



The 2013 CAP Reform

EU Agriculture and Climate Change

Mickael Djawara

Lokaverkefni til MA-gráðu í Evrópufræði

Félagsvísindasvið

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Ritgerð þessi er lokaverkefni til MA-gráðu í Evrópufræði og er óheimilt að afrita ritgerðina á nokkurn hátt nema með leyfi rétthafa.

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Abstract

Climate change has been identified as a major challenge for agriculture within the EU. The rise of temperature across the EU aggravates the threat that the climate will pose to agricultural systems and will also lead farmers to adapt their farming techniques to cope with these new climatic conditions. Weather hazards will be more frequent in every region, varying from higher risks of floods and precipitation in Central and Eastern Europe to the rise of heat waves and droughts in the southern region. One of the goals of the 2013 Common Agricultural Policy reform was to help farmers address the climate change challenge. The Commission proposed three measures (crop diversification, maintaining permanent grassland, ecological focus areas) that were destined to reduce greenhouse gases emissions from agricultural activity. The reform was met with scepticism from all the stakeholders in the agricultural sector, one side arguing that it would put production and food safety in danger and the other side opposing the reform because the environmental benefits would be minimum. It also highlighted the dominating role of the Council in the CAP decision making process against the Commission.

Preface

This thesis is the final project for a Master's of Art degree in European Studies at the University of Iceland. The field of European integration is immense, and it is not always easy to pick a subject when the time comes to write a thesis. I carefully contemplated which topic to focus my research on and eventually reached a decision. After much deliberation, I thought it would be best if I combined my personal interest and curiosity.

It has been a few years now that I have been particularly interested in climate change issues and the ongoing debates within the scientific community which is unable, at the time of writing, to agree about this pressing matter. Climate change is significant on a political level due to the necessity for European countries to find a common answer to climatic problems; individual policies on climate change would seem inefficient to tackle such a global issue. Climate change is an especially threatening prospect when it comes to agriculture. Although I was not very knowledgeable about this sector prior to beginning this project, I am delighted to have discovered such a fascinating and complex field.

The Common Agricultural Policy is a legislation that definitely has its own characteristics in the European institutional framework. The reform was a great challenge for the Commission due to the many stakeholders that are involved in agriculture. Since lobbying within European institutions is a common practice, it is therefore unlikely that all parties will be satisfied with the final result.

To conclude, I would like to give special thanks to my thesis supervisor Professor Baldur Þórhallsson for assisting me in every step of this project. His time and advice have been of great help to me.

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1 Introduction

Since the creation of the European Union, previously called the European Economic Community, one of the oldest integrated policy areas is agriculture. In the wake of World War II, Europe was facing the risk of food shortage and the rebirth of its agriculture was a necessary cause. The Treaty of Rome in 1957, the founding episode of the European Community, laid the ground for the creation of the Common Agricultural Policy (CAP) in 1962, with the ambition to provide support for farmers. The CAP has been subject to many heated debates among member states through the decades of European integration. For example, one can cite France's President De Gaulle and the "empty chair" political strategy to secure the unanimous vote and the right of veto which would apply to the CAP, or the intense negotiations that occur among member states every time the CAP budget is discussed. Today, agriculture faces some challenges that were not among the priorities at the time of its creation, and new responses are required to help farmers overcome them. There is solid evidence that climate change is occurring and it will affect the whole EU, and in particular farmers. Many regions will face a decrease in average annual and seasonal rainfall, whilst heat waves, droughts, storms and floods will be increasingly frequent across the EU. Farmers can be adversely affected by changing climatic conditions, and they need to adapt their farming methods and systems to cope with climate change. With the 2013 CAP reform, the European Commission planned to create the legislative framework to ensure better action from farmers on the front of environmental benefits.

The aim of this thesis is to analyse how the European Commission has succeeded or failed in taking into account the issue of climate change in its reform proposal and its subsequent response. The research question the study intends to ask could be formulated as follows: can the CAP help mitigating climate change effects on EU agriculture? Climate change has been studied through the years for various reasons. Its effects have been modelled by scientists in order to give us some understanding of the phenomenon, although there are disagreements within the scientific community. The scope of this research paper is to analyze the chances of success for the CAP to mitigate climate change effects through political means. The focus will be put on the greening measures proposed by the Commission and how stakeholders and political actors responded to them. Financial mechanisms that regulate the CAP will be discussed to the minimum, if not left aside, as they would have their place in a more focused research paper on the functioning of the CAP.

The opening chapter of the thesis will be dedicated to the theoretical framework used in the study. Theories borrowed from the field of European integration are appropriate surrogates to explain the functioning of the CAP and the EU environmental legislation, in this case neofunctionalism and liberal intergovernmentalism will be used. Neofunctionalism was developed by Ernst Haas in his book “*Uniting of Europe*” (1958), who built on the works of David Mitrany—the founder of functionalism—and Jean Monnet and his ideas on integration. Neofunctionalism’s main features are the concept of spill-over and the autonomous role of supranational institutions. This theory will help building the case that environmental legislation is an integrative force which, with the help of strong supranational institutions that rise above national pressures and interests, can deliver positive environmental results. Liberal intergovernmentalism (LI) was developed by Andrew Moravcsik in 1993 and built upon the works of Stanley Hoffman (founder of the Intergovernmentalist school), himself a critique of neofunctionalism. Moravcsik argues that states are the key actors in the process of integration and the EU can be studied by treating states as the critical actor in the context of anarchy (Moravcsik & Schimmelfenning, 2009 : 68). LI’s focus on states is relevant to understanding the dynamics of intergovernmental negotiations, in particular the context of the CAP where member states must bargain their preferences in order to get the best outcome possible from these negotiations.

The second chapter of this research paper will be dedicated to answering the hypothesis that climate change will affect EU agriculture. It is necessary to understand the importance of agriculture in various regions within the EU where it is sometimes the only means of subsistence for local populations. Therefore finding suitable solutions for dealing with changes in farming methods is a necessity. Agriculture has changed through the years; from local farming communities whose main purpose was to be food sufficient, it has developed in some regions into an extensive farming culture dedicated to exports in countries where the land is not suitable for local farming. This chapter will aim to explain what threats climate change poses to the future of agriculture. However, the scientific community is divided between a majority acknowledging that climate change is a serious anthropogenic threat which demands a more environmentally friendly behavior from the global population, and those who argue that climate change is a natural phenomenon and therefore cause for concern is minimal. Models have been created in order to understand and predict climate change but so far scientists have failed to agree on a unique method of analysis. This stresses the controversial nature of the issue. Rising temperatures will have different consequences according to which part of the world one lives. Experts predict that southern regions, which

have high sun exposure, will see an increase in droughts and a reduced cropping season in the coming years, whereas in the northern regions, with cooler temperatures, there will be far more rainfall potentially leading to an increased cropping season(Nelson, et al., 2009).As a result, disparities between the North and South will inevitably increase, which in turn may create political tensions within the EU.

The third chapter will focus on the legislative aspects of the research, and will aim to answer the hypothesis that the agriculture sector must be backed by efficient EU legislations to adapt to climate change. Are European decision makers addressing the problem efficiently? A closer look at EU policies will help understanding how decisions are made and taken. A historical background of the Common Agricultural Policy since its birth back in the 1960's will prove to be useful in catching the importance this policy has within the European setting, and why particular member states heavily rely on its implementation. Climate change was not discussed in the CAP when it was created; therefore, it is necessary to analyze what adjustments have been made to get a more environmentally friendly agricultural sector in the EU. With the support of other items of the EU environmental legislation, farmers are more likely to adapt their farming techniques and to reach the expected environmental results.

The final chapter will answer the hypothesis that the CAP will not sufficiently help agriculture in mitigating the effects of climate change. This section will give voice to the main stakeholders in the CAP, in particular the pressure groups. A pressure group is an organization that works to influence public policies in the interest of a particular cause, and lobbying can be understood as an action influencing policy makers in order to obtain policies that will serve the organization's cause. One can distinguish on the one side the farmers' and the agribusiness groups whose main goals are to protect interests related to production and competitiveness of agricultural outputs; and on the other side the environmental groups and organic farmer groups who are dedicated to protecting the interests that involve the environment and sustainable farming practices. This chapter will put into light the unbalanced fight between these camps, as the former group is more equipped with resources to spend and influence policies than the latter. These groups' opinion on the CAP reform will serve as an indicator of the chances of success of said policy. The balance of power, which is more favorable to the farmers, within the EU institution will prove useful to answer the research question.

2 Theoretical background

Being among the first policies of the European Community, the CAP has played a great role in promoting regional integration. International Relations scholars have from the start of the Community proposed theories of regional integration in order to explain the processes and outcomes of European integration. Several schools of thought have emerged but the debates have been dominated by two bodies of theory: neofunctionalism and liberal intergovernmentalism. Neofunctionalism was a popular theory in the 1960s developed by Ernst Haas in his book *“Uniting of Europe”* (1958), whose roots can be traced back to David Mitrany’s functionalist theory and to the works of Jean Monnet. Neofunctionalism’s main features are the concept of spill-over and the autonomous role of supranational institutions. However, the 1970s have proven to be difficult time for neofunctionalist thinkers as they failed to explain the stalling of the European integration process, a failure that led Haas to call his theory obsolete (Nieman & Schmitter, 2009: 45). But the restart of the integration process in the 1980s has reignited interest in the theory. Liberal intergovernmentalism, developed by Andrew Moravcsik in 1993, was built upon the works of Stanley Hoffman (founder of the Intergovernmentalist school) who was himself a critique of neofunctionalism. Moravcsik argues that states are the key actors in the process of integration and the EU can be studied by treating states as the critical actor in the context of anarchy (Moravcsik & Schimmelfenning, 2009: 68). LI was a dominant theory in the 1990s.

Other international relation scholars have attempted to explain European integration, such as social constructivists, or new institutionalists. Although they have been catalogued as approaches rather than theories per se, these schools of thoughts have never enjoyed the success in the integration debate that LI and neofunctionalism have achieved. Both theories bring forward elements to understand how the EU intends to make its agricultural sector develop a more environmental friendly attitude in regards to its objectives to reduce greenhouse gas emissions by 2020. Neofunctionalism will be deployed to study the interaction of environmental legislations with agriculture and the CAP. The goals of greening the CAP are steps that cannot be dissociated with ongoing and future policies that aim to combat climate change, otherwise having an agricultural legislation that tackles environment in one way, and dedicated green policies that sets environmental requirements in another way, will very likely be counterproductive. LI will be used to analyse the decision making process involved in the CAP, such as the creation of national preferences and bargaining. Pressures from non-political groups, in particular farmers’ group, on governments are the basis for the

building of preferences, and these preferences are very unlikely to differ from farmers' expectations. Bargaining among member states becomes inevitable, which raises the case of the importance of intergovernmental decision making in the EU. The following chapter will develop in more details these theories which will provide a framework for this research paper.

2.1 Neofunctionalism

The core of the theory is the concept of spill-over. Haas (1958: 383) argues that the integration in one sector leads to technical pressures that push states to integrate other sectors (Nieman & Schmitter, 2009: 45). The idea is that some sectors are so interdependent that it is not possible to isolate them from the rest. Therefore, the integration at the regional level in one sector can only work if it is combined with the regional integration of other sectors, as problems that arise from the starting sector can be solved by integration with other sectors. For example, the integration in the coal and steel sectors in the early days of the European project would not have been viable if states didn't integrate with other related fields such as transport, thus ensuring a smooth transition of goods. As European integration started via economic purposes, functional spill-over was the term coined in the 1970's to explain the process of integration through an economic rationale (Nieman & Schmitter, 2009: 45). Haas and Lindberg also considered that national elites, both economic and political, play a significant role in the integration process. This is particularly pertinent when elites understand that some issues cannot be solved at the domestic level, therefore gradually shifting their expectations and political activities to a new European centre (Nieman & Schmitter, 2009: 45). Non-governmental groups such as political parties, business and professional associations, trade unions and other interest groups can also be pushing for integration, particularly if they see their interests can be better served at the regional level. Lindberg went further in the analysis by focusing on the role of governmental elites and the socialization processes. He drew attention to the rising number of working groups in the European institutions bringing together thousands of officials from every member state, together with Commission officials into a large bureaucratic system, as emphasized by the creation of the Committee of Permanent Representatives. He argued that the same level of socialisation would appear during Council meetings and therefore the decision making process would shift from a traditional national strategic bargaining to a supranational problem-solving process in which participants would refrain from vetoing proposals and instead seek agreements by

compromise for a greater common interest, a process also known as informal co-optation (Nieman & Schmitter, 2009: 50). Another important aspect of the neofunctionalist theory is the role played by the central institutions, especially the Commission, in the promotion of integration. Haas argued that intergovernmental decision making was characterized by the lowest common denominator negotiations and in such settings the outcomes were in line with the position of the least cooperative partner, whereas in supranational systems parties would seek to split differences and look for upgrading common interests (Nieman & Schmitter, 2009: 50). Haas believed the Commission's role as a mediator among parties would serve the integration process. Lindberg focused on the Commission's cultivation of ties with national elites and interest groups. Because it occupies a central role in the European setting, it is in a privileged position to influence contacts between member states or interests groups, and therefore helps develop European integration. This integrative role of the Commission is called cultivated spill over (Nieman & Schmitter, 2009: 50).

Neofunctionalism has received its fair share of criticism from a range of intergovernmentalist scholars on different accounts. Moravcsik has questioned "the assertion that spillover is inevitable and its seemingly exclusive reliance on economic determinism" (Moravcsik, 1993: 475ff; Nieman & Schmitter, 2009: 51). Judging Haas' notion of the dramatic political actor (Haas, 1968: preface) or Lindberg's claim that spillover cannot occur if member states do not share the will, demonstrates the lack of a clear link with the core of the theory. Critics of neofunctionalism consider that the conditions for spillover to occur are not specified in a comprehensive manner by its authors (Lindberg, 1963: 11; Nieman & Schmitter, 2009: 52). Other theorists, in particular Hoffmann (1995: 75-84), have criticised neofunctionalism for overlooking the impact sovereignty consciousness and nationalism has as a barrier to integration. Episodes of the European integration history such as Charles De Gaulle's empty chair strategy or the British policies under Margaret Thatcher are a strong support for these claims. And more economically minded critics add that spillover is likely to occur only under favourable economic circumstances. During the 1950s and 1960s the Community enjoyed economic growth but the worsening of the economic climate in the 1970s has led to a stalling of the integration process and a resurgence of intergovernmental decision making at the expense of the Community method (Webb, 1983:21; Nieman & Schmitter, 2009: 52). A number of authors, such as Hoffmann (1995) Webb (1983) and George (1981) have noticed the failure of neofunctionalism to take into account the broader international context and its effects on the European integration. Hoffmann argued that external factors are a disintegrative force and diverse responses by member states to its

pressure can lead to divisions or ruptures (Hoffmann 1995: 84; Nieman & Schmitter, 2009: 52). Haas seemed well aware of neofunctionalism neglecting the wider international context and saw it as a shortcoming of his theory (Haas, 1968: preface). Neofunctionalists have been strongly criticised for their lack of attention to the domestic political processes and structures. On the one hand they have been criticised for underestimating the role of national decision makers as only “economic incrementalists” and “welfare seekers”, and on the other hand for overestimating the role of interest group in influencing policies and the pressure they can put on governments (Nieman & Schmitter, 2009: 53).

2.2 *Liberal Intergovernmentalism*

Liberal Intergovernmentalism rests on two primary assumptions. First, it considers the states as actors. They achieve their goals through intergovernmental negotiation and bargaining instead of relying on a supranational institution that makes and enforces political decisions. The European Community best serves as an international regime for policy coordination (Moravcsik 1993: 480; Moravcsik & Schimmelfenning, 2009: 68). The second assumption is that states are rational. When several options are envisaged, states chose the one that will maximize their gains. LI argues that collective outcomes can be explained as the result of aggregated individual actions in the efficient pursuit of these preferences, and that cooperation or the creation of international institutions are the result of interdependent rationale state choices and intergovernmental negotiations (Moravcsik & Schimmelfenning, 2009: 68). These assumptions have been studied in three theories: national preferences, state bargaining, and institutionalisation.

LI sees the state as a unitary actor with the assumption that domestic political bargaining, representation, and diplomacy generate a constant preference function; according to liberal theories of international relations “the foreign policy goals of national governments vary in response to shifting pressure from domestic social groups, whose preferences are aggregated through political institutions”(Moravcsik 1993: 483; Moravcsik & Schimmelfenning, 2009: 69). LI argues that state preferences are driven by issue specific preferences, and in the case of the EU preference of national government for integration, were highly driven by economic interests. According to Moravcsik, European integration after WWII was made possible due to shift from north-south inter-industry trade and investments to north-north intra-industry trade and investments, and governments pursued integration as

“a mean to secure commercial advantages for producer groups, subject to regulatory and budgetary constraints and the macroeconomic preferences of ruling governmental coalitions”(Moravcsik 1998:3, 38; Moravcsik & Schimmelfenning, 2009: 70). To explain the outcomes of international negotiations among states whose national preferences are very unlikely to converge, LI has adopted a theory of bargaining. States must cooperate for mutual benefits, but at the same time they have to decide how the mutual gains will be distributed among them. Bargaining theory argues that “the outcome of international negotiations depends on the relative bargaining power of the actors” (Moravcsik & Schimmelfenning, 2009: 71). In the context of the EU, information on the preferences of actors and knowledge of the institutions play a vital role in bargaining. For instance, actors who are the least in need of a specific agreement are in a better position to force other parties to make concessions, and those who have a better knowledge of other actors’ preferences and the working of the institutions can influence the outcomes of the negotiations to their benefits.

Once an agreement has been reached, governments set up international institutions in order to cope with any situations that could derail such agreement. Borrowed from neoliberal institutionalism theorists, LI argues that international institutions are often a necessity for durable cooperation (Moravcsik & Schimmelfenning, 2009: 72). States establish rules for the distribution of gains, and institutions serve to monitor their behaviour and to sanction for non-compliance. Moravcsik defines as *pooling* of sovereignty when governments take decisions in an issue area using decision methods other than unanimity; and sovereignty is *delegated* when supranational institutions can take decisions which cannot be overturned by states’ vote or a veto (Moravcsik, 1998: 67). Transferring sovereignty to supranational institutions allows governments to effectively remove issues regarding the potential influence of domestic politics and decentralized intergovernmental control, which could lead to pressures for not complying if the costs for powerful domestic actors are too high (Moravcsik 1998: 9, 73)(Moravcsik & Schimmelfenning, 2009: 72).

