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# CLIMATE CHANGE EFFECTS AND AGRICULTURAL SECTOR. ANY PERSPECTIVE FOR AN EUROPEAN RISK MANAGEMENT POLICY?


**Giuseppe Cucuzza**

**Department of Agricultural Economics**
**and Real Estate Appraisal, University of Catania, Italy**

**Contact: giuseppe.cucuzza@unict.it**


European Association of Agricultural Economists

Università degli Studi della Tuscia

Istituto nazionale di Economia Agraria

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## Introduction

The struggle against climate change represents one of the 'new challenges' which agriculture will have to face in the immediate future. The "Health Check" of the Common Agricultural Policy together with questions about the efficacy and simplification of the direct aid system and the adaptation of support tools for the European Union market, give climate change a central role in the relationship between agriculture and the environment, in that they are considered likely to affect the chances of success in terms of bioenergy increase and a more efficient management of hydro resources (Com 2007/722 fin).

Agriculture being subject to the effects generated by climate change should identify and develop solutions that will favour the adaptation of cultivation systems to the changes in course and should also make valid efforts in terms of mitigating and combating this worldwide phenomenon. One of the effects generated by the climate change is inherent to the management of risks in agriculture brought about by the meteorological conditions (Com 2007/722 fin). It is, therefore, necessary to define measures that can compensate for the changes and, at the same time, promote the adaptations that are necessary in the new scenario, taking into account the various local environmental conditions.

This paper try to point out some of the main aspects that could condition the development of insurance in agriculture in the light of the effects generated by climate change and to indicate the role that could be played by the public sector at European level.

With regard to this, the role of risk management systems in agriculture could be of great importance, especially in Europe as farmers have to make their decisions in a more competitive market and have also to deal with risks and global crises as a result of market liberalisation process and a diminished market and price support policy. The necessity to evaluate the ability of agriculture to mitigate the effects of climate change and to examine the possibility of integrating the climate change aspect into agricultural support programmes is also set out in the "Green Paper on Adapting to Climate Change in Europe" (Com 2007/354 fin).

## Climate Change and Agriculture

Climate change will add to other crucial point of agricultural sector during next years, mainly related with the liberalisation of trade policy and international competition. Although some positive effects are expected - in some regions (Boreal, Atlantic Central and Continental North) it will be possible to register increase in agricultural productions - negative effects will be more relevant (AEA, 2007; Com 2007/354 fin). On the basis of scientific predictions climate changes will affect crop yields, livestock management and location of production with important risks for farm income and land abandonment (Com 2007/354 fin). Particularly, different effects in the European agro-climatic zones are predicted (AEA, 2007), like increases in winter rainfall and decreases in water availability in summer; develop of new pests and diseaes; a wide reduction of crop yields and water supply. In addition, they will be

quite common or frequent heat waves, droughts and pests with negative effects in terms of crop failures, and, more generally, in the global food supply.

The International Panel on Climate Change report (IPCC, 2007) and other forecasting models show in details these and many other effects of climate change, not only with reference to agriculture but also for economics, social and environment aspects. Regions with significant risks are not concentrated in a single geographic area and adaptation will be different and needed in different agro-climatic zones at all spatial levels (AEA, 2007). But it is also important to notice the bigger role that agriculture will play in terms of adaptation, or widely of environmental and ecosystem services could play (e.g. efficient water use in dry regions; protection of water courses against excessive nutrient inflow; improvement of flood management; maintenance and restoration of multifunctional landscapes; etc.) (Com 2007/354 fin). The challenge will be to make valid adaptations in a very short time, while it will be necessary to coordinate efficient and efficacy actions at managerial, infrastructural and technical levels (AEA, 2007; Com 2007/354 fin).

**The effects on the insurance system**

It is quite sure that European farmers will have to fight against loss of agricultural production, surely in the southern regions, so the question is to verify if insurances can be used as a mechanism of adaptation and of income stability feasible in the Common Agricultural Policy.

"How to better integrate adaptation to climate change in agriculture support programmes" could be an item for every government who can promote good farming practices, compatible with the new climate conditions for a better preservation and protection of the environment (Com 207/354 fin).

With regard to these questions in the EU there are two critical points. One is the need to integrate adaptation into existing Community funding programmes and some evidence can be noticed looking at the recent evolution of the CAP and the forthcoming final results and consequently adjustments of the "Health check" (Com, 2007/722 fin). Another critical point is to develop new policy responses. Connecting with this second point, the insurance system will be very important as the increasing diffusion of damages, that will affect all the economic system with relevant financial risk for individuals, companies and financial sector, but also in terms of capacity to stimulate efficacy actions by farmers (Com 2007/354 fin).

