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## **Stakeholders Consultation**

**From Payment of Environmental Externalities to Remuneration of  
Positive Externalities in the Agriculture and Food Sector**

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# **RELEVANCE OF OECD AGRI-ENVIRONMENTAL MEASURES FOR REMUNERATION OF POSITIVE EXTERNALITIES / PAYMENTS FOR ENVIRONMENTAL SERVICES**

**Natural Resources Management and Environment Department  
Food and Agriculture Organization of the United Nations  
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## ABSTRACT

This paper reviews the development of agri-environmental policies in the European Union and other OECD countries, both in historical terms and in terms of the characteristics and challenges of different approaches. The process of reforming the EU's Common Agricultural Policy, and in particular the likely increased emphasis on payment for public goods (positive externalities and environmental services), is also reviewed. Key issues from the OECD experience are highlighted, including: the problem of indentifying the level of provision of public goods and the resulting focus on payment of prescriptions not outputs; the issue of cost-effectiveness of schemes and the balance between targeted schemes and schemes based on land-use systems; and the need for other policy measures, including research and training, to provide a base and supportive framework on which RPE/PES schemes can be built. The experience with private-sector or market-led solutions is also reviewed. Finally, some key points for the development of schemes elsewhere are identified.

## 1 Scope of this paper

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This paper provides an overview of the development of agri-environmental measures in the European Union (EU) and other Organisation for Economic Co-operation and Development (OECD) countries and potential future changes under the next stage of Common Agricultural Policy (CAP) reform. The aim is to take stock of achievements and identify implementation gaps for their eventual application in schemes such as Remuneration of Positive Externalities (RPE) and Payments for Environmental Services (PES) in the agriculture, rural areas and the food sector, as well as to identify the range of options (including strengths and weaknesses) that could be applied in developing countries with different agro-ecological and socio-political settings. From this discussion, the intention is to recommend best practices for promoting convergence of environmental, agriculture, rural areas and food security policy measures, within the broader framework of sustainable development.

## 2 An overview of European and OECD agri-environmental policies

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### 2.1 European Union

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The earliest substantive development of agri-environmental measures took place in Europe in the 1980s with a number of national initiatives in individual member-states and in European Free Trade Association (EFTA) countries, some (e.g. Austria) later to become full members of the EU. Agri-environmental measures have been a central feature of EU-wide agricultural policy since the mid-1990s, when Regulation 2082/92 was implemented for the period 1994-1999 as part of the McSharry reforms.

In broad terms, the EU Reg. 2082/92 policy framework provided for:

- Input reduction schemes, including organic farming
- Extensification of production, including conversion of arable land to permanent grassland
- Reduced stocking rates for livestock
- Preservation of rare breeds
- Establishment and maintenance of woodlands
- Long-term set-aside
- Public access to farmland
- Training and advice to improve environmental performance.

Payments were mainly based on per hectare or per animal amounts, which were calculated according to costs of compliance with scheme requirements, income forgone and (initially at least) an incentive to participate payment. Unlike the mainstream commodity support programmes, which were 100% EU financed and applicable on a common basis across the EU, the agri-environment programmes could be implemented in different forms in each member state (and in regions within states) and were co-financed by the EU and member states according to fixed rules. As a result a very wide range of schemes and payment rates can be found across the EU.

While the ideas of remuneration of positive externalities (RPE) and payments for environmental services (PES) have underpinned the EU agri-environment schemes from the outset, the implementation of these ideas has been more complicated in practice, due in part to the difficulties inherent in measuring the environmental outcomes – an issue that will be revisited later in this paper. In practice, the guideline has been that schemes should deliver significant environmental benefits over good agricultural practice. This was reinforced following the 2003 CAP reform agreement and the introduction of cross-compliance and good agricultural and environmental practice (GAEP) requirements for Single Farm Payment eligibility from 2005.

Agri-environmental measures were formally integrated with other rural development measures as part of the Agenda 2000 reforms from 2000-2006. This has continued in the 2007-2013 framework, with agri-environmental (or land management) measures forming Axis 2 of the rural development programme. In broad terms, the types of instrument envisaged have not changed significantly, although agro-forestry was introduced as an option and has been adopted in a few countries, and options to introduce schemes focusing on animal health and welfare were also introduced. Cooper et al. (2009) provide a detailed overview of the different schemes currently in place.

