturally kept in a state suitable for cultivation and grazing’, only the first part of the active farmer test, related to business activities, will apply. Common land (e.g. crofting common grazing in Scotland)<sup>111</sup> also will be eligible for payments under the BPS, which opens opportunities for cooperation among farmers toward compliance with CAP environmental schemes.

Cross-compliance, in the UK, is the minimum requirement farmers must comply with in order to receive payments under the: (i) Basic Payment Scheme; (ii) Countryside Stewardship (AES); (iii) Entry Level Stewardship (ELS - AES); (iv) Higher Level Stewardship (HLS - AES); and, (v) Woodland Management Grant and Farm Woodland Premium. Like in any other Member State, *cross-compliance* is made up of Statutory Management Requirements (SMR) and Good Agricultural and Environmental Conditions (GAEC). Exemptions or derogations to *cross-compliance* may apply depending on the type and the size of a holding. Tables 6 and 7 offer a brief summary of all UK GAEC and SMR environmental standards and the practices that farmers are required to implement. In the UK, the Cross

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<sup>110</sup>See *supra* note 63 for more information on the Active Farmer Test.

<sup>111</sup>While the land involved is mostly owned by private land owners, the local crofting communities have secure legal rights of occupation and use. Due this unique tenure system under which crofters hold their land, crofting areas are home to some of the highest densities of rural population anywhere in the UK. This has, to some extent, ensured that crofting common grazings still cover a substantial part of the Highlands and Islands - 541,750 hectares or around 7 percent of Scotland’s total land area (Wightman et al., 2003).

Compliance Advice Programme, part of the Farm Advisory System, advises farmers about cross compliance.

Claimants are entirely responsible for compliance, even if the land is transferred to someone else in the same year a BPS application has been filled. Payments can be subject to reduction in the event of non-compliance of GAEC and SMR standards. For negligent cases, payments will normally be reduced by 3 percent (for each non-compliance). However, reductions can range from 1 to 5 percent depending on the extent, severity, reoccurrence and permanence of the non-compliance. Recurrent non-compliance is subject to higher penalties. For instance, if a penalty is applied for the second time, the payment reduction will be three times the size of the first penalty (even if that dates back to old SPS or rural development schemes). However, penalties cannot exceed 15 percent. After this, any more instances of non-compliance will be treated as intentional.

Intentional cases are normally subject to a 20 percent reduction, which can be reduced to 15 percent or increased up to 100 percent depending on the extent, severity, reoccurrence and permanence of the non-compliance. Ultimately, a claimant may be forbidden to apply for BPS if he/she continues to break the rules, the same applying to those who prevent government inspectors from verifying compliance.

In terms of the new greening rules, there will not be major changes in the UK. The amount of eligible agricultural land will determine what farmers need to do to meet the greening rules.

Eligible agricultural land is made up of all the: (i) arable land,<sup>112</sup> (ii) permanent grassland

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<sup>112</sup>*Arable land* consists of: (i) land cultivated for crop production, (ii) fallow land, and (iii) temporary grassland. Fallow land is land that has no crop production or grazing, meaning it cannot have permanent crops or permanent grasslands on it. Temporary grassland (including herbaceous forage) is land that has been in grass or other herbaceous forage for less than 5 years. This includes land that has been used for

**Table 6:** GAEC standards in the UK

<b>GAEC</b>	<b>Measures</b>
<b>GAEC 1:</b> Establishment of buffer strip along watercourses	Farmers must protect watercourses against pollution and run-off from agricultural sources by maintaining buffer strip
<b>GAEC 2:</b> Water abstraction	Farmers must have a permit from the Environment Agency (EA) to take more than 20 cubic meters (4,400 gallons) of water, from an inland or underground source for irrigation, in a single day
<b>GAEC 3:</b> Groundwater	Farmers must have a permit from the Environment Agency (EA) before they release (discharge) any substance that may harm or pollute groundwater, unless that discharge is an activity that is exempt
<b>GAEC 4:</b> Minimum soil cover	Farmers must take all reasonable steps to protect soil by having a minimum soil cover unless there is an agronomic justification for not doing so, or where establishing a cover would conflict with requirements under GAEC 5
<b>GAEC 5:</b> Minimum land management reflecting site specific conditions to limit erosion	Farmers must put measures in place to limit soil and bank-side erosion caused, for example, by: cropping practices and cropping structures, livestock management, including outdoor pigs and poultry, causing overgrazing and poaching, wind, vehicles, trailers and machinery
<b>GAEC 6:</b> Maintenance of soil organic matter	Farmers must not burn crop stubble except for plant health reasons, and shall not plough, cultivate or intensify species-rich and semi-natural habitats so as to keep organic matter and carbon levels in soils
<b>GAEC 7a:</b> Boundaries	Farmers must protect boundary features, such as hedgerows, stone walls, earth banks and stone banks because they are important landscape features (cutting, trimming and removal restrictions also apply, as well as restrictions to not cultivate or apply fertilizers in these areas)
<b>GAEC 7c:</b> Trees	Farmers may need to get a permit from the Forestry Commission if they want to cut down a tree. They must check if a tree has a Tree Preservation Order (TPO) and meet any conditions of the TPO. They also must follow the rules about when you can trim or cut trees.
<b>GAEC 7d:</b> Sites of Special Scientific Interest (SSSIs)	Farmers must not damage or destroy SSSIs, land which has been identified to have special flora, fauna, or geological or physiographical features