It will be probably necessary to modify the structure of public and private capacity to cope natural risk identifying new products in the financial market but also new mechanism of cooperation and integration of public and private funds.

Finding new tools in the insurance system suitable for cope climate related risks is so becoming a real challenge not only for the agricultural sector. With regard to this challenge could be interesting promote weather derivatives and catastrophe bonds (Com 2007/354 fin).

So it will be necessary not only to develop adaptation strategies but also improving disaster or crisis management. For these reasons insurance system can play a relevant role, looking at risk management tools that have to be further strengthened, but also thinking at new tools that could be developed exploiting opportunities carried out from innovations and new technologies connected with hazards assessment and forecasting (Com 2007/354 fin). In absence of any policy reaction, many regions and countries, including European Union, will have to deal with increasingly frequent crises and disasters, with big negative social and economic impacts in the economic system (Com 2007/354 fin).

So agricultural insurance system could be intended among the actions of adaptation. Insurance sector, in fact, could develop new insurance products for reducing risks and vulnerability before disasters strike. Insurance premiums anticipating climatic changes could provide incentives for private adaptation actions (Commission EC, 2007).

Another factor that can play in favour of a wider diffusion of risk management tools in agriculture is represented by the relationship with other economic instruments. One of this is the rising relevance of the "polluter pays" principle and, with reference of water consumption, the user pays principle. They probably not address climate change directly, but if they really incentive an efficiency use of natural resources they could increase more adoption of insurance tools to reduce different types of risks in the agro-food chain (European Commission, 2007).

**The agricultural insurance system in Europe**

The agricultural insurance systems in Europe is based on many different types of mechanisms, quite different in every single member state. There are single-risk insurances (mainly hail and fire), and yield insurance, often called multi-risk insurance, because they provide coverage against all the main climatic hazards (plant diseases and plagues usually not covered) (AEA, 2007). Also the public support in the Member State is very different and in some countries, such as Spain, Austria and Italy, it is very high. The annual subsidies to agricultural insurance in EU25 are around 497 M€ (32% of premiums). The average amount of ad hoc aids in EU25 is 904 M€ (it does not include all aids given for livestock) (AEA, 2007).

Although "given the big differences in the agricultural risks, legal, social and economic backgrounds in EU countries, an EU-wide system of agricultural insurances" still continue to be "debatable" (AEA, 2007), the question is however still open. Insurance could in fact play a relevant role to adopt new efficacy strategies in the climate change effect adaptation and mitigation, more specifically looking at the impacts of extreme events. Against extreme events, these instruments can be considered and encouraged to allow farmers to increase their farming business resilience to the impacts of climate change (AEA, 2007). It seems to be necessary to encourage agricultural insurances to allow farmers to increase their resilience to climate change. This may provide further incentives for farmers to adapt their

business and buildings in order to reduce their premiums, in addition to existing CAP instruments (AEA, 2007).

## The EU different approaches on Agricultural Insurance System

### *The debate during the past*

Although in the past the European Commission had studied suitable mechanisms to encourage the use of insurance tools for improve managing risk in the agricultural sector, more recently the "Health Check" of the CAP has introduced some objections (Com 2007/722 fin). The EU Commission during last ten years has demonstrate to be quite interested in the possibility to support by public intervention agricultural insurance - a previous analysis of risk management tools in agriculture was already published by the Commission in 2001 (European Commission, 2001) - and in the 2005 it published a document where showed its proposals about the hypothesis to introduce technical measures suitable to help farmers to address risks and crises (COM 2005/74 fin).

The reason was directly linked with the CAP reform, and more specifically with the introduction of the single payment scheme. By this new approach, farmers make their production decisions on the basis of economic and agronomic criteria. Therefore, they are required to take their own responsibility for dealing with risks and crises whose effects in the past have been absorbed by market and price support policies. So they could use new and more efficient risk and crisis management instruments.