However, LI has not been exempt from criticism from other schools of thought in international relations. The main critiques have stemmed from rational choice institutionalists, who argue that LI cannot explain everyday decision-making and therefore it is limited to only a small part of the EU policy-making in which institutions do not play a significant role, as such they believe their approach is more appropriate since they take into account a broader institutional framework (Peterson 1995; Pollack 2005; Moravcsik & Schimmelfenning, 2009: 73). Historical institutionalists consider that LI focuses mainly on intergovernmental decision-

making where treaties are amended; leaving aside many unintended or undesired consequences that could arise from treaty amendment. They claim that states can see their national preferences shifting and therefore make all prior bargaining inconvenient; and that supranational institutions may act to enhance their own autonomy and influence within the European framework, thus constraining governments in unexpected ways (Sandholtz & Stone Sweet 1998: 26; Moravcsik & Schimmelfenning, 2009: 75). Their best example lies in the role of the European Court of Justice which, during the 1960s and 1970s, increased its power and autonomy by interpreting its competences in an integrationist fashion that was neither anticipated nor wanted at first by governments. Leon Lindberg argued that some elements of the LI theory could be incorporated to neofunctionalism, in particular Moravcsik's analysis of how states participation at European level allows them to put themselves into relative autonomy in relation to their national constituencies, and the possibility to apply this to the Commission during the process of national interest formation (Lindberg, 1994: 83; Rosamond, 2000: 145). Lindberg stresses the importance of supranational institutions and believes the Commission can take an advantage of the diversity of national preferences among member states. Neo-institutionalist scholar Daniel Wincott strongly criticized Moravcsik's theory on the ground that LI should be thought as an approach rather than a theory, due to the fact that Moravcsik has not laid out the circumstances in which it could be empirically refuted (Wincott, 1995b; Rosamond, 2000: 146). Therefore, it makes it extremely difficult to analyse the intergovernmental biases of LI as working assumptions.

The CAP is, almost by excellence, legislation where intergovernmental negotiation prevails. From its birth it was established on the basis of strong national preferences by French leaders and pressure from the national farmers' group, which were decisive in shaping these preferences. In the 1950s farming employed 25% of the French population, therefore making agriculture a sector of national interest. Intergovernmental decision making is characterized by bargaining between member states, in which the outcomes might not satisfy all the parties. Bargaining can explain the success or the failure of the greening measures in the CAP reform, as member states do not enter negotiations with the same level of interest. Some member states with little interest in the CAP may have welcomed the Commission's proposal when it came to negotiate a common position for the Trilogue discussions, but those with a lot at stake would force adoption of a resolution that would suit their needs and the threat of veto decisions give more weight to their tactics. Where neofunctionalism sees the supranational institutions as being entrepreneurial, LI considers them to be in place to serve the needs of the member states. The CAP legislative set up was a clear example of the

dominance of the member states over the Commission since they had the power to reject proposals, but the new powers from the EP provide a new balance in the institutional framework and therefore a test for LI.

Neofunctionalism is best suited to explain the need for integration of environmental legislations. The function of spillover and the role of the Commission are key elements. Agriculture is expected to play a role in mitigating the effects of climate change and that would be possible through good agricultural practices that would keep soil healthy and allow it to capture greenhouse gases. However, the CAP in the past has encouraged intensive farming and, greening measures are linked to financial incentives and are not compulsory. Integration in soil protection, which is in the pipeline of the Commission, might be inevitable if agriculture is to reach its targets (Agriculture and Food, 2012).

3 Climate change and agriculture

The term climate change is generally used to express the anthropogenic influence on climate. The main threat of this influence is the production of greenhouse gases (GHGs) which are responsible for the greenhouse gas effect. GHGs are gases that can absorb and emit infrared radiations. The primary GHGs in the Earth's atmosphere are the water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) (Baede, Van der Linden, & Verbruggen, 2007). The greenhouse gas effect is the trapping and build-up of heat in the atmosphere near the Earth's surface. Some of the heat that flows back toward space from the Earth's surface is absorbed by the GHGs in the atmosphere and radiated back to the Earth's surface; if the atmospheric concentrations of these GHGs rise, the average temperature of the lower atmosphere will gradually increase (United States Environmental Protection Agency, 2012).

In this chapter, we will address the hypothesis that climate change will affect EU agriculture. Through reports released by the Intergovernmental Panel on Climate Change, research on climate change has been well documented, and there are evidence agriculture will be affected therefore making necessary for farmers to adapt to new climatic conditions. Agriculture needs to play its fair share in the fight against climate change as well. As an emitter of GHGs, it produces mainly nitrous oxide (N₂O) from fertilizers, and methane (CH₄) from the intestinal fermentation of ruminant animals. The study will focus on the specific risks agriculture will need to tackle, in particular on the front of natural resources: water availability will be among the major source of concern for farmers, as well as the increase in the frequency of weather hazards. Another source of concerns for farmers will be the geographic distribution across the EU of these climatic effects, as each region will face specific threats to deal with. This chapter will explore as well how agriculture can play a role in reducing GHG emissions with adequate farming techniques. Focus on land management will provide solutions to effectively complete that task.

3.1 The Intergovernmental Panel on Climate Change

The Intergovernmental Panel on Climate Change (IPCC) is currently the leading international body dealing with climate change. It was created in 1988 by the United Nations Environment

Program and the World Meteorological Organisation in order to provide a scientific and independent view on the current knowledge of climate change and its potential environmental and socioeconomic impacts. The IPCC is a scientific body that works under the supervision of the United Nations (UN). Its main task is to review and assess the most recent scientific works that are related and that contribute to a better understanding of climate change impacts (Intergovernmental Panel on Climate Change, 2013). The IPCC is an intergovernmental body which is open to all member states of the UN. There are currently 195 members, which all participate in the works of the organisation. Thousands of scientists and other experts work with IPCC on a voluntary basis to write and review reports which are then reviewed by representatives from all the member governments. The IPCC does not carry out research nor does it monitor data related climate change. However, by endorsing the IPCC reports, governments acknowledge the scientific authority of their content (Intergovernmental Panel on Climate Change, 2013). The current knowledge regarding climate change has been well documented in the latest *IPCC Fourth Assessment Report* issued in 2007.

Eleven years between 1995 and 2006 ranked among the twelve warmest years since the start of instrumental recordings of global surface temperature in 1850. The temperature increase is widespread over the globe. It is greater at the higher northern latitudes, and land regions have warmed faster than oceans. The sea level is affected by rising temperature. The global average sea level has risen at an average of 1.8mm per year since 1961 and 3.1mm per year since 1993 with melting glaciers and ice caps, and the polar ice sheets contributing to this rise. Observed decreases in ice extent and snow can be attributed to warming. According to satellite data since 1978, the annual average Arctic sea ice extent has been reduced by 2.7% per decade, particularly during summer seasons (7.4%). Mountain glacier and snow cover have also declined in both hemispheres.

Figure 1 Changes in surface temperature, sea level and Northern hemisphere snow cover (Intergovernmental Panel on Climate Change, 2007)

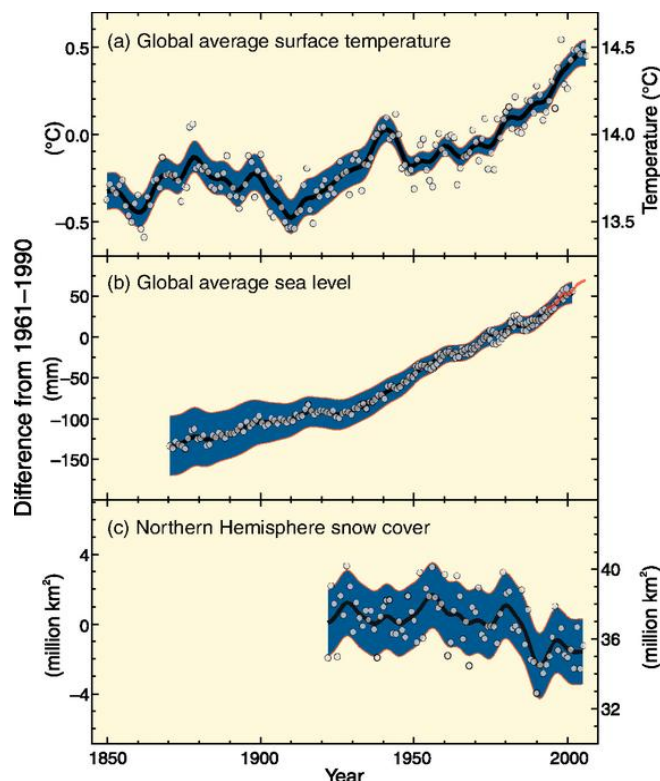


Figure 1. Observed changes in (a) global average surface temperature; (b) global average sea level from tide gauge (blue) and satellite (red) data; (c) Northern Hemisphere snow cover for March-April. All differences are relative to corresponding averages for the period 1961-1990. Smoothed curves represent decadal averaged values while circles show yearly values. The shaded areas are the uncertainty intervals estimated from a comprehensive analysis of known uncertainties (a and b) and from the time series (c).

The main reason for the change in climate temperature, presented in the report, is the rise of global greenhouse gas emissions due to human activity since pre-industrial times, with an increase of 70% between 1970 and 2004 (Intergovernmental Panel on Climate Change, 2007). Observations have shown that since the mid-20th century, the increase in global average temperatures seems to be due to the observed increase in GHG concentrations and that each continent, except Antarctica, has been affected (Intergovernmental Panel on Climate Change, 2007). There is much evidence and strong agreement that global GHG emissions will continue to grow during the forthcoming decades under current climate change mitigation policies and sustainable development practices; and that if GHG emissions remain or increase above current rates, it would cause further warming and provoke an array of changes in the global climate system during the 21st century, potentially stronger than has been observed in the 20th century (Intergovernmental Panel on Climate Change, 2007).

3.2 Overview of greenhouse gas emissions in the EU

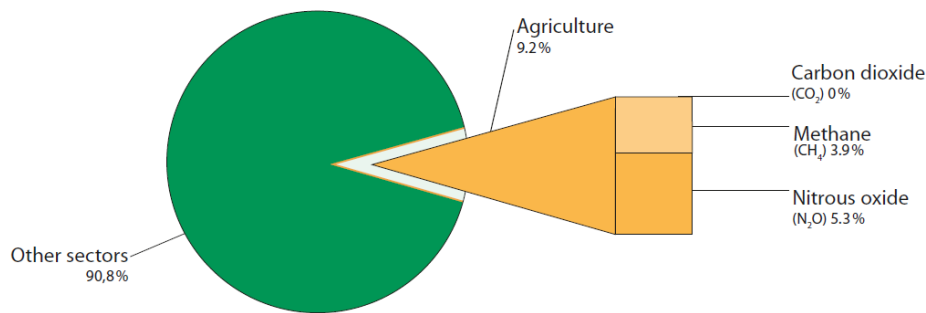
When it comes to climate change, agriculture is both a cause and a victim. It needs to address the challenge to reduce its GHG emissions and at the same time it must adapt to the projected effects of climate change. EU member states, as all signatory countries, have to report their GHG emissions to a common reporting framework of the United Nations Framework Convention on Climate Change (UNFCCC) annually.¹ Agriculture produces mainly nitrous oxide (N₂O) and methane (CH₄). Nitrous oxide is released in the atmosphere when people add nitrogen to the soil through the use of fertilizers, while methane emissions come mainly from intestinal fermentation from ruminant animals (cows, sheep, and buffalo). However, both these GHGs are released during manure storage (decomposition of stored manure in oxygen-deprived conditions) and spreading on farmland (European Commission: Agriculture and Rural Development, 2008: 10). It must be noted that emissions and removal of CO₂ from agricultural soils are not counted into the *agriculture* category but under *land use, land use change and forestry* (United Nations, 2006) and carbon dioxide emissions released by agricultural activities related to fossil fuel use in building, equipment and machinery for field operations are assigned to the *energy* sector (Perez Dominguez, et al., 2012: 29).

In 2007, emissions reported from agriculture in the EU were around 462 million tonnes of CO₂-equivalent of GHG emissions. It represented around 9% of the total EU GHG emissions. Methane and nitrous oxide account for 4.3% and 5% of the total agricultural GHG emissions respectively (European Commission, 2009: 7). If CO₂ release was to be included into the EU agriculture GHG emissions figures, it would account for around 1% and other agriculture-related emissions, from the manufacturing of fertilisers and animal feed for instance, are categorised into *industrial process* (Figure 2) (European Commission, 2009: 7). Agriculture GHG emissions in the EU vary greatly within the member states, the main factors being the importance and the relative size of the agriculture sector. Figure 3 shows the share of agricultural GHG emission in total national emissions. The highest shares are to be found

¹ Under the UNFCCC reporting guidelines for Annex I Parties, inventory submissions are in two parts: (1) Common Reporting Format, series of standardized data tables containing mainly numerical informations; (2) National Inventory Report, comprehensive description of the methodologies used in compiling the inventory, the data sources, the institutional structures and quality assurance and control procedure (United Nations, 2006).

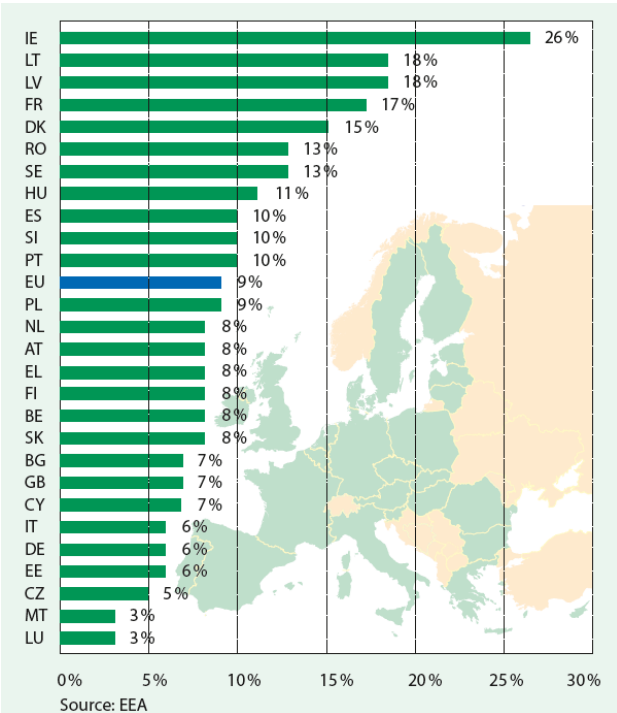
in Ireland (26%), France (18%), Lithuania and Latvia (17%), whereas the lowest figures are recorded in Malta (2%), Czech Republic and Germany (5%).

Figure 2 Share of agricultural sector in total GHG emissions in EU27 in 2005



Source: European Commission - Agriculture and Rural Development, 2008

Figure 3 Share of agricultural sector in total GHG emissions by member states in 2005



Source: European Commission - Agriculture and Rural Development, 2008

3.3 Trends in GHG emissions

Between 1990 and 2008, methane and nitrous oxide emissions have declined in the EU-27 by 20%; this trend contrasts with the global figures which show an increase of 17% in agriculture emission, mainly due to the developing countries (European Commission, 2009: 7). There are several factors that can explain the reduction of agricultural GHG emissions in the EU: increases in productivity and decreases in the number of cattle, improvement of farm practices and management, and implementation of environmental and agricultural policies (Perez Dominguez, et al., 2012: 30). Farming techniques have evolved a better application of fertilisers through improved manure storage conditions. The *Nitrates Directive* (1991) was passed with the aim to protect water quality across Europe by preventing nitrates from agriculture activities polluting ground and surface waters and to promote the use of better farming techniques. The directive is fully integrated into the *Water Framework Directive* (2000) which is a key instrument of European policies for the protection of waters against agriculture pressures. The Common Agricultural Policy through its various reforms has also been an asset in reducing emissions by linking the direct payment for farmers to the fulfilment of environmental conditions.

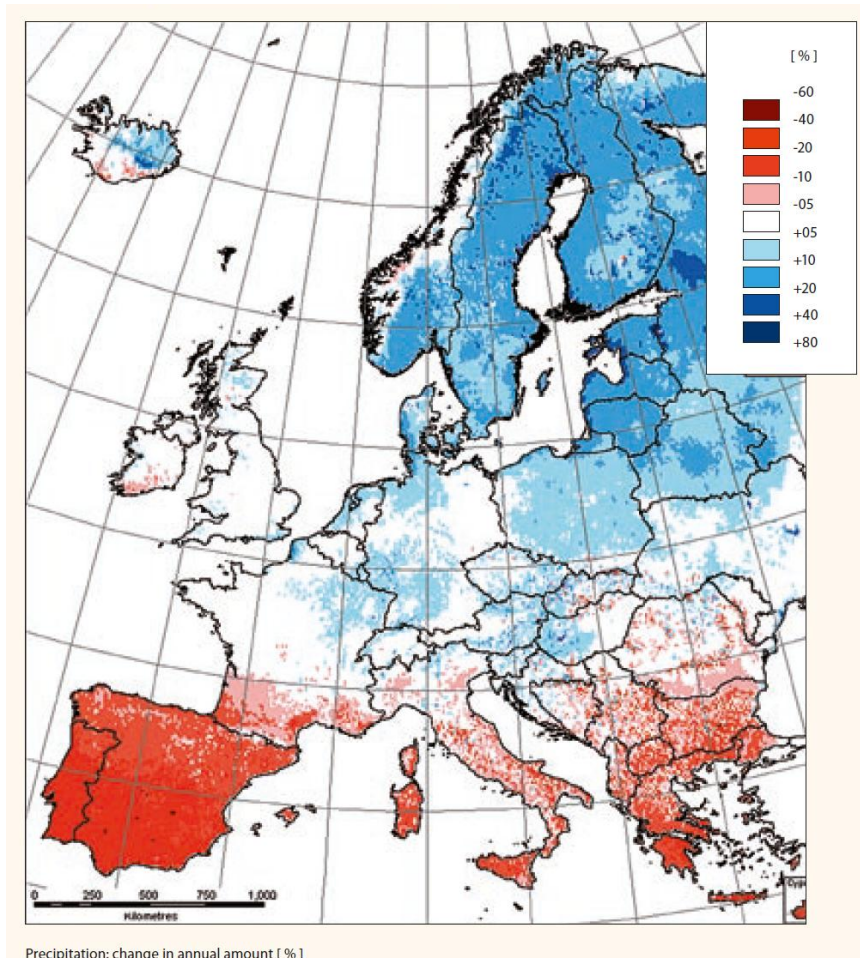
3.4 Specific risks faced by agriculture

3.4.1 Water shortage

Most of the impacts of climate change on agriculture will stem from water. Water is an essential component in the agriculture production chain. Water is needed for irrigation as crops require water to grow, for animal rearing which requires water for drinking and hygiene, and for operations and on-farm processing (Bio Intelligence Service, 2012: 20). Agriculture accounts for a third of all water use in Europe, and this figure increases to 80% in parts of the EU southern regions where irrigation of crops accounts for almost all agricultural water use (European Environment Agency, 2012: 12). Irrigation is necessary to reduce risks in agriculture as it renders yields more stable, meaning that food production can be carried on for longer periods. As water availability can be a source of concern in some regions in the EU, the absence of irrigation could lead to land abandonment due to economic losses (Bio Intelligence Service, 2012: 12).