*Source:* Defra, 2015b.

**Table 7: SMR standards in the UK**

SMR	Measures
<b>SMR 1:</b> Reduce water pollution in NVZs	Farmers with land in nitrogen vulnerable zones must help to reduce pollution by using and storing fertilizer and manure carefully
<b>SMR 2:</b> Wild birds	Farmers must protect all wild birds, their eggs and nests. Extra rules apply if they have land classified as a Special Protection Area (SPA) <sup>a</sup>
<b>SMR 3:</b> Habitats and Species	Farmers must protect species of flora and fauna. Extra rules apply if they have land designated as a Special Area of Conservation (SAC)
<b>SMR 10:</b> Plant Protection Products	Farmers must follow strict controls over the use of pesticides as they can harm people, wildlife and the environment. Also they can only use plant protection products with a valid UK authorization or parallel trade permit, and follow UK guidelines for application of these products

*Source:* Defra, 2015b. <sup>a</sup>Special Protection Areas (SPA) are designated as a Sites of Special Scientific Interest (SSSI).

and (iii) permanent crops<sup>113</sup> in a farm.

Although permanent crops are not considered as arable land, they are still eligible for payments. The difference between them is that contrary to arable land, permanent crops do not need to follow *greening measures*. In fact, some of these permanent crops can qualify as EFAs (short rotation coppice). Some energy grasses, such as Miscanthus, also are recognized as permanent crops, which can be used to source bioenergy and provide ecosystem services. This creates opportunities to explore the ecological and energy value of these species in various ways and promote more integration of bioenergy systems into agriculture.

For instance, if efficiently cultivated, herbaceous grasses (temporary grassland) can pro-

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<sup>113</sup>*Permanent crops* are crops that occupy the land for 5 years or more (other than permanent grassland) and provide repeated harvests. These include short-rotation coppice, nursery crops and multi-annual crops. Short rotation coppice means areas planted with tree species that consist of woody, perennial crops, the rootstock or stools remaining in the ground after harvesting, with new shoots emerging in the following season. Examples of short rotation coppices include: poplar (*Populus* spp) and willow (*Salix* spp).

vide forage for ruminants, while also serving as sources of lignocellulosic feedstocks for the production of bioenergy. Herbaceous grasses also can serve as vegetation filters that intercept and capture nitrate running from fertilized cropland and animal manure, thereby reducing nitrate leaching into waterways (Skenhall et al, 2013). Certain permanent crops (short rotation coppice and Miscanthus) if cultivated in alleys and buffer strip in agricultural landscapes also can reduce erosion and nutrient loss, and sustain yields. Therefore, proper integration of such plant species into agricultural landscapes may reduce nitrate-related environmental problems and contribute to a more diversified landscape. Willow, for example, can tolerate relatively high concentrations of nitrate and be cultivated in plantations used for capturing nutrient runoff from intensively cultivated cropland and wastewater treatment plants (Aronsson, 2000; and Heaton et al., 2004). It also is an energy-intense bioenergy feedstocks that can be used for the production of bioenergy and a wide range of other renewable products.

In terms of implementation of EFA in the UK, landscape features and land-uses will be subject to weighting factors (Defra, 2014). While hedges and buffer strip are worth more than their actual measurements, catch/cover crops and nitrogen-fixing crops are worth less. This is because when setting the weighting factors to determine the eligibility of these features to qualify as EFA, the UK has set different weighting coefficients. For instance, 1 meter of length of hedges is equivalent to 10 square-meters of EFA, while 1 meter of length of buffer strip is worth 9 square-meters of EFA. On the other hand, 1 square-meter of catch crops/cover crops or nitrogen-fixing crops are worth 0.3 square-meters and 0.7 square-meter of EFA, respectively. Because some weighting factors were set as greater than 1, it will be possible for farmers in the UK to comply with the EFA rule even if they have less than 5 percent

of their eligible land under EFA. This criterion significantly weakens the implementation of EFA in the UK, and is likely to undermine its capacity to deliver environmental benefits.