Although risks and crises may have serious economic consequences for businesses and related incomes, most of the instruments devised to provide assistance to cope with unforeseeable events rely on ad hoc measures. To reduce the adoption of ad hoc neasures, the proposals of the EU Commission could examine only few options. The insurance against natural disasters; the support of mutual funds and to provide basic coverage against income crises. The climate change effects, included in the first category, involved the provision of a financial contribution towards the premiums paid by farmers for insurance against income loss as a result of natural disaster, bad weather or disease. Mutual funds were a means of sharing risk among groups of producers, enabling farmers to be compensated in the event of loss. In the past, funds have usually been set up on the initiative of producer groups in the same sector. The third category stimulated new instruments that could be created to provide basic coverage in the event of liquidity problems or serious loss of income. The reasoning is that, while rural development programmes will be available to support major investment in restructuring and provide aid for structural adjustments, they could prove insufficient. These measures on risk and crisis management should be funded by the rural development programmes (competitiveness priority) and they could be accompained with training measures to help improve awareness of current risks and improve risk management strategies.

***The Health Check document***

More recently, in the assumption that decoupling aid allows producers to mitigate unexpected and expected risks, UE Commission affirms that price risk and production risk are the two main sources of income variation at firm level, but declares that it is not preferable to introduce a community support for risk management, authorising producer organisations to decide to include such measures in their programmes, differently in differently sectors and countries. This because the variability of market risks and weather risks in different regions and sectors. “Commission analysis and expert opinion indicate that the list of risks and their extent vary” (Com 2007/722 fin).

So at this stage for the EU Commission a unique “EU-wide solution (based on a “one-sizefits-all” approach) would not be appropriate” because “not all sectors, and more importantly not all regions and sectors even within the same Member States, face the same market risks or weather risks”. It is preferable to allow single states, regions, or producer groupings, to assess better their own risks and their preferred solution, using the rural development tools because the second pillar is more apt to provide targeted solutions (Com 2007/722 fin).

Finally the Commission thinks to extend the use of part of modulation savings to allow risk management measures in the framework of Rural Development policy, provided that they meet "green box" criteria, and carry out, at a later stage, a more general examination of risk management for the period after 2013 (Com 2007/722 fin).

***The WTO constraints***

One relevant constraint that probably still continue to limit a wide diffusion of insurance products in European agriculture is the role of the public aids with respect of international agreements and more specifically the consistency with the World Trade Organizations rules. Public intervention in the insurance sector, in fact, must not distort trade as provided for in the “Green box”. There are many reasons that make subsidies to insurance not eligible for the green box; one of the most important is that they do not follow a formal recognition by government authorities of the natural disaster. (European Commission, 2006). Actually a large part of the subsidies to crop insurances are notified within the “Amber box”, that contains other support measures to agriculture. The “Amber Box” contains other support measures to agriculture. Aids in the amber box which exceed the “de minimis” limits (5% of agricultural production for developed countries, 10% for developing countries) are subject to reduction commitments.

**Conclusions**

Agriculture is one of the economic sector in which climate change adaptation will be probably intense, but all the European economy will increasingly feel the various effects and

undoubtedly any efforts to reduce the impact of these alteration have to be encouraged by a policy coordination (Com 2007/354 fin).

Multilevel governance is therefore emerging on climate change adaptation involving all actors from the individual citizens and public authorities. Action should be taken at the most appropriate level and be complementary, based on joint partnerships. Division of competence between states and their regions varies significantly across the EU (Commission EC, 2007). A new governance of agricultural insurance at European level could be an opportunity to verify this attitude and this capacity because of the different distribution of climate change effects in the territory.

With reference to the hypothesis to introduce a European agricultural insurance policy the results of the "Health Check" indicate that any relevant decision is postponed after the 2013. debate. But probably a public intervention or a new governance of the revisited insurance system in the agricultural sector could be an example of "soft, relatively inexpensive measures", because related with the public planning, while other sort of interventions, based on structural expenditures, will be part of "costly defence and relocation measures" (Com 2007/354 fin).

Undoubtedley climate change and the effects it generates in terms of property damage, business interruption and forest fires presents a substantial financial risk for individuals, companies and the financial sector. So, financial services and insurance markets will have to find innovative ways to respond efficiently to increasing exposure to climate-related risks, maybe not only with reference to disasters. Actually there are already new financial products coming to the market, such as weather derivatives and catastrophe bonds, but they need to be further developed and adapted with the characteristics of agricultural risks.

But all the strategies that could be carried out have to be evaluated in terms of cost of adaptation to climate change effect. In this context as mitigation to climate change is explicitly mentioned throughout the Rural Development regulations, to improve a better use of this instruments in all the different member state of the EU it is necessary to include also adptation actions in the rural development strategy of Europe (AEA, 2007).

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