Climate change will have a strong impact on annual precipitation, which in turn will affect water availability. Figure 4 shows the projected changes in mean annual precipitations in Europe by the end of the 21st century. On one hand, Mediterranean Europe (Portugal, Spain, Southern part of France, Italy, and Greece) is the region most at risk with a decrease of precipitation ranging from -10% to -40% within the area. On the other hand, Western Europe will witness a slight increase in rainfall (between 5% and 10%), whilst Central (+10% to +20%) and Northern Europe (+20% to 40%) are expected to record more frequent rainfall events. Seasonal impacts can also be expected. Winter precipitation will increase; in mountainous region rising temperature will lead to a shift from snow to rain as less water will be stored in ice or snow. Summer precipitation will decrease as less water from mountains will be available (Farmer, Bassi, & Ferguson, 2007: 10). As a result, precipitation will decrease in Southern Europe in all seasons whereas every region in Europe will face a sharp decrease of rainfall, particularly during the summer. The combined effect will be that the uneven distribution of water resources in the EU will become more acute under climate change (Farmer, Bassi, & Ferguson, 2007: 11).

Figure 4 Projected changes in mean annual precipitation by the end of the 21st century



Source: European Commission - Agriculture and Rural Development, 2008

3.4.2 Flood risks

As previously mentioned, central and northern Europe will endure more frequent rain falls by the end of the century. Heavy precipitation will increase floods, which in turn will damage agricultural land. Flooding can be very detrimental to crop harvesting and livestock: it may cause oxygen depletion, diseases, nitrogen loss in plants, as well as affecting livestock by destroying animal housing (Brown, Schmidt, Berg, Monga, & Catoire: 1). Between 1998 and 2009, Europe has been the theatre of over 200 major flood events with an estimated total of 52 billion Euros of insured economic loss (European Commission, 2014). A major flood event happened during the summer of 2002 when Germany, Austria, Czech Republic, Poland, Hungary, Slovakia, Croatia and Romania were all hit by the uprising of the Danube and Elbe

rivers caused by heavy rains. Agriculture is one of the primary sectors that is affected when a flood occurs, as a matter of fact, 100 000ha of agricultural land were damaged during this episode (Interwies, Dworak, Marsden, & Farmers, 2006: 3). Floods can have environmental impacts too, for example when buildings hosting toxic chemicals get inundated or agricultural areas destroyed.

3.4.3 Heat waves and droughts

Historically speaking, heat waves have not been identified as a major issue regarding crops and grassland, however, it has since been estimated that they would become more frequent and intense, and with higher maximum temperatures they may become a cause of disruption of agricultural production in a near future (Fuhrer, et al., 2006: 90). This is in contrast with droughts, the effects of which are very damaging for agriculture, particularly in areas that are water stressed.

European countries have witnessed their most extreme heat wave during the summer of 2003 when record breaking temperatures were registered in many parts of Europe. Not only did it have unfortunate casualties among population (around 30 000 people are estimated to have died, mainly elderly citizens)(United Nation Environment Program, 2004: 2), damages on agricultural production were immense. In France, compared to 2002, the maize grain crop was reduced by 30% and fruit harvests declined by 25% (Intergovernmental Panel on Climate Change, 2007). It has been calculated that in France, Spain, Germany, Estonia, Slovakia, Hungary and Austria the financial losses due to agricultural and forestry damages that summer added up to about 13.1 billion Euros (Fink, et al., 2004).

Droughts are usually more frequent in summer time, particularly in Southern Europe, and as shown previously, with the expected decrease of precipitation in this region, agriculture will face a tough challenge to adapt in the future. It has been estimated that in 2007, at least 11% of Europe's population and 17% of its territory were affected by water scarcity, with the cost of droughts in Europe mounting to 100 billion Euros over the past thirty years (European Commission, 2014).

3.4.4 Pests, diseases and weeds

Agriculture will need to adapt to the negative effects of the likely rise of existing pests, diseases and weeds due to higher temperature and humidity. Although there have been few studies on the effects of climate change on the interaction between crops and diseases, conditions are more favourable for the proliferation of insect pests in warmer climates because many insects can complete a greater number of reproductive cycles (Olesen & Bindi, 2002: 9). Warmer winters may also favour pest proliferation in areas where reproduction is currently limited by the cold, thus causing greater and earlier infestation to the following crop season (Olesen & Bindi, 2002: 9). Climate change will have an impact on weeds as they are influenced by the concentration of CO₂ in the air. This impact will alter the weed-crop interaction, sometimes for the benefit of the crop and sometimes for the weeds, but interactions with other biotic factors (diseases, overpopulation, etc) may also influence weed seed survival and thus weed population development (Olesen J.: 13). Farmers will have to deal with increased pest problems but at the same time they will need to tackle this challenge within the framework of EU policies regulating the use of pesticides. With the rising temperatures, some pests and diseases such as the *Colorado beetle* (pest of potato crops), the *European corn borer* (pest of maize), the Mediterranean fruit fly (provokes damages on fruit crops), are expected to have a considerable expansion northward in Europe (Olesen J.: 13).

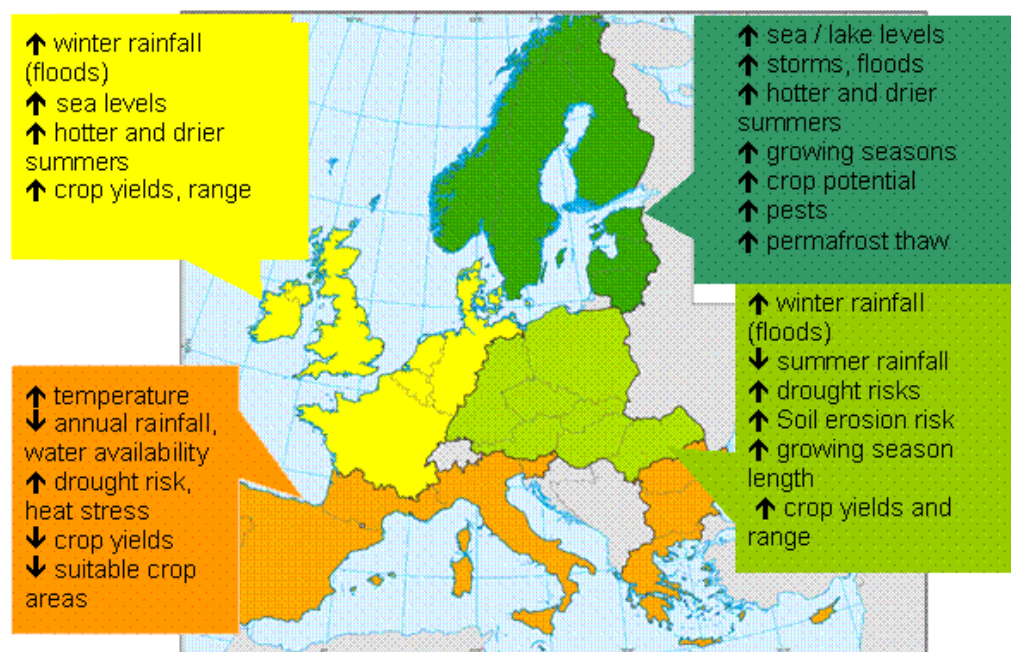
3.4.5 Impact on crop yields and crop distribution

In agriculture, crop yield refers to both the measure of the yield of a crop harvested per unit of land area and to the actual seed generation of a plant. Projected changes in temperature will affect the level and variability of crop yield and livestock management, and the geographical location of agricultural production as agro-climatic zones are likely to shift to more northern latitudes (European Commission - Agriculture and Rural Development, 2008: 22). In the past decades, weather extremes have influenced yields in quite the opposite manner. The 2003 heat wave in Europe brought high temperatures, droughts and a particularly strong drop in crop yields, which has been the longest negative deviation from the long-term trend in Europe in the last 43 years (European Environment Agency, 2004: 74). While some countries (mostly in Southern Europe and Austria) suffered greatly from yield drops (up to 30%), others have benefitted from higher temperatures and lower rainfalls (Finland, Denmark) (European Environment Agency, 2004: 74).

3.5 Climate change effects according to EU regions

Figure 5 shows the results of a study conducted by the European Commission in 2007 regarding the impact of climate change on different European agri-climatic zones under the auspice of the PESETA project (funded by the EU Joint Research Centre). The research project has been focusing on various sectors, such as coastal systems, agriculture, floods, etc, for the periods 2011-2040 and 2071-2100. So far it is the most extensive research project published which indicates that various regions in the EU would not be equally affected. Four different regions have been identified: Northern zones, Western and Atlantic areas, Central EU regions, and Southern and south-eastern countries. The coming section intends to present the finding from the PESETA project.

Figure 5 Projected impacts of climate change in different EU regions



Source: European Commission - Agriculture and Rural Development, 2008

3.5.1 Northern zones

Northern Europe (Sweden, Finland and the Baltic States; dark green zone on the map) is the region where climate change projections suggest the greatest opportunities for agriculture. Important changes in temperature and precipitation are to be expected. These

changes will provoke an increase in violent storms and floods, particularly during winter. However, due to much longer growing seasons, the possibility to cultivate new lands and crops could lead to increases in yield of 40%; however, the downside of these positive changes would be that agriculture may suffer from new pest and diseases (Iglesias, et al., 2007: 48). According to various modelling predictions, southern Norway, parts of south-central Sweden and south-western Finland will shift from a northern agro-climatic region to a more central region (which will be discussed later in this paper) due to changing temperatures.

Northern European farmers may positively welcome the news of longer growing season under the current climate change predictions but they might have to lower their expectations because new risks related to the soil could arise. The research stresses the importance of properly assessing to what extent increases in crop yields can be realised. In fact, early findings indicate that “the majority of soils in the region where the greatest potential opportunities may arise are *podsols* and *leptosols* of limited fertility” (Iglesias, et al., 2007: 55), which in turns could limit the potential for increased crop growth. Another blow that agriculture could face is the potential risk of rising sea levels in the region. Although it is estimated that only a small part of the land area will be affected, it could impact some populated centres such as Stockholm and Riga, whose inhabitants would need relocation to land areas more suitable for agricultural activity. The findings of the research project also indicate that the region will be the theatre of heavy rainfall which may result negatively if the infiltration capacity of the soil is exceeded because it might favour soil pollution in areas where livestock manure is used as fertilizer (Iglesias, et al., 2007: 35).

Permafrost melting will be another source of concern for the agricultural sector because it will lead to destabilization of soils and landslides. In geology, permafrost means a soil that remains at or below the freezing point of water (0°C/32°F). Normal agriculture is impossible over permafrost due to subsidence, and if care is not exercised in selecting areas to be allocated for cultivation, melting of permafrost may necessitate abandonment of fields or their reduction to pasturage (Britannica Academic Edition, 2010).

3.5.2 Western and Atlantic areas

This area includes Denmark, the Netherlands, Belgium, and Luxembourg, northern and western parts of Germany, France (except the southern part), the United Kingdom and Ireland. The increased mean temperatures are expected to be more moderate than in other

regions (Garnett, 2012: 13). The potential rising sea level in the North Sea is considered to be the greatest challenge this area will face, with most of the agricultural production of the Benelux countries and eastern England being under threat of flood. The affected areas are also very densely populated centres such as Antwerp in Belgium, Rotterdam and Amsterdam in the Netherlands, and in the case of population relocation, reduced availability of agricultural lands is expected (Iglesias, et al., 2007: 39). Indirect effects of rising sea level are the increased salination of surface and groundwater, which may damage agricultural lands in low lying regions, which in turn would increase the cost of agricultural production resulting in higher food price for the consumer.

Findings from the PESETA project include that heavy rainfalls are projected to occur on a more frequent period over the winter, with rising risks of flash flooding or water logging which could have damaging effects on livestock health and perhaps to water quality. As mentioned in the northern zone section, heavy rainfalls are likely to exceed the infiltration capacity of the soil with effects on pollution of lands where manure is applied. Warmer summers will occur and their effect will be felt on water availability, diseases and pests.

Various conclusions from can be drawn from research on soil resources in this region attempting to understand to what extent potential crop yield increases can be realised. Findings indicated that the range of soil in Ireland and the United Kingdom is of *cambisols* and *luvisols* types which are potentially high yielding, although Scotland is mainly covered by *podisols* and *histosols* which have a limited fertility. Therefore, soil limitation in Scotland may restrict the potential opportunities coming from climate change (Iglesias, et al., 2007: 37). In the western area (Benelux, Germany etc), the soil resources include a large proportion of *cambisols* and *luvisols* which have a strong capacity to resist drought stress. However, if the drought stress becomes severe, these soils may fail to achieve their yield potential too, and possible reduced water availability during these times may lead to conflicting demands between agriculture and other users. Farmers in this area should expect summers to be hotter and drier which may render cultivation of some traditional fruit crops such as apple or pears more difficult (Iglesias, et al, 2007: 39).

3.5.3 Central EU regions

In central European countries (southern and eastern Germany, Austria, Poland, Czech Republic, Slovakia, Hungary and northern Romania) the PESETA report estimates that

climate change may provide many opportunities for agriculture. The climatic conditions in this area may favour the increase of food production in Europe. New opportunities for growing arable crops and increasing livestock production should be available to farmers, as well as an increased potential for growing forage legume due to rising temperature (Iglesias, et al., 2007: 42). It should be pointed out that these benefits might be of a lesser extent in the southern part of the region (Hungary and Romania).

However, as previously analysed with other EU climatic regions, agriculture will face some risks that may decrease the potential benefits mentioned above. Although rising sea levels might have a minor effect on agriculture production (mainly in the northern parts of Poland), floods are expected to be a problem in areas of the confluence of major rivers, due to the increased frequency of heavy rainfall and storms (Iglesias, et al., 2007: 42).

Central Europe will share the same pattern as observed in the Western area in terms of decreasing summer rainfall, which will put a stress on water use in the region as well as reducing the potential crop yield during this period. Summers are expected to be hotter and drier, particularly in Hungary and Romania, and therefore production of sugar beet and potato may suffer from a lack of irrigation (Iglesias, et al., 2007: 44).

The soil resources are of *cambisol* and *luvisols* types which, as mentioned earlier, are relatively resistant to drought stress and remain fertile. However, in the east of the zone there is a large proportion of *chernozems*. The particularity of these soils is to contain lots of organic matters which are likely to breakdown with warmer temperatures; this breakdown will increase soil fertility in the short term whilst in the long term this fertility is expected to be reduced (Iglesias, et al., 2007: 44).

3.5.4 Southern and south-eastern countries

(Portugal, Spain, south of France, Italy, Slovenia, Greece, Malta, Cyprus, Bulgaria and the southern part of Romania) are undoubtedly the region which faces the biggest challenge to mitigate the climate change effects when it comes to agriculture. Agriculture represents around half of the total surface of the area. The PESETA report indicates that there might be few opportunities for farmers with the main benefits being solely some reduction in the costs of indoor production and to some extent the introduction of new crops such as soya (Iglesias, et al., 2007: 46).

An alarming forecast is the decrease of yearly rainfall which will have the consequence of reducing the summer river flows and therefore, like in other regions in Europe, might increase the risks of conflict over water resources between agriculture and other users. In the Iberian Peninsula, annual rainfall may drop by up to 40% compared to today's levels by the end of the century and if no measures are taken, crop yields could decrease from 10% to 30%, possibly creating domestic food supply risks (European Commission - Agriculture and Rural Development, 2008: 25). Less crop yields and rising temperature will very likely have adverse effects on livestock health.

Agriculture will also face some challenges that are specific to particular regions: the Po Valley in Northern Italy, which is one of the most productive area in the region, will be threatened by rising sea levels, while reduced rainfall and changes in drainage of soils could lead to increased soil salinity and damage to soil structure that might result in desertification (Iglesias, et al., 2007: 48).

3.6 Agriculture as a part of the solution

This paper has so far introduced the various, and mainly negative, effects that rising global temperature will have on agriculture; however, there is a growing acknowledgment of the positive role agriculture can play in climate change mitigation (Food and Agriculture Organisation, 2012.). Through carbon sequestration and the development of bioenergies to substitute fossil fuels, it can help countries to reduce their carbon emissions to meet their international targets. Forestry has so far played a key role in these fields; however agriculture will have a more relevant role to play in the fight against carbon emission in the coming years.

3.6.1 Carbon sequestration

The storage of carbon in agricultural soil (also called carbon sinks) offers considerable potential to remove CO₂ from the atmosphere. Plants absorb CO₂ through photosynthesis and use the contained carbon to build organic matter (European Commission - Agriculture and Rural Development, 2008: 26). In soil that has not been excessively modified through the years (a natural grassland or an agricultural land that has been farmed in the same way for

several years for instance), there is a particular balance between the carbon absorbed by the plants and the carbon that is released in the atmosphere, so that the amount of carbon stocked in the soil does not vary (Direction de la recherche parlementaire, 2001: B). However, any change in land use has the potential to disrupt the carbon cycle. For instance, when forests and grasslands are cleared for agriculture purposes, a large amount of the organic matter is transformed into CO₂ and then released in the atmosphere. Subsequently, when the soil is farmed in the same manner for several years, the amount of carbon stocked in the soil stabilizes. However, if agricultural land use changes in order to enrich the soil with organic carbon, the reverse phenomenon will occur. The soil will stock more CO₂ than it will emit; therefore the CO₂ is removed from the atmosphere and stocked into the soil: this process is called carbon sequestration (Direction de la recherche parlementaire, 2001: B).