In order to verify if farmers are properly following *cross-compliance* and *greening measures*, government inspectors visit a certain percentage of holdings each year. The verification system works in a way that in each scheme year, 1 percent of claimants of Basic Payment Scheme (BPS) are inspected. These visits can happen more than once a year, and they may not always be preceded by an advanced warning. If farmers are notified in advance, this may occur only less than 48 hours before the inspection (Defra, 2015b). Farmers who do not cooperate with inspectors can lose their payments.

### ***Agri-environment schemes in the UK***

When it comes to rural development policies, the UK has a long-term experience with implementation of agri-environment schemes (AES). Administered by Natural England, AESs have existed since 1987 and traditionally have paid particular attention to biodiversity conservation, specially targeted at birds protection. However, since 2005 the current Environmental Stewardship Program (ESP) has served a range of objectives which include the enhancement of habitats, mitigation of climate change, and promoting visits to the countryside (Natural England, 2009).

The ESP is a country wide AES in the UK which includes from more attainable to more complex measures, normally combining an Entry Level Stewardship (ELS) element with a Higher Level Stewardship (HLS) scheme. The scheme is mainly an practice-based AES where farmers have to fulfill a set of defined prescriptions. It includes also a range of ‘indicators

of success' (as a basis for bonus payments) associated with each habitat type of relevance to the scheme's objectives and joint character areas which guide the identification of priority locations for specific targets. Payments are made at a standard cost based flat-rate and for the purchase of capital items (Natural England, 2009). Similar to the BPS verification system, 1 percent of claimants of rural development funding are inspected every year, and also are subject to payment reductions in case of non-compliance.

Despite its long-term experience in implementing AES schemes, the UK's average Pillar 2 payment rate per hectare is the lowest in Europe (Council of the European Union, 2011). Also, high nature value farms receive significantly less total support per hectare (EEA, 2009). Also differences exist in terms of how Pillar 2 funding is allocated across countries. For example, in England 80 percent of the rural development budget is allocated to AES (EEB, 2012). In Scotland, on the other hand, there has been more priority placed on supporting the Less Favorable Areas Support Scheme (LFASS) as an additional income support for farmers. AESs still receive 50 percent of Pillar 2 budget in Scotland (RSPB, 2011).

The large majority of UK farmers have maintained CAP support without having to go beyond cross compliance, whether because they do not access AESs or only access the (entry) low level of such schemes. Recent analysis has suggested that the widespread use of low-intensity AES in the UK has failed to raise the environmental baseline set under *cross-compliance*, and delivered moderate biodiversity gains (Whittingham, 2011; and Baulcombe et al., 2009). A recent survey by BirdLife International concluded that although UK's AESs have considerable potential to support farmland biodiversity, they have been undermined by an insufficient allocation of resources and some poorly designed schemes (Boccaccio et al.

2009).

Others, however, suggest some AESs have been successful in delivering benefits to biodiversity, particularly for farmland plants and birds, species-rich grasslands, hedgerows, moorland and lowland heath, and some type of wetland (Boatman et al., 2008). There has been success, for example, with schemes targeted at specific species. In the UK, implementation of a special agri-environment project was able to increase the national breeding population of circl buntings from 118 pairs in 1989 to 862 in 2009, preventing the species from being lost from the UK altogether. This has been achieved through a partnership between government agencies, non-governmental organizations and farmers, and has been seen as a successful case of targeted implementation of AES. More importantly, participants were able to accommodate the measures within their existing farm practices to deliver effective conservation results (Evans et al. 2002). Along with practicality, other factors leading to effective implementation were attractive financial incentives, and the availability of advisers with specific conservation knowledge. The projects benefited also from their ability to target resources to relatively small areas. There is potential to apply similar methodologies to other farmland bird species, as many other populations such as the skylark, corn bunting, grey partridge and turtle dove continue to be threatened.

Despite relative success in biodiversity conservation, UK AESs have shown little contribution to protect water and soil, although these have only recently become explicit objectives of AES projects. This gap calls for greater targeting and tailoring of these schemes to other environmental problems in agriculture (Baulcombe et al., 2009). In order to prioritize land for delivering multiple functions, the implementation of AES may be supported by landscape

planning strategies to target land use to, in selected places, deliver public goods.

Because most entry-level schemes are likely to be diverted to meet the new *greening measures*, UK AESs are expected to become much more focused on Higher Level Stewardship agreements (HLS), which have the potential to deliver improved environmental outcomes. In a period of scarce rural development funding, refocusing AES budget to more targeted schemes may offer a opportunities for the development of more environmentally effective and cost-efficient schemes.