Carbon sequestration in agricultural soil could be a potentially suitable process to ensure that countries cut their emissions, and therefore it has been implemented into the Kyoto Protocol. However, the EU showed some reluctance over this decision and hesitated to allow member states to use this technique to curb their emissions due to uncertainties over the results (Young, Weersink, Fulton, & Deaton, 2007: 32). This reluctance was fueled by the strong opposition of the Climate Action Network (an alliance of 365 European environmental NGOs) which lobbied greatly to leave carbon sequestration out of environmental policies (Young, Weersink, Fulton, & Deaton, 2007: 33).

EU leaders gradually shifted position to adopt a more positive attitude toward the use of agricultural soils as carbon sink. In 2007, the European Commission launched the Soil Thematic Strategy which aimed to provide a regulatory framework for soil use within the European Union, including carbon sequestration activities. So far, this Strategy has not been translated into a proposed Soil Framework Directive mainly because a minority of member states is still opposed to carbon sequestration (European Commission, 2010).

3.6.2 Bio-energy

The EU is very committed to fight climate change but also to increase security of its energy supply. Bio-energy from forestry and agriculture has been targeted as a very useful sector for both commitments. The Common Agricultural Policy provides the framework for agriculture and forestry to deliver biomass (biological material from living or recently living

organisms) for energy and to encourage the use of bio-energy in rural areas. Bio-energy is one source of renewable energies among many other such as wind, solar, geothermal and hydraulic. If produced in a sustainable way, it can save greenhouse gas emissions. As for today, bio-energy accounts for more than two thirds of the total renewable energy in the EU (European Commission, 2010). Biomass for energy comes from mainly forestry but also from agriculture and organic waste. It is in large quantity available in Europe. Currently the share of agriculture in bio-energy is still modest, but it is estimated that it has a very promising potential for growth (European Commission, 2010). The EU agriculture currently provides bio-energy for biogas and biofuels (biodiesel and bioethanol).

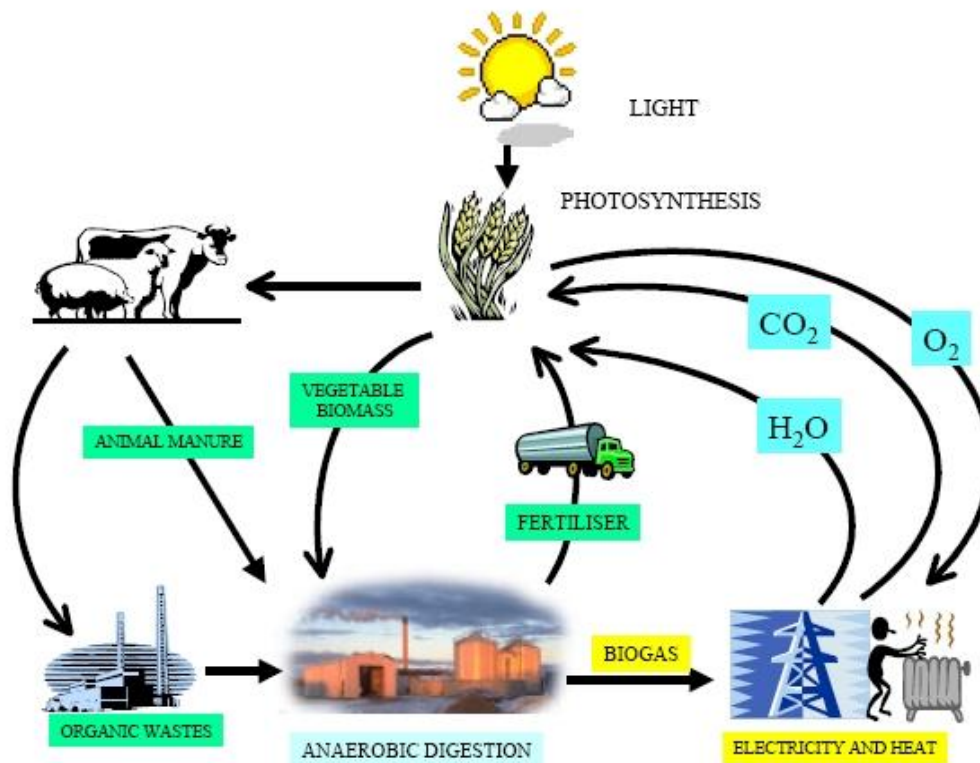
3.6.2.1 Biogas

Biogas is a gas whose primary elements are made of methane (around 65%) and carbon dioxide (about 35%). It is the product of the natural decomposition of any organic substance of animal or plant origin due to the activity of anaerobic (functioning in a non-oxygen environment) bacteria. Major sources of methane are all animal excrements, waste landfills and any other organic material that is left untreated.

Figure 6 summarizes the chain of production of biogas as well as the various way of benefitting from it. Biogas can be used as a natural gas to produce heat and electricity in particular for cooking and lightning. Asian countries have so far been particularly reliant on biogas as it is estimated that around 2million rural biogas plants, mainly in China and India, are serving the daily energy needs of local families (European Biogas Association, 2011: 5). Benefits for agriculture are to be found both economically and in terms of energy consumption. The development of the biogas industry has increased the potential sources of income for farmers as they get compensated for the use of their animal wastes, and biogas provides a reliable energy for heating stables and pens (European Biogas Association, 2011: 14). There is no particular policy at the European level concerning biogas but it is covered by all the policies that deal with renewable energies and bio-energy. The EU Waste Framework Directive (2008), encourages member states to organize separate collection of bio-waste, and a Green Paper on the management of bio-waste in the EU (released by the European Commission in 2008), emphasized the benefits of separate collection which would facilitate biogas production (EurActiv, 2010).

Figure 6

Biogas production cycle



Source: Holm-Nielsen, Al Seadi, & Oleskowicz-Popiel, 2009

3.6.2.2 Biofuels

Under the European Directive 2009/28/EC, the EU established the goal to reach a minimum of 10% of renewable energy in the transport sector in every member states by 2020. The Directive aimed to ensure the use of sustainable biofuels only, which guarantee a clear and net greenhouse gas saving without the negative impact on biodiversity and land use (European Commission - Energy, 2010). Biofuels are a renewable energy source produced from natural (bio-based) materials, which can be used as a substitute for petroleum fuels (Demirbas, 2009: 1). As mentioned earlier, there are two kinds of biofuels: biodiesel and bioethanol.

Biodiesel is a renewable fuel produced from vegetable oils such as rape seed, sunflower seed, soybean oils, as well as used frying oils or animal fat. Biodiesel is particularly relevant in the transport sector as it can reduce this sector's greenhouse gas emissions. It also

plays a very useful role in agriculture due to the CAP allowing the arable raw materials needed for biodiesel production to be grown on set-aside land, areas which would otherwise be put out of production (European Diesel Board, 2013). Today, biodiesel production uses around 3million hectares of arable land and it accounts for 82% of the total biofuel production in the EU (Bozbas, 2008: 546).The EU remains the world leader in biodiesel production, extracting 10,187Ml in 2009 (figures equivalent to 55-60% of the world production), followed by the United States, Brazil and Argentina (Biofuels Platform, 2010). Germany and France are the EU's main producers. Bioethanol (first generation) is produced by distillation from crops such as corn, wheat, sugar beet and sugar cane. A second generation of bioethanol, called *cellulosic ethanol*, is produced from a wider range of feedstock, such as agricultural residues and woody raw material (European Biofuels Technology Platform, 2013).Bioethanol is the most produced biofuel worldwide with around 74billionlitres in 2009, mainly due to heavy production in the United States (54%) and Brazil (34%); and with a production of 3.7 billion liters, the EU rank third far behind the two giants (Biofuels Platform, 2010). France, Germany and Spain are the largest member states producing bioethanol within the EU.

3.6.3 Organic farming

Organic farming can be defined as “a production system that sustains the health of soils, ecosystem and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects (IFOAM, 2013).” To achieve this, organic farming relies on several agricultural practices, such as a very limited use of chemical synthetic pesticide and synthetic fertilizer, livestock antibiotics, food additives and processing aids and other inputs; a complete prohibition of the use of genetically modified organisms; taking advantage of on-site resources, for instance livestock manure for fertilizer or feed produced on the farm; raising livestock in free-range, open-air systems and providing them with organic feed (European Commission, 2013). Organic agriculture is very beneficial for the health of soils. The healthier a soil is, the more carbon it will be able to sequester, thus contributing to mitigation of agricultural greenhouse gas emissions. Several management practices used by organic farms increase the return of carbon to the soil, raising productivity and favoring carbon storage (Food and Agriculture Organisation, 2011).

In 2007, the EU passed a legislation regarding organic production and labelling of organic products. This legal framework puts an emphasis on environmental protection, biodiversity and high standards of animal protection, and at the same time enhances sustainable cultivation systems and a variety of high-quality products (European Commission, 2011). In 2008, the largest organic areas in the EU27 were to be found in Spain (1.3mn ha), Italy (1.0mn ha), Germany (0.9mn ha), the United Kingdom (0.7mn ha) and France (0.6mn ha); and 4.7% of the total agricultural area in the EU27 was dedicated to agricultural farming (European Commission, 2013).

3.6.4 Concluding remarks

The aim of this chapter was to assess what threats climate change is posing to the EU's agriculture. When it comes to climate change, agriculture is both a cause and a victim. It directly faces the consequences of rising temperatures and changing climate, but it can as well play a part in mitigating their effects. The results show that farmers will need to adapt their working methods in order to mitigate climate change effects. Agriculture is not the largest polluting sector in the EU but still accounts for about 9% of the total EU's emissions. Agricultural emissions are unique compared to other sectors: nearly half of its emissions stems from ruminants, which release methane; while the other half, of nitrous oxide origin, is more traditional. Although measures can be taken to reduce the use of nitrogen, mainly from pesticides use, it seems hardly feasible to address efficiently the issue of methane emissions unless by drastically reducing the amount of cattle across the EU. Findings have shown that the trend in EU GHG emissions has been decreasing significantly by 20% between 1990 and 2008 while they have been on the rise in the rest of the world (17%) at the same period, mainly due to the rise of emissions in the Third world countries. The positive results in the EU can be attributed to better productivity of the agricultural sector, more performant farming techniques involving a better use of fertilisers and an improved storage of manure, but as to increased environmental legislations that enhanced farmers' environmental requirements. The effect of climate change will be adversely distributed across the EU. Farmers will not face the same issues depending on their location. While southern European farmers will struggle with water shortages due to the decrease of precipitation, their northern counterparts will be fighting with rising sea levels. Increased number of precipitation events will lead to more frequent floods in Central and Eastern Europe, around the two large rivers in particular (the

Elbe and the Danube). These findings demonstrate that farmers will have to adapt to new circumstances. On the positive note, agriculture can contribute to mitigate climate change. Through carbon sequestration and the development of bioenergies to substitute fossil fuels, it can help countries to reduce their carbon emissions to meet their international targets. Forestry has so far played a key role in these fields; however agriculture will have a more relevant role to play in the fight against carbon emission in the coming years. Adequate land management offers various possibilities to capture carbon from the air. The development of the organic agriculture sector could be a push for establishing the basis of a sustainable agriculture, which preserve the environment as well. Climate change mitigation cannot be achieved without a proper legislation that regulates agricultural practices, and the Commission to supervise the process.

4 Greening the CAP

This chapter will focus on the policies that regulate agriculture in the EU, and will address the question whether or not the agricultural sector is backed by efficient EU legislations to adapt to climate change. Not only is the CAP among the oldest policies of the EU, but it is without doubt one of those which bring intense discussions among member states, opposing those with a large farming sector to the rest. The creation of the CAP is closely related to France's national interests in the wake of WWII. In order to protect its agriculture from global market, France political elite urged the Community to establish a common policy which would provide financial support for farmers. Several CAP reforms have been amended through the decades, but its mechanism has remained the same. This chapter will explore the new environmental features the Commission has proposed in the 2013 CAP reform, which are crop diversification, maintaining permanent grasslands, and the creation of ecological focus areas. The proposal also suggested the introduction of a *Greening Payment*, in which 30% of the available national funds would be linked to the provision of certain sustainable farming practices, to reward farmers that provide environmental public goods. These measures have for mission to help the agricultural sector to mitigate climate change effects. Farmers will also need to comply with a set of environmental rules that the EU implemented since 1991 and the Nitrate Directive. A part of this chapter will also be dedicated to identify all the partners involved in the EU policy making process. The Lisbon Treaty (2009) gave new powers to the European Parliament, which now share the decision power with the Council in regard of the CAP. Nongovernmental groups play an important role in policy shaping, as major stakeholders; they actively seek to influence the EU institutions.

4.1 Agriculture: a national interest

France has been since the early days of the Community been very attached to the CAP, and that has been no secret for its European partners. It is said the CAP was part of the talks at the origin of the European Community in which "France agreed to open its industries to German competition in exchange for Germany's promise to allow France to shelter its large farms from global market forces." (Gordon, 2005) Agriculture has been a very important variable that shaped France's European policy, particularly during the 1960's under President

De Gaulle. His personal opposition to Britain's membership to the EC was motivated by its fear the United Kingdom would serve as a Trojan horse for American interests but also because he considered the on-going talks regarding the future CAP could be jeopardized by the British. They had developed a different type of agricultural system largely based on liberalisation and free trade and a CAP shaped according to France's needs would not be in their interests, but once the CAP would be finalised the UK would have to accept it if it wished to join the EC (Troitino: 147). The *Empty Chair* crisis is another example of De Gaulle's willingness to defend the French interests related to agriculture. On the one hand he demanded that the Community would finance the CAP, which was met with strong opposition by other Community members, and on the other hand he opposed the shift from unanimity voting to majority voting as it could weaken France ability to defend its interests, particularly its farmers. He went as far as provoking a political crisis within the European Community by withdrawing French ministers from Council meetings and threatening France's withdrawal from the Community (Troitino: 148). De Gaulle's intransigence resulted in a compromise reached with the other member states, known as the *Luxembourg Compromise*, which meant that in case of majority voting, any member state could use its right to veto if its national interests were at stake. In other words, France was granted a very strong political power to protect its agricultural sector at the European level. A couple of decade later, the same political line was to be followed with France's President Valéry Giscard d'Estaing coining agriculture to be "*le pétrole de la France*", a word game referring to the export potential of agricultural products in the same fashion as oil rich countries export their natural resource (Milzow, 2012: 38).

At the European level, agriculture comes under scrutiny every time the EU budget is to be agreed by the member states. In February 2013, EU leaders reached an agreement regarding the Community budget for the 2014-2020 period, with agriculture receiving around 38% of the financing shares. The deal came after France and other major farming member states managed to block attempts by Britain and its northern European allies (the Netherlands, Sweden and Denmark) to reduce significantly the funds allocated to the CAP (De la Hamaide, 2013). Although the relative share of agricultural spending will decrease, French President Francois Hollande regarded the deal as a victory for the French agricultural sector as he managed to maintain its subsidies untouched while other countries saw their shares being reduced (De la Hamaide, 2013). The battle between "CAP reformist" countries and "business-as-usual" countries now balances in favour of the latter camp, in particular since the 2004 Easter European enlargement as the new member states have large rural communities which

strongly benefit from the CAP. France found a new ally with Poland which became one of the strongest defender of the European farming policy due to its large agricultural sector (Ruitenberg, 2011).

4.2 Climate change: political challenge

In the early 1990's, European leaders have committed to transform Europe into a highly energy-efficient and low carbon economy. The European Community took part in the negotiation of a *United Nations Framework Convention on climate change*, and ratified the text in December 1993 which came into force in March 1994. The Framework Convention can be regarded as having paved the way for the establishment of major principles in the international fight against climate change, among these the principle of “common but differentiated responsibility”(Europa, 2011). However, the Convention did not set commitments in figures on a country by country basis regarding the reduction of greenhouse gas emissions. Binding commitments were found in the Kyoto Protocol when all the parties that ratified the Convention decided to take a step further in the fight against climate change. The Protocol, signed in 1998 sets goals for the reduction of GHG's in industrialised countries for the period over 2000. It tackles six GHG's: carbon dioxide (CO₂), methane (CH₄), nitrous Oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). The major improvement compared to the Framework Convention is that binding quantified objectives to reduce and limit GHG's have been agreed, at the international level. The main objective was to reduce the total emissions of the developed countries by at least 5% below 1990 levels during the 2008-2012 period, with EU countries set to reduce their emissions by 8%, except Poland and Hungary (6%), Croatia (5%), and Malta and Cyprus which were not listed as industrialised countries at the time of the Convention.(Europa, 2011)

Around 11% of the total greenhouse gas emissions worldwide are emitted within the European Union, but due to measures being taken at the European level as well as the national level within member states, the EU has been well on tracks towards reaching its targets under the Kyoto Protocol. According to estimates for 2012 by the European Environment Agency, EU-15 emissions averaged 12.2% below base-year levels during the 2008-2012 period, which means targets have been successfully achieved, the same can be said for the remaining 11 member states that have different emissions reduction objectives (European Commission, 2012). By 2020, the EU has committed to reduce its GHG's emissions by 20% below 1990

levels. This commitment is among the key elements of the *Europe 2020* growth strategy and it is implemented via a package of binding legislations. This emissions reduction could increase up to 30% if other major emitting countries would commit to undertake their fair share of a global cut of GHG's emissions. The EU initiatives to combat climate change include (European Commission, 2012):

- The European Climate Change Program, which has led to the implementation of various legislations.
- The EU Emission Trading System, one of the key tools to reduce GHG's emission from the industry sector.
- The adoption of legislation to increase the share of energy consumption produced by renewable energy sources, such as wind, biomass, and solar to 20% by 2020.
- Binding targets to reduce emissions from new cars and vans.
- The support to the development of carbon capture and storage technologies to trap and store CO₂ emitted by power stations and other major industrial installations.

Although most of the key decisions regarding these ambitious goals are set at the EU level, the fight against climate change is not a new policy agenda among all member states. The Nordic countries (in particular Denmark and Sweden) have a long tradition of environmental awareness. Within their regional cooperation institution, the *Nordic Council*, the Nordic member states have been very active in taking action to combat climate change and global warming. In 2012, the Nordic ministers of environment have adopted the Svalbard Declaration, which aims to fight against short-lived climate gases such as soot and ozone, gases that are extremely harmful for the climate in the Arctic and other Nordic adjacent areas (Norden, 2012).² Other elements that underline the Nordic countries commitment to climate issues are the progressive Swedish energy policies that can be traced as far back as 1990 when the national government enacted one of the world's first carbon taxes, and the country's ambition to increase renewable energy production up to 50% by 2020 (Worldwatch Institute, 2013). This environment-driven attitude finds its echo at the EU political level with the establishment of the European Environment Agency in Copenhagen in 1994 and the appointment of Connie Hedegaard, former Danish Minister of Environment (2004-2007) and Climate and Energy (2007-2009), as the EU's first ever Commissioner for Climate Action in February 2010.

²<http://www.norden.org/en/news-and-events/news/nordic-council-the-nordic-countries-must-do-more-for-the-climate>, 11/11/13

4.3 THE CAP

The Common Agricultural Policy (CAP) is one of the oldest European integration projects currently in force. It was mentioned in the Treaty of Rome in 1957 but officially implemented in 1962. Its main purpose was to restore Europe's food productivity which was heavily hit by World War II. According to the Article 39 of the Treaty on the Functioning of the European Union (TFEU), the objectives of the CAP shall be (Europa, 2011):

- To increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of the factors of production, in particular labour.
- Thus to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture.
- To stabilise markets.
- To assure the availability of supplies.
- To ensure that supplies reach consumers at reasonable prices.

At the end of WW II, European countries faced the risk of food shortage, and with the insistence of France, European leaders agreed to establish a common framework on order to support agriculture. In spring/summer 1958, a committee of experts gathering Members of the European Commission, each Member States' Minister of Agriculture, representatives of farmers' unions and national experts worked together to find solutions to get Europe's agriculture back to pre WW II levels. Agriculture Commissioner Sicco Mansholt was given the task to draft proposals which were presented in 1960. Following Mansholt proposals, the European Council decided in January 1962 upon the organisation of six common agricultural markets (cereals, pig meat, eggs, poultry meat, fruit and vegetables and wine) to: introduce rules on competition; establish a schedule for dairy products, beef and veal, sugar and other measures; assist intra-Community trade; create the European Agricultural Guidance and Guarantee Fund (EAGGF) which would help to finance the operations of the CAP (a Guarantee Section for prices and a Guidance Section for structural measures) (European Commission - Agriculture and Rural Development, 2013). When some products would not find a buyer, the Community would step in to buy these products at a guaranteed price,

negotiated every year and in general higher than the international market price, which would ensure farmers receive a fair contribution to live on.

Already in the early 1970's the ECC, which welcomed three new member states (Denmark, the United Kingdom and Ireland joined in 1972), was able to be food self-sufficient but new problem arose. In several sectors, such as milk, cereals and beef, the production reached an over capacity level. This surplus could not have been absorbed by the market and storing products was becoming a heavy burden on the CAP budget. The main solution was to export products to the rest of the world, but due to the expensive production cost in the ECC compared to other markets, farmers found it difficult to attract buyers. The Community decided to subsidize farmers who accepted to sell their production at a lower price compared to market value, but such methods were met with criticism with members of the World Trade Organisation (WTO) because they were running against international trade rules (Toute l'Europe, 2013). The extensive production model that the CAP encouraged started to have environmental consequences such as water pollution, soil nutrient depletion, phenomena that were not necessarily thought about when the CAP was drafted. And financially speaking, some Member States, in particular the United Kingdom, began to raise concerns about the amount of funds that were transferred to the CAP. Between 1972 and 2003 several reforms of the CAP occurred, which aimed to reduce surpluses by the introduction of quotas, to decrease the amount of Community funds put into the CAP, to emphasize rural development, environmental protection, respect of health, animal welfare protection and to adapt the CAP to the rules of the WTO (Toute l'Europe, 2013).

4.3.1 Mechanism

Today, the CAP is articulated around three main principles. It establishes a single agricultural market in which customs barriers between member states have been removed and health rules and technical standards have been harmonised among all members; a financial solidarity which means that funds are allocated according to needs regardless of member state contributions to the EU budget; a Community preference which supports agricultural products grown in the EU. These principles are assisted by several mechanisms which help run the CAP (Toute l'Europe, 2013). The Common Market Organisation for agriculture is responsible for guaranteeing the stability of the market for several products; it establishes rules on competition and regulates prices and subsidies. In the 1992 reform, the principle of direct

subsidies to farmers was implemented in order to provide them with a guaranteed minimum income independent of the quantity produced, which was thought to avoid overproduction and trade distortion. Financial incentives have been created to push farmers to choose farming methods that respect the environment; the cross compliance principle means that subsidies are given to farmers who use methods respectful to the environment and animal welfare. Measures to develop the rural world have also been taken, which are necessary to maintain and improve farmers living conditions.

The CAP is financed by two distinct funds: the European Agricultural Guarantee Fund (EAGF) which finances the direct payments to farmers and takes measures necessary to respond to market distortion (private and public storage, export refunds, etc.), and the European Agricultural Fund for Rural Development (EAFRD) which finances rural development programs in the member states. Created in 2007, these funds have replaced the EAGGF and work under the surveillance of the European Commission (Europa, 2009). It does not make direct payment to beneficiaries; under the principle of shared competence, it is the role of member states to pay the beneficiaries, often delegating this task to national or regional agencies. However, these agencies must have been officially accredited by the Commission in order to get refunded.

In 2010, the CAP was the second highest area of spending after the social cohesion. Around 50 billion € of the EU budget were allocated to the CAP, which represented a little more than 40% of the whole Community budget and less than 1% of the EU Gross Domestic Product (European Commission, 2014). The main beneficiaries of CAP payments were France (17%), Spain (13%), Germany (12%), Italy (10.6%) and the United Kingdom (7%) (BBC, 2013).

4.3.2 The CAP after 2013

In April 2010, Commissioner for Agriculture and Rural Development Dacian Cioloș launched a public debate in order to reform the CAP for 2014-2020. The Commission recognized that farmer incomes will face various pressures as more risks are expected, as well as a slowdown in productivity, and a margin squeeze due to rising input prices; and at the same time, agriculture and rural areas are being called upon to increase their efforts to reach Europe 2020 ambitious climate and energy targets and biodiversity strategy (United States

Misison to the European Union, 2012: 3). After 2 years of negotiations, on the 26 June 2013, the Commission, the European Parliament and the Council reached a political agreement on the reform of the CAP, and from the words of Commissioner Ciolos (European Commission, 2013):

“I am delighted with this agreement which gives the Common Agricultural policy a new direction, taking better account of society’s expectations as expressed during the public debate in spring 2010 [...] These decisions represents the EU’s strong response to the challenges of food safety, climate change, growth and jobs in rural areas.”

The key aims of the proposals can be summarized as (United States Misison to the European Union, 2012: 3):

- More targeted income support in order to stimulate growth and employment; additional investment in research and innovation.
- Support for rural employment and entrepreneurship, and aids for young farmers to establish themselves.
- Green payments for long term productivity and for preserving ecosystems; and encouraging agri-environmental initiatives.
- More responsive and adequate crisis management tools in order to meet new economic challenges; and a better account taken of more vulnerable areas.
- A more efficient and simpler CAP.

The reform is axed under four main topics which are Direct Payments, the Single Common Market Organization (CMO), the Rural Development, and the Horizontal Regulation for financing, managing and monitoring the CAP. Direct Payments will be distributed in a fairer way between member states, regions and between farmers by shifting from the “historical references” based system to a more clear and convergent system of payment. With the introduction of a *Greening Payment*, in which 30% of the available national funds will be linked to the provision of certain sustainable farming practices, a significant share of the subsidy will be allocated to reward farmers that provide environmental public goods (European Commision, 2013: 1). Amendments to the CMO rules aim to improve the market orientation of EU agriculture in terms of facing increased competition on world markets, whilst at the same time providing farmers with a safety net in case of external uncertainties (European Commision, 2013: 4). Rural development will remain under its current form, with member states or regions continuing to draw their own multi-annual

programs in order to deal with the needs of their own rural areas. The new rules will aim to provide a more flexible approach than its current one. Measures to develop rural areas will no longer be classified at EU level into axes with allocated minimum spending requirements per axis; instead, member states or regions will have the freedom to decide which measures to use (and how) in order to achieve targets (European Commission, 2013: 5). There are six priorities to the rural development policy that the CAP will address (European Network for Rural Development, 2013): (1) Fostering knowledge transfer in agriculture, forestry and rural areas and innovation; (2) Enhancing the competitiveness of all types of agriculture and enhancing farm viability; (3) Promoting food chain organization and risk management in agriculture; (4) Restoring, preserving and enhancing ecosystems dependent on agriculture and forestry; (5) Promoting resources efficiency and supporting the shift toward a low-carbon and climate-resilient economy in the agriculture, food and forestry sectors; (6) Promoting social inclusion, poverty reduction and economic development in rural areas. Member states will have to spend at least 30% of their rural development funds from the EU budget on certain measures that are related to land management and the fight against climate change, and a minimum of 5% on the LEADER³ approach (European Commission, 2013: 5).

Horizontal Regulations cover a wide range of activities, such as: the Farm Advisory Service in which the list of issues on which member states must provide farmers with advice now includes several other EU legislations and framework (Water Framework Directive, cross compliance, use of Pesticides Directive, etc); a Crisis Reserve, created every year and amounting 400€ (in 2011 prices) with the possibility of refunding farmers in direct payments if the amount is not used for a crisis; Cross Compliance, which links any direct payment with farming practices that respect certain requirements related to environment, climate change, good agriculture condition of land, human, animal & plant health standards and animal welfare; Transparency, Monitoring and Evaluating the CAP, with member states required to provide full transparency of all beneficiaries and the Commission to deliver a report on the performance of the CAP every four years (European Commission, 2013: 7).

³ French acronym standing for *Liaison Entre Actions de Développement de l'Économie Rurale*, and meaning "Links between the rural economy and development actions" is a local development method which allows local actors to develop an area by using its endogenous development potential.

4.3.2.1 Greening of the CAP

For the purpose of this paper, financial and technical aspects of the CAP reform will be left aside in order to focus in particular on the elements that deal with the greening of the CAP, as well as the environmental measures put forward in agriculture to participate in the fight against climate change. These elements will be discussed and analyzed in more depth in a following chapter, with the aim to assess if they match the expected results of the reform. The proposals to make the CAP greener are axed around three elements: *crop diversification*, *retaining permanent grasslands*, and *ecological focus areas*.

The main goal of the crop diversification proposal is to make farms with monoculture more sustainable and environmentally friendly. This measure requires farmers that own at least 30 hectares or more of arable land to cultivate a minimum of three different crops, with no crops covering more than 70% of the land or less than 5% of the total arable area. The requirement is reduced to two different crops if the farm size is between 10 and 30 hectares, with no crops covering more than 75% of the total land. Permanent grasslands are not to be counted in the basis for calculation of the total agricultural area of the business, and grasslands in crop rotation shall be included.

Permanent grassland is considered to be a land used to grow grasses or other herbaceous forage either naturally or through cultivation, and which isn't included in the crop rotation of the holding for five years or longer (The Wildlife Trust, 2012). The proposal requires farmers to keep existing areas of permanent grasslands. Protecting permanent grassland is a compulsory requirement of *Good Agricultural and Environmental Condition* (GAEC)⁴ with member states introducing minimum frequency and periods for grazing, mowing, removal of shrubs/plants and other actions at parcel level. And the new measure intends to ensure that grassland does not move around, which would result in increased GHG emissions and nutrient release (European Commission, 2011: 10).

In its bid to make farming more respectful to environment, the Commission proposed that arable farms across the EU should identify Ecological Focus Areas (EFAs) on 7% of their land. It means that farmers should devote that amount of land to terraces, landscape features, fallow, buffer stripes and afforested areas, for example (Royal Society for the Protection of Birds, 2012: 3). However, areas that are already set aside (meaning land left out of production

⁴It refers to a set of EU standards defined at national or regional level, aiming at a sustainable agriculture, as described in Annex III of Council Regulation 73/2009.

for environmental purposes) under cross compliance (e.g. buffer strips) would count towards the requirement, and very small parcels of arable land or permanent crops should be exempt from this requirement (European Commission, 2011: 12).

4.3.3 Decision making in the EU

The treaty of Lisbon that came into force in January 2009 can be seen as a complete and exhaustive reformulation of the two founding Treaties that are the EU Treaty (also known as Maastricht Treaty, 1992) and the EC Treaty (Treaty of Rome, 1957), the latter is now renamed *Treaty on the Functioning of the European Union*. It reformed the decision making process by bringing changes in the legislative procedure, now divided in two kinds: *ordinary legislative procedure* and *special legislative procedures*. The ordinary legislative procedure replaces the former *co-decision procedure* and involves the European Parliament alongside the Council as a co-legislator, whereas the special legislative procedures substitutes the former *consultative*, *cooperation* and *assent procedures* in which the Council remains the sole legislator and in which the European Parliament's role is limited to consultation or approval depending on the case (Europa, 2011).

4.3.3.1 Lisbon Treaty and Agriculture

A general classification of competences into three categories has been incorporated into the TFEU, namely *exclusive competences*, *shared competences*, *coordination competences* and *support actions*. Article 4 (2d) recognises agriculture as a shared competence between the Union and the member states. It means that the European institutions will apply the subsidiarity principle in areas that do not fall within the exclusive competence of the Union (Article 5(3) and Article 12 TEU) (European Parliament, 2014).

The Treaty now includes new paragraphs to the provision for agriculture (Article 43), in particular

Art. 43.2 (Eur-Lex, 2012) *The European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee, shall establish the common organisation of agricultural markets provided in Article 40.1 and other provisions necessary for the pursuit of the objectives of the Common Agricultural Policy (CAP) and the Common Fisheries Policy (CFP).*

The Lisbon Treaty has important budgetary implications for agriculture too. Although it does not specifically deal with the CAP budget, Article 314 states that *the European Parliament and the Council, acting in accordance with a special legislative procedure, shall establish the Union's annual budget* (Eur-Lex, 2012). Indirectly, the EU Parliament has been given strong powers to decide over the budget that is allocated to the CAP, on an equal footing with the Council.

4.3.3.2 Agriculture and Fisheries Council

The Council brings together ministers from all the EU member states that are responsible for these policy areas and their task is to discuss, negotiate and adopt legislation. Either the Commissioner for Agriculture and Rural Development or the Commissioner for Maritime Affairs and Fisheries participates in these meetings, which occur on a monthly basis. The Agriculture and Fisheries Council is prepared either by the Special Committee on Agriculture (composed of senior agriculture officials from member states and from the European Commission) or by the Committee of Permanent Representatives depending on the agenda. Several working parties, responsible for preparing decision and policy-making on agriculture, prepare the work of these committees. The working parties are composed of experts from the member states and from the European Commission.

4.3.3.3 European Commission's Directorate-General for Agriculture and Rural Development

Since February 2010, the Directorate-General for Agriculture and rural Development is under the authority of Commissioner Dacian Cioloș. Composed of approximately 1000 employees, it is responsible for the implementation of agriculture and rural development policy, the latter being managed in conjunction with other Directorate-Generals (DGs) that deal with structural policies. The DG Agriculture and Rural Development is composed of 13 directorates that deal with all aspects of the CAP, including farm support, market measures, rural development policy, quality policy, financial and legal matters, analysis and evaluation, international relations linked to agriculture (European Commission, 2012).

4.3.3.4 European Parliament Committee on Agriculture and Rural Development

The Committee on Agriculture and Rural Development (COMAGRI) is responsible for examining and amending the European Commission's legislative proposals by preparing reports on agricultural policy for later adoption by the European Parliament in plenary session. COMAGRI is composed of 45 full members and 45 substitute members; many of these members have close ties with agriculture through their origins or previous activities (European Parliament, 2013). The Committee is responsible for (European Parliament, 2013):

- The operation and development of the CAP
- Rural Development
- Legislations on animal husbandry and welfare, veterinary and plant-health matters, animal feeding, etc.
- Improvement of the quality of agricultural products
- Supplies of agricultural raw materials
- Forestry

Before proposing any new initiatives, the Commission assesses the potential economic, social and environmental consequences that they could possibly have by preparing an *impact assessment* in which advantages and disadvantages of future policies are set out (European Union, 2013). Also, NGOs, local authorities, representatives of industry and civil society and groups of experts are consulted by the Commission in order to make sure that legislative proposals correspond to the needs of those most concerned. National parliaments are allowed to formally express their reservation if they believe that particular issues would be better dealt at national rather than EU level (European Union, 2013). Subsequently, the EU Parliament and the Council review proposals and propose amendments. If they don't reach an agreement upon amendments, a second reading is necessary. During the second reading, both the Parliament and the Council can again propose amendments; at that stage, the Parliament has the power to block the proposed legislation if it does not agree with the Council. If both institutions reach an agreement on the amendments, the legislation can be adopted. If again they cannot agree, a *conciliation committee* is set up in order to find a solution. However, both the Council and the Parliament have the power to block the proposal at this final reading (European Union, 2013).

4.3.4 Lobby groups in the EU

The gradual transfer of competences from the Member States to the European institutions has been followed by an increasing number of pressure or lobby groups. It is estimated that the 15 000 EU Commission and Parliament officials deal with around 20 000 lobbyists on a daily basis (Coen, 2007: 3). A pressure group is an organization that works to influence public policies in the interest of a particular cause, and lobbying can be understood as the action of influencing policy makers in order to obtain policies that will serve the organization's cause. There are two kinds of pressure groups: the one that pursue private economic interests, they are mostly interested in competition and trade laws, and those that are dedicated to the public or social interest and are mainly nonprofit organizations, such as environmental groups or human rights associations (Civitas, 2012). It is undisputed that lobby groups often have the resources to carry out tasks for which decision makers may possibly find themselves with limited funds (for instance studies, analysis, etc.) and can provide a technical expertise in their field of competence (Coen, 2007: 6). In this regard, it is not uncommon that lobbyists and EU officials would work hand in hand. A sound understanding and knowledge of the EU bureaucracy is what can make the difference between a successful and an inefficient lobbying action, which underlies how necessary it is to build a stable relationship to get access to reliable information and have a chance to influence public policies. Daniel Guéguen identifies three different kinds of strategies used by lobbyists (Europa, 2011):

- Negative strategies consisting of a face-on opposition to Commission proposals or by proposing untenable counter-proposals; the farming lobbies provide the best illustration of these opposition strategies.
- Reactive strategies in which prudence prevails over action and initiatives: monitoring, meetings and a small amount of public relations.
- Pro-active strategies consisting of working constructively with the Commission in a spirit of partnership and credibility.