## Chapter 6

# CONCLUSION AND POLICY RECOMMENDATION

In today's policy context, agriculture is expected to produce abundant and affordable food, while at the same time taking into account the environment, maintaining rural landscapes, and protecting the welfare of animals and the health of consumers. In Europe, the Common Agricultural Policy has been reformed to address these issues, with promises to promote a fairer distribution of agricultural funds among farmers, and most importantly to make the CAP more environmentally friendly.

Although some environmental issues arising from agriculture are addressed in EU regulation, tying CAP subsidies to environmental and rural development objectives offers the most promising opportunity to accelerate a transition toward more sustainable and resource-efficient farming systems. Driven by the *multifunctionality* paradigm, past CAP reforms have seen the environment and rural development become permanent issues of debate, pushing for further integration of environmental and socioeconomic standards into CAP supporting schemes.

Currently, environmental objectives are delivered through the implementation of three

major instruments: *cross-compliance*, *greening measures*, and *Agri-environment Schemes (AES)*. While *cross-compliance* and *greening measures* have the advantage of being applied to all farmers accessing subsidies across the whole EU, AESs continue to be implemented on a voluntary basis, with wide variation on how Member States design and adjust these schemes to address local priorities and conditions.

Despite several attempts to shift CAP subsidies from the initial trade-distorting price support schemes to be provided in the form of decoupled direct payments, past reforms have not resulted in overall reduction of EU expenditure on agricultural policy. In the contrary, the CAP continues to receive the largest share (40 percent) of the EU budget, and to follow similar patterns of distribution within pillars. As always, European farmers remain heavily dependent on CAP support systems as a source of income, with direct payments maintaining the lion's share of the CAP budget. Consequently, farmers have made a tremendous effort to maintain the CAP supporting systems in place and to ensure a large portion of its budget continues to fund direct payments with minimum environmental standards attached. Environmental organizations, on the other hand, have worked intensively to ensure that subsidies are shifted from payment entitlements toward sustaining more targeted agri-environment payments for public goods, which should be implemented in a transparent and accountable way.

My research findings point to an apparent failure of the EU in pursuing further greening of the CAP. I find that environmental and socioeconomic objectives only have been partially integrated into the CAP supporting schemes, either because of the limited scope of the objectives or the unsuccessful implementation of standards. Several standards remain

to be added to the list of CAP environmental and socioeconomic standards. In addition, implementation of *cross-compliance*, *greening measures*, and *agri-environment schemes* have been tailored in various ways to adapt to Member States' priorities and conditions, often in detriment of EU sustainability goals. The large majority of the CAP budget continues to favor direct payments with minimum environmental and socioeconomic requirements. At the same time, entry-level, poorly designed and under-financed AESs fail to deliver the expected environmental outcomes beyond those set under *cross-compliance*. This serves as evidence that CAP payments have only been partially explored as a way to promote environmental and rural development objectives, and to foster agricultural *multifunctionality*.

If subsidies are supposed to truly compensate the non-commodity outputs of agriculture, CAP supporting schemes will have to shift toward broader implementation of outcome-based payments. There is opportunity to learn from pilot outcome-based programs implemented in some Member States (e.g. Germany), which can and should influence the adoption of similar systems in other Member States. Also, experiences and lessons learned in the design and implementation of outcome-based standards in the biofuels sector can inform initiatives emerging from other agricultural sectors in the EU. A successful operationalization of such outcome-based payments, however, requires efforts to develop the appropriate institutional and analytical capacity to measure, monitor, and evaluate results, as well as to check if outcomes match targeted sustainability aspirations. Investments in long-term research to develop and test quantitative measurement tools also will be key to allow the establishment of causal links between outcomes and particular practices across space and over time.

Improving monitoring and enforcement capabilities must be a priority to the EU and all

Member States. This requires further developing and applying operational agri-environment indicators to assess trends, improving data collection and availability to support measurements, and further developing mapping capabilities to facilitate monitoring. Besides facilitating the verification of compliance, these instruments can inform adaptive management, and help Member States and the EU to set priorities for the design of future policies to ensure continuous improvement. Lastly, strengthening the national Farm Advisory Systems (FAS) is crucial to ensure that farmers are receiving the appropriate assistance and training to understand and implement standards. Moreover, farmer's participation in the design and implementation of measures and indicators should be encouraged in order to ensure that they are acceptable and identifiable to farmers.

Up to this date, EU and Member States' policy efforts to address complex ecosystem challenges emerging from the unsustainable use of natural resources have remained to a considerable degree fragmented. This reality has made it even more challenging for Europe to revert current levels of environmental degradation across farm fences and Member States' boundaries. There is a need for a fundamental re-think on the way agricultural policies are designed and implemented to address sustainability issues as wide as climate change, water pollution, biodiversity, and soils. To fully understand and deliver the potentials of *multi-functionality*, fragmented policies and funding mechanisms will have to be better integrated.

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