However, the growing numbers of lobby actors who gravitate around the EU institutions have made it a requirement to regulate lobbying. It is understandable that officials who cross the line of conflict of interest tarnish the reputation of the institutions. In spring 2011, the EU Parliament drafted a new code of conduct in order to avoid large scale scandals. The new code

aimed to tackle any kind of conflict of interest, bribery, and unfair practice by the member of the European Parliament (European Parliament, 2013). This measure came in response to a corruption case involving at least three MEPs in March 2011. The BBC reported that these MEPs were accused of accepting cash offers in exchange for influencing laws (Peter, 2011). Pressure groups have then been required to list themselves on a *Transparency Register* but it remains a voluntary action and it is not sure yet whether this measure will be efficient enough to regulate lobbying. There are several pressure groups that are recognized to be interested in the agricultural and environmental policies:

- *COPA-COGECA*: COPA, French acronym for *Committee of Professional Agricultural Organisations*, was created in September 1958 and it has been recognised since the very beginning by the Community authorities as the organisation that speaks on the behalf of the European agricultural sector as a whole. Today, COPA gathers 60 organisations from EU countries and 36 partner organisations from other European countries, such as Iceland, Norway, Switzerland, and Turkey. COGECA, French acronym for *General Committee for Agricultural Cooperation in the European Union*, is the European umbrella entity that regroups the national agricultural cooperative organisations. It was created in September 1959, shortly after COPA. Both organisations merged together in 1962 to become COPA-COGECA. Today, COGECA represents and defends the interests of around 40 000 farmers' cooperatives across the EU, employing around 600 000 people and with a global annual turnover of more than three hundred billion euro (COPA-COGECA, 2013). Since its creation, it officially represents the entire agricultural and fisheries cooperative sector.
- *IFOAM*: The *International Federation of Organic Agriculture Movements* was created in France in November 1972 by the French farmer organisation *Nature et Progrès* during an international congress on organic agriculture. The movement began with 5 founding members (from the United Kingdom, Sweden, South Africa, the United States, and France) and now consists of around 800 affiliates from across the world. IFOAM is the only international umbrella organisation representing the organic farming sector. The main goal of the movement is to lead, unite and assist the organic movement while it pushes for an ecologically, socially and economically sound practice of farming (IFOAM, 2013). In the mid 2000's, IFOAM EU was created with the aim to represent the interests of organic farmers within the European institutions. Actions at the European level range from shaping EU organic regulation, preventing

the acceptance of GMO trace in non-GMO seeds, avoiding an EU Ecolabel for food (source of confusion for consumers with the organic label), or founding a research and innovation platform, and obtaining official recognition(IFOAM, 2013).

- *European Environment Bureau*: Created in 1974 in Brussels, the European Environment Bureau (EEB) is the largest coalition of grassroots environment organisations in Europe and gathers over 140 environmental groups from the 28 member states and neighbouring countries. As a key player in the environment arena in Europe, the EEB focuses on influencing EU policymaking and the implementation of said policies, whilst also promoting the principles of prevention, precaution and polluter pays (European Environmental Bureau, 2013). Environment issues are discussed through several working groups, each of them focusing on specific aspects, such as agriculture, natural resources, biodiversity, chemicals, etc. The EEB working group on agriculture deals mainly with issues related to the CAP and to bioenergy.
- *FoodDrinkEurope*: Founded in 1982 under the name Confederation of Food and Drink Industries of the EEC by the Union of Industrial and Employers' Confederation of Europe (the industry lobby group), and renamed FoodDrinkEurope in 2011, the organization represents the interests of the food and drink industry sector at the European level. Agricultural raw materials are an essential part of the food processing industries and their costs can represent a large share (up to 80%) of the food and drink manufacturer's operating costs (Food Drink Europe, 2013).
- *BEUC*: acronym for French *Bureau Européen des Unions de Consommateurs*, the European Consumer Organisation is the umbrella group gathering 41 independent national consumer groups from 31 European countries in Brussels, with the task to represent and defend the interests of all Europe's consumers. BEUC was founded in March 1962 by the national consumer groups of the six founding EEC members. From a consumer point of view, the group advocates that the CAP addresses issues related to food: food security, food safety and quality, sustainable food, affordable food (Bureau Européen des Unions de Consommateurs, 2013).

4.3.5 EU Environmental legislation

There are various items of the EU environmental legislation which, although not addressing climate change directly, can contribute to mitigate greenhouse gases emissions from agriculture and favor environmental farming practices. As it has been briefly mentioned in the previous chapter, some legislations address the issue of water quality which is relevant to agriculture in terms of irrigation and the potential increase in droughts in some regions; the use of fertilizers has been regulated in order to mitigate GHGs; policies dealing with soils have been implemented in order to benefit from their capacity to help reducing GHGs. Integration through environmental legislation makes the case for the neofunctionalist theory which, as mentioned earlier in this research paper, argues that integration at the regional level in one sector can only work if it is combined with the regional integration of other sectors, as problems that can arise from the starting sector can be solved by the integration with other sectors. Integration in agriculture can only be complete if member states integrate in environmental areas, in order to ensure that the environment is protected from agricultural pressures.

4.3.5.1 The Nitrates Directive

Since agriculture was developed as a key component of the Community integration, the trend towards greater intensification and higher productivity has led to a significant increase in the use of both inorganic nitrogen and phosphorous fertilizers. The Nitrates Directive is a legislation passed in December 1991. It is one of the oldest environmental community legislations that member states had to implement in their national laws. The Directive aims to protect water quality across Europe by preventing nitrates (NO_3) from agricultural sources polluting ground and surface waters, and also to promote the use of good farming practices (European Commission, 2010: 1). It requires member states to identify waters with nitrate problems, as well as the contributing land source. Member states have to identify waters affected by nitrate pollution and those that could be affected if no preventive measures are taken. This identification of polluted waters is based on three criteria: whether surface freshwaters (in particular drinking water sources) contain more nitrates than the concentration allowed by law (50mg NO_3 /l of surface freshwaters, also referred to as 50mg/l of NO_3); whether groundwater contains more than 50mg/l of NO_3 ; and whether bodies of

water are eutrophic (Grossmann, 2000).⁵ To help with this identification, member states must monitor all surface and ground waters over a one year period. The European Commission compiles a report on the implementation of the Directive every four years, based on information from national authorities (starting in 2009 for EU-27). In 2009, there were 31 000 ground water sampling sites and 27 000 surface water stations in the EU, with Belgium, Denmark and Malta having the densest monitoring networks (European Commission, 2010: 2).

The Directive requires member states to designate *Nitrates Vulnerable Zones* (NVZs) as areas of land which drain into polluted waters or waters at risk of pollution and which contribute to nitrate pollution; or to choose to apply preventive measures to their whole territory (instead of designating NVZs) (European Commission - Environment, 2013). It establishes as well Codes of Good Agricultural Practices that farmers implement on a voluntary basis. These Codes include measures that limit the periods when nitrogen fertilizers can be used on land in order to target application to periods when crops require nitrogen and prevent nutrient losses to waters; measures that limit the conditions for fertilizers application (on steeply sloping ground, frozen or snow covered ground, close to water courses, etc) in order to prevent nitrate losses from leaching and run-off; requirements for a minimum storage capacity for livestock manure; and crop rotations, soil winter cover, and catch crops to prevent nitrate leaching and run off during wet seasons (European Commission - Environment, 2013).

Farmers are required to establish action programs within the NVZs on a compulsory basis. These programs include measures already set up in Codes of Good Agricultural Practices but they become compulsory in NVZs; and other measures such as limitation of fertilizer application (mineral and organic) for instance (European Commission - Environment, 2013). The Directive sets out a limit of 170kg nitrogen per hectare (ha) from livestock manure that can be applied across farmlands. However, it is possible to be granted derogations to go over this limit, under certain conditions. Member states have to demonstrate that they can meet the Directive's objectives by improving other measures and reducing nutrient losses in other ways, and they must provide solid justifications for their need to exceed the 170 kg nitrogen/ha (European Commission, 2010: 3). The Netherlands, Germany and Ireland had derogations until December 2013, Belgium (for the Flanders region) and the

⁵ Eutrophication occurs when high quantities of nutrients from sewage or fertilizers which contaminate water bodies. It results in an excessive increase of weeds and algae which choke and discolor waters, disrupting normal ecosystems and depriving fish of oxygen.

United Kingdom (for Northern Ireland) until December 2014 and Italy (northern regions) until December 2015. Some member states failed at time to comply with the Directive and were brought before the European court of Justice by the Commission, such as Portugal and Italy in 2003, or France in 2012. In the French case, the Commission argued that not enough has been done by the government to transpose the Directive into the national legislation, however measures passed to comply with Directive have been met with heavy opposition by French farmers resulting in strong protests in the streets of Paris in early 2013 as they perceived these environmental laws as a risk for the competitiveness of French agriculture (Trompiz, 2013).

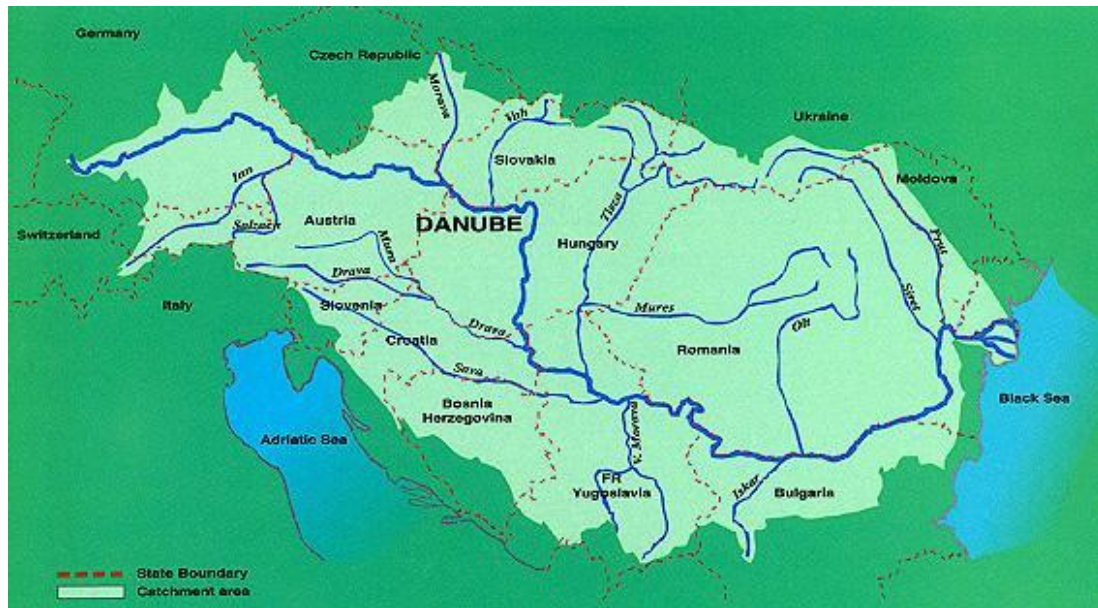
The Nitrates Directive has close ties with other EU policies regarding air, water, climate change and agriculture. The CAP works alongside the Directive through direct support (subject to cross compliance with other EU environmental legislations) and rural development measures (any agri-environmental measures for which farmers can receive payments); and if fully implemented, the Directive could help cutting N₂O emissions by 6% on 2000 levels by 2020 for example, therefore contributing to climate change mitigation (European Commission, 2010: 4).

4.3.5.2 The Water Framework Directive

Europe's water is under pressure: in fact, recent figures show that 60% of European cities over exploit their groundwater resources, 50% of wetlands are endangered, a fifth of all surface water are at serious risk from pollution, and almost half of Europeans live in "water stressed" countries (European Commission - Environment, 2010: 1). In 2000, the EU adopted a new environmental legislation aimed to manage and protect waters in Europe, the Water Framework Directive. The overall objective of the Directive is to create a framework for protecting all waters (surface water and groundwater), preventing further deterioration, protecting the status of ecosystems and wetlands, promoting sustainable water use, and contributing to mitigating the effects of floods and droughts (European Commission - Agriculture and Rural Development, 2008: 18). The Directive requires member states to identify river basins within their territory. A river basin covers the entire river system, from small tributaries at the source to the estuary, and includes groundwater. These river basins are

operated under River Basin Management Plans (reviewed every six years), ensuring that member states are responsible for their supervision and the coordination of all aspects of water management. There are currently 110 river basins districts, 40 of which are international and cross borders, covering around 60% of the EU territory (European Commission - Environment, 2010: 2). The *Salmon 2020* program in the Rhine basin is a successful example of international cooperation between six countries (Liechtenstein, Switzerland, Germany, France, Luxembourg, and the Netherlands). These countries are working together to re-introduce salmon, which died out in the 1950's from the Rhine River and, although the species is not yet independent from human intervention, the obtained results so far give hope that a "natural" salmon population may be achieved in the Rhine system by the year 2020 (International Commission for the Protection of the Rhine, 2013). The Danube river district is the largest basin in the EU, and it illustrates the variety of water in one basin: mountain streams from the Carpathians and the Alps, groundwater bodies, a large delta, and the Black Sea coastal waters. Fourteen countries are involved with the Danube and its tributaries, all of them signatories to the *International Commission for the Protection of the Danube River* (ICPDR), an international platform dedicated to enhance cooperation on matters regarding the Danube. It is under the supervision of the ICPDR from which the management plan is conducted. The plan focuses on the main trans-boundary problems that can directly or indirectly affect the quality of rivers and lakes as well as trans-boundary ground waters bodies, which are polluted by organic substance, nutrients, hazardous substances and hydro morphological alterations (International Commission for the Protection of the Danube River, 2013). Figure 7 shows the whole Danube basin district and therefore helps understanding the necessity for strong international cooperation for the protection of the water quality.

Figure 7 Danube basin, across several member states



Source: Ramsar Convention on Wetlands, 2002

Another goal addressed by the Directive is that EU waters achieve a good chemical and ecological status, both surface water and ground water by 2015. Good chemical status means that limits have been set on the concentration of certain pollutants, classified under *priority substances* (as of April 2013, 45 substances have been identified). These pollutants present are at high risk of finding their ways into European waters from point sources, such as waste waters from industrial buildings and from diffuse sources, such as pesticide runoff into waters from agricultural lands (European Commission - Environment, 2010: 1). Good ecological status stresses that member states need to address the factors harming water ecosystems, such as pollution or over extraction of water for irrigation purposes, which can reduce water levels of rivers at or below a critical point. (European Commission, 2010)

4.3.5.3 The Integrated Pollution Prevention and Control Directive

Under the Integrated Pollution Prevention and Control (IPPC) Directive (1996), the EU has defined obligations to which industrial and agricultural activities with a high pollution potential have to comply. After 2013, the *Industrial Emissions Directive* (2010) will come into force, merging together the IPPC Directive and other directives. However, the provisions enumerated in the IPPC Directive will remain unchanged. The Commission reviews member states reports based on a three year period. The IPPC Directive establishes a procedure for

authorizing these activities and requires that they get delivered a permit which can only be issued if certain environmental conditions are met, so that the companies themselves will bear responsibility for preventing and reducing any pollution they may cause (Europa, 2011). The Directive aims at preventing and reducing pollution of the atmosphere, water and soil, and to act on the quantities of wastes from industrial and agricultural installations.

In order to be granted a permit, there are certain basic obligations an industrial or agricultural installation must comply with, such as (Europa, 2011):

- Using all appropriate pollution-prevention measures, namely the *Best Available Techniques* (which produce the least waste, use less hazardous substances, etc.)
- Preventing all large scale pollution
- Preventing , recycling or disposing of waste in the least polluting way possible
- Using energy efficiently
- Returning sites to their original state when the activity is over.

Regarding agricultural installations, the Directive covers livestock with more than 2000 fattening pigs and/or more than 750 sows and/or more than 40 000 chickens. The main measures that need to be applied at these installations are directed at reducing ammonia emissions (such as covered storage of animal manure, improved housing system, manure handling and treatment, etc); despite ammonia not being a greenhouse gas, measures regarding manure treatment can influence methane and nitrous oxide emissions (European Commission - Agriculture and Rural Development, 2008: 18). In 2009, figures show that 14 member states had still not fully implemented the Directive, in particular France (72% of implementation), Greece (53%), Slovenia (41%); or Malta (38%)(Vertigo, 2010). These delays of implementation led the Commission to bring six member states (Denmark, Spain, Greece, The Netherlands, Portugal and Slovenia) before the European Court of Justice and to address a first formal written warning to France, Austria and France regarding 1700 installations being run without authorization(Vertigo, 2010).

4.3.5.4 National Emission Ceiling

As an integrated part of the EU's air quality policy, the National Emission Ceiling (NEC) Directive sets upper limits, to be reached by 2010. This applies to each member state for the total emissions of the four pollutants responsible for acidification, eutrophication and

ground-level ozone pollution (namely sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia), but member states are granted the freedom to decide which measures to take in order to comply (European Commission - Environment, 2012). Member states are required to draw up national plans to demonstrate how they expect to reach their goals. The Thematic Strategy on Air Pollution in 2005 identified several key measures that would need to be taken to help reach the EU 2020 strategy objectives for human health and environment. A revision of the NEC Directive is currently underway, and it will be based on official national projections of agricultural activities up to 2020 provided by member states, as required by the DG Environment of the European Commission. These projections should reflect national agricultural policies, and should include all necessary measures to comply with the Kyoto Protocol's targets on greenhouse gas emissions (assuming that the Kyoto cap remains unchanged) (Amman, et al., 2008: 15).

Among these four pollutants, the agricultural sector can be held responsible for the largest share of ammonia emissions. They are mainly due to livestock excreta, whether that occurs from livestock housing, manure storage, urine and dung deposition in grazed pastures or after manure spreading into land; whereas emissions in smaller amounts come from nitrogenous fertilizers and from fertilized crops (Eurostat, 2012). In 2010 in the EU-27, agriculture released 94% of all ammonia emissions and with the exception of Finland and Spain (which did not reach their national plans goals), the EU as a whole has met the NEC Directive emission ceiling target for ammonia; and in the period 1990-2010, emissions recorded a 30% decrease (Eurostat, 2012). Figures vary greatly from one member state to another, for instance, the Netherlands (-68%), Latvia (-66%), Bulgaria (-66%) and Lithuania (-64%) reporting the largest decrease and in contrast, Spain (+15%) and Cyprus (+0.1%) have seen their ammonia emission from agriculture increase (Eurostat, 2012).

4.3.5.5 Going toward a Soil Framework Directive?

As of today, there are still no defined EU legislations that deal exclusively with the issue of soil. Various EU policies (for instance on water, chemicals, nature protection, agriculture, etc.) contribute indirectly to soil protection but because these policies have other aims and scopes of action, they do not provide a sufficient and adequate level of protection for all soil in Europe (European Commission - Environment, 2012). In agriculture, soil degradation can be caused by inappropriate farming practices such as unbalanced fertilization,

excessive use of groundwater for irrigation purposes, misuse of pesticides, use of heavy machinery or overgrazing; and with the implementation of agro-environment measures through the CAP, new opportunities are opened to prevent and mitigate soil degradation by favouring the build-up of soil organic matter and enhancing soil biodiversity (European Commission - Agriculture and Rural Development, 2012). The cross compliance principle (linking direct payment to farmers to the application of good agricultural practices) can provide some benefits, but these measures are not compulsory everywhere and they only apply to farmers that receive payments from the CAP (which is not the case of all type of farming activities), plus farmers who do not receive payments are not under the obligation to adopt “soil-friendly” practices (Europa, 2006).

On 22 September 2006, the Commission adopted a *Soil Thematic Strategy* and a proposal for a *Soil Framework Directive* with the objective to protect soils across Europe. The Strategy has been adopted in 2007 whereas the Directive is still in its proposal stage. It is subject to the co-decision procedure; and despite the fact that the Committee of the Regions, the European Economic and Social Committee and the European Parliament have agreed on the proposal, the Council has so far been unable to reach a qualified majority due to the opposition of a number of member states forming a blocking minority (European Commission - Agriculture and Rural Development, 2012).

4.4 Concluding remarks

The CAP has been one of the earliest policies to promote regional integration and even though it was created to satisfy one member state’s own national interests, it resulted to be beneficial for farmers and the rural areas across the EU. In its attempt to tackle environmental issues and climate change, the Commission has proposed three measures that would provide solutions for farmers to reach the expected results. Crop diversification has the ambition to make farms with monoculture more sustainable and environmentally friendly; the requirement that farmers maintain permanent grassland is intended to ensure the grassland is not moved around, which could result in increased GHG emissions and nutrient release; and under the ecological focus areas proposal farmers with arable land should devote a certain amount of land to terraces, landscape features, fallow, buffer stripes and afforested areas, which in turn will increase the environmental benefit of the land. The Commission has chosen to address the climate change issue by targeting land management. As findings of the previous chapter

have pointed out, agriculture can reduce its GHG emissions and participate to mitigate climate change effects if sustainable farming practices are applied to the land, which would result in the soil capturing carbon release. And with the help of other items of the EU environmental legislation, greater benefits could possibly be achieved. Protecting waters in irrigated areas from agricultural pressures, limiting the amount of nitrate release in the air through the use fertilizers, or adopting legislation for soil protection are steps that are necessary to incite farmers to adopt environmentally good agricultural practices.

5 A Reform lacking ambition?

In April 2010, Commissioner Cioloş launched a public debate on the CAP's future and its contribution to the Europe 2020 strategy. By the end of the year, the Commission presented its Communication on *The CAP towards 2020*, which was the ground step to the debate with other institutions and with stakeholders. The legal proposals for a more effective CAP making European agriculture more competitive and sustainable were presented by the Commission in October 2011. This led to almost two years of negotiations with the Council and the European Parliament. Finally in June 2013 a political agreement on the reform of the CAP was reached. One target of the Europe 2020 Strategy is to tackle climate change and develop sustainable energies. Reducing the greenhouse gas emissions by 20 % to 1990 levels is the main aspect of this target, and reforming the CAP comes within the scope of it as a way to reduce emissions from agriculture. During his first trip as Commissioner for Agriculture in February 2010 in Spain, the member state that was holding the Council presidency at the time, Dacian Cioloş expressed his desire to see European agriculture clearly take into account environment and climate change. The proposals he later on put forward for the reform emphasized greening measures necessary to reach the target. Linking farmers' subsidies to environmentally friendly agricultural practices (crop diversification, maintaining permanent pastures, maintaining an "ecological focus area") are considered to be the solution to give an incentive to farmers to play their role in reducing agricultural greenhouse gas emissions. The question this chapter intends to ask is whether the proposed reform of the CAP can therefore be an effective tool to combat climate change or not. Are all the actors involved with this reform satisfied by the presented results? Due to the diversity of parties involved, one could possibly argue that the reform could fail to deliver the expected results. It is not unreasonable to believe that farmers' interests may conflict with those of environmental groups.

5.1 *The farming sector's response*

The farming sector is with no doubt the sector that has more stakes in the CAP. Its voice inevitably carries more weight compared to other parties that can claim an interest in farming policies. The CAP reform released by the Commission was met with strong criticism and scepticism by the farming sector for various reasons. EU farmers are worried that the

legislative proposals would undermine the competitiveness and the efficiency of the agri-food sector and achieve sustainable growth. The EU farming sector has shown concern with the greening measures the Commission has proposed as they consider these measures to be more damaging for farmers than having any environmental benefit. COPA-COGECA agrees to the necessity of a greener agriculture in the EU, but it has called for solutions “which enable farmers to contribute to a better environment while having a positive impact on their productivity and profitability.(COPA-COGECA, 2013: 3)” The organisation believes that the agricultural sector will face two major challenges in the coming years: the need to ensure food security in the face of rising global demand, shortage of resources of land and water and climate change; the need to contribute to economic growth and employment in particular in rural areas. However, the mandatory greening measures might not deliver the expected results says the COPA-COGECA.

On the Commission’s proposal to apply a crop diversification system on farm lands EU farmers argue that it will prove ineffective to impose the same requirements on over 12 million farms across the EU with very diverse situations. Growing more than 2 crops can prove to be very difficult for many farmers due to climatic or agronomic reasons; as a result, small-sized farms, livestock producers and specialized producers might find it particularly difficult to meet such requirement, and be penalised for failing to comply with it (COPA-COGECA, 2013: 6). In this case, a CAP that lacks flexibility could potentially have adverse effects on its goal if it fails to acknowledge the diversity of the European farming sector. Another element of the reform that COPA-COGECA argues, that the rigidity of the CAP will turn to be harmful for farmers, is related to the maintaining of permanent grasslands. Farmers need flexibility to take into account weather conditions and to meet their own food requirements; so, considering that the availability of arable land (which is in most of the case very fertile land) is declining across the Europe, EU farmers believe such measure will be counterproductive to farming practice (COPA-COGECA, 2013: 6). Copa-Cogeca expresses concern with the requirement of maintaining ecological focus areas on as much as 7% of each farm land. It believes that such measure is not going toward the right direction for farm production in a time when global food demand is rising and governments are pushing for a more bio-based economy (increase of bio-energy and use of renewables) (COPA-COGECA, 2013: 6). In response to these legislative proposals, COPA-COGECA advocated several measures that would ensure green growth, as well as increasing productivity (COPA-COGECA, 2013: 6): Integrating environmental protection and the production process in a way which maintains production capacity and contributes to efficiency, productivity and

innovation; establishing a EU list of measures that farmers could choose to apply in accordance with their own farm situation (some farmers may already have applied for some measures and this should be recognised); funding from Pillar 1 used to promote these measures should be much less than the 30% as proposed by the Commission.

Organic farming in the EU is relatively small compared to traditional farming; however it's rising in size. The organic sector amounted to an estimated 7,6 Mio ha in 2008, representing 4,3% of EU-27 utilised agricultural areas; and in the period 2000-2008 the average rate of growth was 6,7% in the EU-15 and 20% in the EU-12, with 197 000 holdings involved in organic agriculture (1,4% of all EU-27 holdings) (European Commission - Agriculture and Rural Development, 2010: 11). As a growing sector, organic farmers naturally claim an interest in the CAP reform. The IFOAM EU Group reacted to the legislative proposals in a position paper where it states its priorities regarding the new farming policy. Among these priorities, it advocates that the new CAP should respond to the environmental challenges that the EU will face such as degradation of natural resources and climate change, which are detrimental to food security; as well as ensuring biodiversity and help farmers to adapt their practices to the consequences and contribute to the mitigation of climate change (IFOAM, 2010: 4). The organisation acknowledges that the Commission made attempts to provide a green component to its reform but they are still too close to the "old" CAP logic and therefore the organic farming sector would welcome some changes.

Instead of solely using crop diversification as proposed by the Commission, IFOAM EU argues it would be more efficient to implement a crop rotation as well. If implemented in an appropriate manner, crop rotation can increase organic matter in the soil, improve soil structure and reduce soil degradation; moreover, crop rotation can effectively deliver on climate change mitigation (APRODEV, 2012: 2). In order to benefit from crop rotation, the organisation advocates that farmers grow crops that are biologically diverse (for example cereals, legumes, oilseeds, and root crops); and include a nitrogen-fixing legume crop as it helps improving soil, sequester carbon and reduce soil cultivation (APRODEV, 2012: 3). IFOAM EU recommends that the reform should set a maximum of 50% of the arable area to be cultivated with one crop, as opposed to the 70% proposed by the Commission, and that a minimum of 15% of the arable land should be dedicated to a nitrogen-fixing legume crops (APRODEV, 2012: 3). Regarding the ecological focus areas (EFA), the organisation argues that potential benefits would happen if quality and location of these areas were taken into

account instead of their size, as the Commission proposal focuses on. It recommends that as well making sure that when mixed farms (agrarian system that combines arable farming with the raising of livestock) have many areas that qualify as EFA, farmers should get rewarded for them, as well as including permanent pastures if the livestock density remains under set limit (IFOAM, 2010: 14). Such a recommendation comes in response to the amendments passed by the Agricultural Council and the COMAGRI “which have removed all potential links between getting the Basic Payment and complying with the requirements of EFA (Bureau, 2013).” IFOAM EU welcome the intention to protect permanent grassland as an environmental measure, but the main issue resides in the definition of said permanent grassland as it currently does not take into account the large diversity of different grasslands. It recommends that the protection of historically un-ploughed grassland and high nature value grassland should be mandatory with no reduction permitted under any circumstances (IFOAM, 2010: 15).

The overall feeling left by the present reform is that the farming sector is not convinced the expected results, in terms of environment and climate change mitigation, will be delivered. Traditional farmers and organic farmers share a common goal of production of agricultural goods but they largely differ in their priorities. As it has been mentioned so far, traditional farmers, through Copa-Cogeca, are far more concerned in keeping their productivity to levels that can secure them a solid source of revenue, as well as fulfilling the objective to answer to the rising global food demand. It would be hard to argue against such an ambition; however the feeling left by the farmers’ response to the legislative proposals from the Commission is that it might come at the expense of environmental measures. Where the Commission intended to set binding rules, the farmers expressed their wish for more flexibility in complying with these rules. Organic farmers found themselves on the other end of the spectrum, as they felt unsatisfied with the lack of ambition of the reform regarding environmental measures. They advocated stricter measures to be implemented in order to produce the environmental results the Commission expected from the reform, however, it can be argued that due to the relative small size of the organic sector in the EU organic farmers voice might not resonate as loud as traditional farming actors may do. A positive aspect that the organic sector could keep in mind for the future could lie in the acknowledgement of the Commission that agriculture needs to evolve into a more environmentally friendly sector.

5.2 Environmental groups' position

There are many similarities between the position of organic farmers and environmental actors in regards of the CAP reform, as might testify the common reform proposal they released in June 2012, following the discussion in the Council on greening the CAP.

Many of the arguments the environmental NGO's put forward about the CAP reform have already been stated in the section dealing with IFOAM EU's response to the legislative proposals and therefore it would be unnecessary to develop them again here. However, it is worth mentioning that "environmental and organic farming NGOs welcome the Commission's focus on the delivery of environmental public goods through greening the CAP and its intention to re-integrate diversity in the farming sector (European Environmental Bureau, 2011: 1)." They have raised concern for a scheme that would allow member states to re-introduce production subsidies to certain sectors without any link to the delivery of public goods. It could potentially harm some aims of the policy in tackling cross border issues such as climate change, biodiversity or level up differences between farmers across the EU (European Environmental Bureau, 2011: 2). Another blow to this reform is the lack of binding agri-environmental schemes, which environmental groups consider they should backbone of the whole CAP in order to make it more sustainable. Without these schemes, the CAP loses of its potential to fight climate change, in particular when agriculture can be held responsible for around 9% of the EU's total greenhouse gas emissions, due to current agricultural practices (European Environmental Bureau, 2011: 2).

5.3 The business industry's response

European food and drink industries claim a particular interest in the CAP mainly because of their needs in agricultural goods for their business. Although FoodDrinkEurope has welcomed the Commission's approach regarding the challenges of food security, environment and climate change, and territorial balance, it remains concerned that food security might not be sufficiently addressed. The group believes that the main priority of the EU agricultural policy should be to ensure sustainable agricultural production which in turn will help secure food production (FoodDrinkEurope, 2011: 1). The greening of the CAP raises worries among the sector: on the one hand its members fear that the environmental measures the Commission wants to implement could have an impact on the supply of raw

materials and therefore, limit the availability of sufficient quantities of raw materials; and on the other hand, there is a strong scepticism among the food and drink sector that the requirements on EFAs, the diversification of crops and the maintenance of permanent grassland will not deliver the environmental benefits, and that there is a lack of sound scientific evidence that evidence the need to implement these measures (FoodDrinkEurope, 2011: 2).

This position cannot come as a surprise as the sector is clearly production driven. Nor it can be considered unexpected that the food and drink industries would share some common views with the farming sector in particular when it comes to environmental aspects of agriculture. Competitiveness being among the top priorities for FoodDrinkEurope, the group fears that environmental measures farmers must comply with could potentially increase the price of raw agricultural goods, and therefore, be detrimental to the sector. The argument that the European food and drink industry plays a vital role in the European economy is very convincing for policymakers in particular when many of these jobs are located in rural areas, where economic opportunities might be limited. As a matter of fact, the industry (comprising around 300 000 companies) is the first manufacturing industry in the EU, providing jobs to 4.2 million people across the EU (FoodDrinkEurope, 2011: 1).

5.4 EU consumers' position

Consumers in the EU, says BEUC, have laid their focus on issues that are related to food: food security, food safety and quality, sustainable food, affordable food. The CAP reform cannot overlook these aspects as consumers are the ending line of the agriculture process. These expectations are legitimate in the sense that production must match consumers' needs and wishes and therefore, the EU should shift its agricultural policy to a food policy (BEUC, 2010: 2). BEUC agrees that the CAP should focus on tackling issues such as climate change but it could be more efficient if tackled via a more consumer-focused strategy rather than a producer-driven policy (BEUC, 2010: 3). Access to sustainable food should be guaranteed; in particular consumers have more and more expectations regarding information about production methods and their impact on the environment. BEUC believes that the CAP should encourage agricultural good practices as well as support organic agriculture, in order to achieve its goal in combating climate change (BEUC, 2010: 5).

It has been mentioned further above that all the parties involved in the CAP reform could have opposite priorities on which to focus, but the Commission has successfully managed to unite all these parties against itself by not releasing a convincing legislative proposal. The difficult task the Commission had to face when drafting its proposal is with no doubt how to council agricultural production with measures to protect the environment. The majority of the traditional farming sector in the EU has often been against environmental measures imposed by the EU's executive branch due to heavy regulations. In January 2013, while the CAP reform was still being discussed within the European institutions, French farmers had taken into the streets of Paris in protest against measures proposed by the French government to comply to a long-standing dispute over France's failure to meet water quality targets under the Nitrate Directive back in 1991 (Trompiz, 2013). They argued that the competitiveness of the French farming sector was under threat if farmers were required to follow the directive. In December 2013, farmers' leaders in the United Kingdom had been protesting to ministers not to implement plans to cut subsidies by 15% and transfer cash to wildlife protection in England and Wales (Harrabin, 2013). The National Farmers Union believed such a move would disadvantage British farmers, as in other: The CAP reform would impose a maximum allowable (15%) that could be shifted away from direct payment to farmers for environmental purposes, but the National Farmers Union believed that using the total amount that could be transferred would disadvantage British farmers against other farmers in the EU not subject to such a large cut. And it seems very plausible that similar issues between farmers and environmentalists could be found in other member states. The key message that farmers send to the Commission is that the implementation of climate change policies must not jeopardize the economic viability or the competitiveness of agricultural activities (COPA-COGECA, 2010: 1). The widespread fear among EU farmers is that complying with tight environmental rules would set an increase in agricultural goods prices and erode their competitiveness in particular against non-EU farmers that do not have to fulfil environmental requirements. Competitiveness is among the top priorities for the farming sector. The food and drink industry and the consumers rely on fair agricultural prices and market deregulation which implies that cheaper goods are becoming more and more available. The part of the business sector that deals with agricultural goods is also very reliant on affordable agricultural raw materials in order to offer affordable goods to consumers.

5.5 Other voices critical of the reform

Criticisms have risen as well within the civil society and among experts about the real environmental benefits the reform would bring. Crop diversification, permanent grasslands, and ecological focus areas may not deliver the result anticipated by the Commission. The Netherlands Environmental Assessment Agency (NEAA), which advises the Dutch government in matters of environment, nature and spatial planning, has been far from convinced about the reform. The impact of the crop diversification has been analysed as being limited. Most of the European farmers already apply 3 crops as a farm requirement; therefore the proposal may only impact 2% of EU arable land, and it will only affect areas where monoculture is predominant (Westhoek, et al., 2012: 10). In some parts of the EU, agriculture is strongly linked with the emergence of renewable energies such as Northern Germany where the landscape has been predominantly changed into exclusively corn fields. That is for answering the needs of the growing biogas energy industry, which has a very high demand for crop production; therefore it does not leave much room for farming any other kind of crop in the region (Klawitter, 2012). Crop diversification, as engineered by the Commission, will not have major impact in the EU as a whole, since only a very little part of the territory will be subject to such measure; and it is easy to believe that effects on greenhouse gases will be very limited. The rationale behind the maintaining of permanent grassland measure was that it would limit a potential massive conversion of arable land, and in return may have positive environmental effects. The NEAA estimates that it will not be an easy task to assess the amount of their permanent grassland farmers will preserve; and with the main purpose of the greening measures being to reduce GHGs emissions, it should be noted that these emissions mainly come from livestock farming activities and not from changes in land use (Westhoek, et al., 2012: 4). The effects of ecological focus areas will very likely depend on their design. If they are implemented as buffer strip (area of land maintained in permanent vegetation), they will provide clear environmental advantages, such as reducing the run-off and the leaching of pesticides and nutrients into surface waters; and they could also lead to a reduction of GHGs emissions due to the decreased use of fertilizers (Westhoek, et al., 2012: 3). If lowering the use of fertilizers will in consequence mean a decrease in agricultural production in the EU, it is worth to point out that an increase of agricultural imports might be inevitable to sustain the EU's needs and therefore the risk of increasing GHGs emissions outside the Community becomes a serious possibility. Such a scenario could counterbalance the benefits of such green measure.

5.6 Vote in the EU Parliament

With their new power conferred by the Lisbon Treaty, the MEPs have had an important role to play in shaping the CAP. From a consultative body in the policy-making they became an actor the Commission and the Council had to reckon with during the negotiations on the reform. The main parties in the Parliament namely the European People's Party (EPP), the Progressive Alliance of Socialists and Democrats (S&D), the Alliance of Liberals and Democrats for Europe (ALDE), the Greens-European Free Alliance (Greens-EFA) and the European Conservatives and Reformists (ECA) have their respective agendas regarding agriculture, at times very closely related to the lobby groups. As such, the EPP and the ECA have been in favour of increasing production and emphasized the need for a competitive agricultural sector in the EU, the S&D has set its focus on a fairer redistribution of the CAP funds, the ALDE has been keen on having a CAP exempt of market regulation, and the Greens-EFA have pushed for more environmental measures. Every political group agreed on the necessity for the agricultural sector to become greener and more sustainable, but there is sometimes a gap between the intentions and the actions undertaken.

Two episodes at the EP could be defined as key elements to answer the question if the new CAP can help fight climate change. One is the result of the COMAGRI vote in January 2013. It has been met with strong criticism in particular from environmental groups which accused the committee to have watered down most of the environmental measures from the Commission's reform. Among these was the requirement for farmers to apply the three green measures brought forward in the reform (EFA, crop diversification, and permanent grassland) in order to receive the basic direct payments. The COMAGRI voted in favour of not linking these measures to any direct payment, which would mean that in case of non-compliance with the green measures, farmers would only forfeit the green payments, and therefore make these green measures optional for farmers (CAP2020, 2013). To understand where all this criticism is coming from it could be interesting to give some details about how the Agricultural Committee works. Traditionally, the COMAGRI was composed of members that had strong links with the agricultural sector, whether they came from the national political scene, the agro-business industry, farm unions or the farming sector itself; and the current committee does not exempt to the rule (Swinnen & Knops, 2012: 2). On the one hand it might not be a completely bad idea that those in charge in shaping a farm bill have a solid background in

agriculture issues, but on the other hand a diversity of profiles sitting at the committee could be beneficial for providing “outsider” views on the matters. The COMAGRI reputation for being a “conservative forum” where agricultural interests are defended will not be challenged, and progressive ideas that could be necessary to reform the CAP are unlikely to come out from there (Swinnen & Knops, 2012: 3). The distribution of the internal reports is a clear illustration of the conservatism of the committee as out of seven reports none have been designated to any members of the Liberal or Green groups, which are to some extent the more progressive forces in the EP. The second episode of the CAP reform at the EP took place during the plenary session in March 2013, when all MEP’s were invited to vote for or reject the proposed position from the agriculture committee as their negotiating mandate on the CAP reform. Overall, they largely agreed on the amendment passed in the COMAGRI earlier that year, although MEPs have overturned some key decisions which were going against possible environmental benefits (WWF, 2013). It has been seen as a disappointment by most of the environment stakeholders that the plenary session voted in favour of separating basic payments and the penalty for non-complying with the green measures, as agreed in the agriculture committee, but as a victory that the MEPs overturned a COMAGRI amendment that would allow farmers to receive double funding for green payments and payments for agri-environment-climate measures (funded in Pillar 2 of the CAP) (CAP2020, 2013). The EU rules regarding public expenditures states that no costs for the same activity can be funded twice from the EU budget. If passed, such an amendment could have been difficult to justify to the general public as it could have been viewed as a waste of public money.

The general agreement over the reform of the CAP was concluded in a three-way negotiation between the EC, the Agriculture Council and the EP in June 2013, while some issues that could not be agreed on at that time were finalised by the end of the year. In terms of greening, the end product of the CAP is not as convincing as the Commission’s proposal was planning to be. The general agreement can be described as follows: added to the Basic Payment Scheme, each holding that respects certain agricultural practices that provide benefits for the climate and the environment is entitled to green payments. These payments are financed by the member states, which are required to use 30% of their CAP budget for this purpose. This is a compulsory measure and failure to comply with these Greening requirements result in penalties that can go beyond the Greening payments. The Tri-parties have agreed to (Europa, 2013):

- The maintaining a ratio of permanent grassland at national, regional or farm level;

- The crop diversification: 2 crops at least must be cultivated if the arable land exceeds 10 hectares and at least 3 crops if the arable land exceeds 30 hectares; with the main crop covering at most 75% of that land, and the two main crops at most 95% of the land.
- The maintaining of EFAs of at least 5% of the arable area of the holding for farms with an area exceeding 15 hectares. That figure will rise to 7% after a Commission report in 2017 and a legislative proposal.

In order to ease the fears of those already applying environmental and sustainable farming practices, the reform sets up a Greening equivalency system which consists in acknowledging these beneficial practices and entitles farmers to be exempt from the basic green requirements. This measure is mainly directed to organic farmers which farming practices are shown to provide clear ecological effects (Europa, 2013).

5.7 Concluding remarks: A CAP not good enough

The Commission's proposal for greening the CAP has brought into light the cleavage there is between the farming and agro business sector on the one hand; and the environmentally friendly stakeholders on the other hand. Although both groups agree on paper that the environment needs to be protected in order to make the European agriculture more sustainable. Solutions brought forward to reach that target are so opposed to each other that it seems hardly feasible that the reform could possibly make anyone happy. The CAP is traditionally a hot topic politically speaking within the European institutions and the member states. When Commissioner Cioloş presented his proposals for the new CAP, he knew he would be swimming in troubled waters, in particular if one considers that member states among themselves may have opposing expectations with the EU farming legislation. Battle of views regarding the budget that should be allocated to the CAP, market regulations are among the issues that arise during EU meetings.

First, in order to make EU agriculture meet its target of reducing its greenhouse gas emissions, implementing greening measures could seem a necessity. Not only the greening of agriculture has been integrated into the wider EU strategy for mitigating climate change effects, there has also been strong expectation among the EU society for more environmentally oriented farming as the public debates launched by the Commission have shown (European Environmental Bureau, 2013: 4). EU consumers are more and more

concerned about the quality and how their food is being produced; therefore the new CAP could not ignore this growing trend. However, the political will for a strong green CAP is still clearly missing within the European institutions. The political spectrum in the EP and among EU leaders does not make it favorable for environmentalists to be heard. As a matter of fact, during the three-day meeting between the Commission, the EP and the Agriculture Council, no environmental interests were actually represented and to some extent, green groups had no other choice than defending the Commission's proposal, as it was their best solution to have some greening measures going through the negotiations (Matthews, 2013). In addition, although they view it as a step toward the right direction, green groups were not satisfied with the proposal because they believed it was not going far enough. Farming interests have been, on the opposite, well protected within the institutions. As it has been mentioned earlier in this paper, COMAGRI has acted well in defending of the farming sector, even voting some controversial amendments to be overturned in plenary session. Farmers have traditionally been in close links with right wing political groups, both at the national and the EU levels, and with the small number of green MEPs sitting both in the COMAGRI and the EP it would have needed a very strong political will from MEPs from all colors to form a coalition to push for stronger environmental measures.

Secondly, when in April 2010 Commissioner Ciolos launched a 3-month public consultation, inviting any interested EU citizens and organisations (whether or not involved in agriculture) to debate over the future of the CAP, his Directorate General received more than 5500 contributions coming from the general public, stakeholders, and think tanks (European Commission, 2013). The intention of this consultation was to give as many interested parties as possible the chance to have their say in the early stage of the CAP policymaking, helping the legislator to target as closely as possible the expectations of the EU citizens and organisations. In any given field policy making stakeholders always play a strong part in the process, and with a large portion of the EU budget allocated to the CAP it makes the agriculture bill a very important area to influence. Lobbying activities can be divided in two groups: on the one hand there is the influential farmers lobby group (namely COPA-COGECA) assisted by the agribusiness pressure groups, and on the other hand there are all the environmental organisations and to some extent the organic farmers. This is a battle between two opposite groups where the main weapons are influence and resources, and so far the environmentalists have always been outnumbered. One can say that COPA-COGECA is the influence arm within the EU institution for the farmers whereas the agribusiness sector provides the resources (substantial financial resources) in this fight. A look at the structure of

the 30 Advisory Groups in the DG AGRI illustrates very well the influential position of the farmers' group: around 80% of the members come from large farming organisations and the food industry; and out 943 seats, 29 have gone to small-scale or organic farming, 38 to consumer groups, 36 to environmental groups, while COPA-COGECA enjoys 442 seats (Corporate Europe Observatory, 2014). Such a disproportionate number of seats between farmers and environmentalists within the institution that is responsible for drafting the CAP highlight the fact the green groups need to coordinate their efforts with other forces, consumer groups for instance. When it comes to resources spent in lobbying activities, environmental groups are not in a much better position. In fact, in 2011, 151 organizations listed as representing agribusiness interests declared a total of 49,2 million euro in lobbying spending while 40 organizations representing family farms, workers, consumers and environmental interests declared around 12 million euro in expenditures, making a ratio of slightly over 4:1 (Corporate Europe Observatory, 2012). The smaller is your capacity and your resources, the more important it is to target the policies that are vital for your interests, and that is the position environmental groups and small farm business are in compared to the agribusiness sector.

Thirdly, promoting environmental measures at the EU level, and more generally at the global level, will always face opposition of those economic forces whose interests might be hampered if these measures are implemented. Environmental groups should take as good news the large selection of environmental legislations the EU as passed over the last decade, although some will argue that they do not go far enough. However, the EU Climate strategy after 2020, which is by far currently the world's most ambitious plan to mitigate climate change and tackle greenhouse gases emissions, is a clear commitment that environment is on the EU's agenda for the next decades. Every sector, in particular the industry and the transport, of the EU economy will be asked to play its share, as should agriculture. The question that may rise in the future could be the compatibility between the CAP and environmental legislations. On the paper, farmers have a lot to gain from complying with tighter measures to protect the environment but as it has been demonstrated earlier, that would come at a financial cost that not everybody is willing to pay. There is no doubt it is less risky politically for the legislator to stop consumers from using energy-demanding light bulbs than banning the use of pesticides in farming for instance. The most relevant example lies in the ongoing failure of France to adapt the 1991 Nitrates Directive to its national legislation (Radisson, 2014) which is easily explained by intensive farmers groups' pressures; and although DG Agriculture and the agriculture section of DG Environment are supposed to be

working together, it is not sure they share the same priorities. In other words, it is not an easy task to make farmers shift from traditional agricultural practices to more sustainable farming techniques that may involve higher costs. Organic farmers have taken the step in that direction, facing the risk of uncertainties over the future of organic demand from consumers. Theoretically speaking, the CAP should push toward a greater symbiosis between traditional farming and organic farming if it wants to deliver positive results in terms of fighting climate change. Organic farming is highly recognized around the world for reducing non-renewable energy use due to decreased need for agrochemicals, for contributing to mitigate GHGs emissions through its ability to sequester carbon in soil, and several farming practices increase the return of carbon to the soil, which in return can raise productivity and help carbon storage (Food and Agriculture Organisation, 2011). It is not, however, possible to turn every traditional farmer into an organic farmer, and the question that the CAP cannot overlook is whether or not EU agriculture can deliver results on food security. As of today, there is no comprehensive data about the ability of organic farming to provide food on a large scale. Available figures regarding organic agriculture show an increase of land cultivated in the last decade (from 5.7 million hectares in 2002 up to 9.6 million hectares in 2011, increasing by about 500 000 hectares each year) (European Commission, 2014). Rising demand for organic products might help farmers to embrace organic farming practices, which in turn can only have positive effects for the environment. However, the higher production costs of organic agriculture currently act as a deterrent for many of them, and since the majority of the EU consumers is not ready yet or cannot simply afford the price of organic agricultural products, traditional farming has still a long future ahead.

6 Conclusion

Climate change is today widely acknowledged by experts, decision makers and the general public, but the scientific community is yet to speak with one voice. As an open air activity, agriculture has two challenges to overcome: as an emitter of greenhouse gases, it needs to reduce its farming emissions; and because it is directly exposed to changing climatic conditions, the necessity to adapt to their effects is much stronger than in many other economic areas, such as industry or transport. This research paper has sought to explore the question: Is the CAP capable in helping mitigating climate change effects on the EU agriculture. Farmers cannot operate without a legislative framework that coordinates their actions if environmental results are to be expected from agricultural activities.

This paper is based on the theoretical ground of European integration, which helps to explain how actions are decided at the EU level. In the battle of influence between European institutions, the CAP is a policy that remains strongly decided by member states and the outcomes of the reforms vary rarely from their expectation. The Council serves as the institutional forum where member states decide a common position to adopt prior to the discussions with the Commission and the Parliament. As predicted by liberal intergovernmentalism, member states set their preferences on issues under the pressures of stakeholders, and seek to bargain these preferences in order to get the best outcomes possible. Member states where farmers' unions are strong are very likely to push for a common position that reflects these unions' expectations. That underlines the reasons why some propositions in the Commission's proposal were revised during the trialogue, such as the requirement on ecological focus areas. Moravcsik argues that states to be the main actors in the European integration process, which further raises the case that although the CAP is now under the co decision method, the Council remains the main player to take decisions, leaving behind the Commission in its role to propose legislations. EU integration theories can also explain the more and more predominant role of the EU environmental legislation. Environmental benefits cannot be achieved if member states do not perform certain tasks under a coordinated action. According to neofunctionalism, problems arising from the functional integration of one task can only be solved by integrating yet more tasks. Integrated green measures under the CAP cannot be efficient if member states do not integrate under other areas of environmental policy, such as soil and land use. Neofunctionalists stress out the role of supranational institutions, as better common outcomes can be performed under their

leadership, in particular because their position keeps them away from national influences. This puts the Commission in the driver seat to push for stronger environmental integration. Its central role in the European setting gives the Commission a privileged position to influence contacts between member states or interests groups, and therefore helps develop European integration. According to neofunctionalists, the outcome of intergovernmental decision making is characterized by the lowest common denominator among the parties, which means that the outcomes are usually closer to the least cooperative parties' position than to those who have more to gain from cooperation.

The first hypothesis in this research paper claimed that climate change would affect EU agriculture. The objective was to provide a comprehensive study of the challenges climate change will be for agriculture, and among these, identify the nature of greenhouse gas emissions from the EU agriculture sector. Rising temperatures are today an undisputed fact with effects that are widespread all over the globe. Greenhouse gases emissions have been identified as being responsible for the climate warming and predictions anticipate they will continue to grow if nothing is done to curb the trend. Findings have demonstrated that effects of climate change will be distributed across the EU but will materialize in several forms. While the southern regions will be hit by droughts and heat waves which will put pressure on water resources, the northern, central and eastern regions will face more frequent weather hazards such as heavy rain falls and floods. Although dependent on climatic conditions, there are agricultural methods that can mitigate these effects, such as sustainable farming practices. Efficient solutions need to be explored in order to cope with the effect of the changing climate.

The second hypothesis of the paper discussed the necessity for the agricultural sector to be backed by efficient EU legislations to adapt to climate change. To understand the current legislative framework that regulates agricultural activity and the environmental obligations that farmers must comply with is necessary to be able to assess the chance of success of the reform. The reform aimed to provide an answer to the challenges agriculture will face, many of which are driven by external factors and this translates into three objectives: food safety, sustainable management of natural resources and climate action, and territorial development. Under the name of Green Payment, the Commission proposed to link financial support to farmers to the fulfilment of greening measures in order to push them to reach the environmental objectives of the reform. There are three green measures in the reform proposal: *crop diversification*, *retaining permanent grasslands*, and *ecological focus*

areas. Crop diversification aims to tackle the issue of farms where monoculture prevails. Depending on the size of the farm, farmers are required to cultivate a minimum of two different crops on their holding. Permanent grassland is considered to be a land used to grow grasses or other herbaceous forage naturally or through cultivation and that has not been included in the crop rotation of the holding for five years or longer. The Commission proposed that arable farmlands across the EU should identify Ecological Focus Areas (EFAs) on 7% of their land. It means that farmers should devote that amount of land to terraces, landscape features, fallow, buffer stripes and afforested areas, for example. The findings also demonstrated that agriculture could benefit from other pieces of the EU environmental legislation in order to ease the environmental pressures stemming from agriculture. It led to the creation of legislations dedicated to protect, preserve and improve the quality of water (Water framework Directive, air (Nitrate Directive) and soil (Soil framework Directive in the making).

The final hypothesis discussed in this research paper is the low probability of the CAP to deliver results on the front of mitigating climate change. All the interested stakeholders have raised concerns about the reform proposal regardless their antagonism. The Commission seems to have failed to design a new farm bill that would solve the difficult equation in getting farmers to produce sufficient amount of agricultural goods in a sustainable way at an affordable price for the consumers. The gap between production driven actors and those who are more favorable to an environmentally friendly agriculture is wide and very unlikely to close in a near future. Findings have demonstrated that economic interests are well represented and defended within the European institutions: the agricultural committee in the European parliament is dominated by MEPs that have strong ties with the agro business sector, so have the members of the DG Agriculture in the Commission. Member states, under the pressure of their national farmers' unions are unwilling to accept binding requirements for environmental measures, and if so, these requirements are very low. In other words, with the lack of solid opposition to economic players involved in agriculture, the environmental cursor prior to the reform has been set very low and therefore the chance of success of the CAP to deliver environmental results seems extremely weak.

Time will tell if the 2013 CAP reform will represent a missed opportunity for the agricultural sector to address efficiently the challenge to adapt to climate change, but it is worth pointing out that concern from EU consumers for agricultural goods that respect some good farming practices has been taken into account. To be efficient in terms of environmental

benefits, the next CAP reform should be more closely integrated with the EU environmental legislations. One should not work against the other; otherwise any kind of green measures could end up being counterproductive.

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