With the increased emphasis on the climate change and soil and water protection in addition to biodiversity conservation in the CAP Healthcheck of 2008, the emphasis within agri-environmental measures has begun to shift, and may lead to more significant changes as part of the current CAP reform debate (see below).

## 2.2 Switzerland and other EFTA countries

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Switzerland, in common with other European Free Trade Association (EFTA) countries, has traditionally provided higher levels of support to its agricultural sector than most other OECD countries. In common with other OECD countries, the focus until the 1990s was on commodity support measures. In 1998, strict cross-compliance requirements (proof of ecological performance) were introduced, including animal-friendly husbandry, balanced nutrient budgets, minimum 7% of land area set-aside as ecological compensation areas, rotations, soil protection and reduced pesticide inputs. Within this framework, already pre-1998, extensive production systems and organic farming received specific support. In 2001, the Ordinance on Regional Promotion of Quality and Networking of Ecological Compensation Areas in Agriculture introduced an additional, result-oriented remuneration scheme for agricultural and nature conservation practices. This focuses on a number of different habitat types and management options for farmers.

These approaches have been reinforced in subsequent policy reforms at 4-5 year intervals, but there is now an intensive debate about future direction when the current framework (AP2011) ends in 2011, in particular with respect to the environmental outputs achieved and the cost-effectiveness of different approaches to delivering them (Schader, 2010).

Norway also provides support for organic farming and for maintaining mountain summer grazing pastures, with soil conservation measures introduced in 1994 and a general landscape measure introduced in 2004, linked to cross-compliance. In Iceland support is restricted to soil conservation and forestry schemes (OECD, 2009).

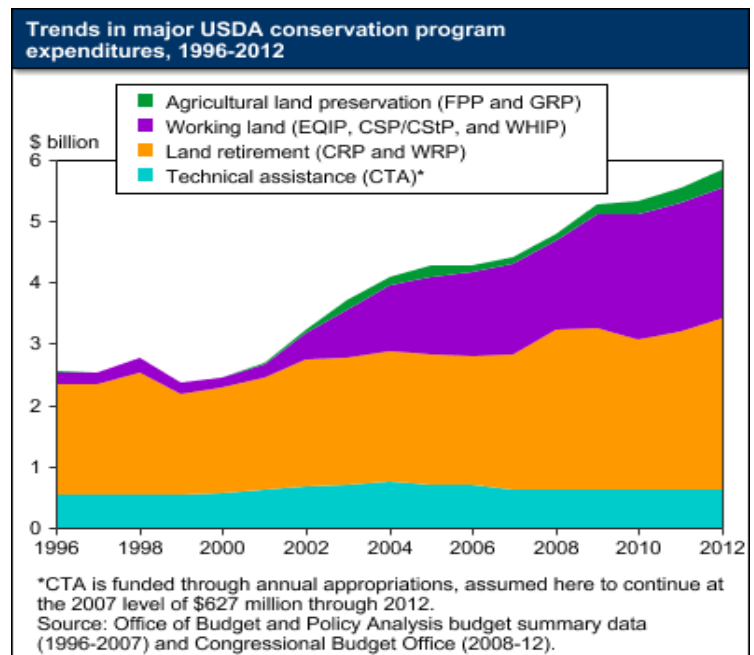
## 2.3 United States of America

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The history of the development of agri-environmental payments in USA has been somewhat different, with the majority of payments prior to 2002 being devoted to land retirement schemes, which paid farmers to take environmentally-sensitive land out of crop production for specific periods (USDA, 2009). The 2002 Farm Security and Rural Investment Act substantially increased funding for agri-environmental measures on cropped and grazing lands. Further significant reform took place as part of the Food, Conservation and Energy Act 2008, which expanded support for:

- Working-land programmes providing technical and financial assistance to farmers who install or maintain conservation practices on land in production, including assistance for conversion to organic production and specific support for limited resource, beginning and socially disadvantaged producers;

- Land retirement programmes, including conservation and wetland reserves, which generally remove land from agricultural production for a long period (at least 10 years) or, in some cases, permanently;
- Agricultural land preservation programmes enabling purchase of rights to certain land uses, such as development, in order to maintain land in agricultural use;
- Conservation Technical Assistance (CTA) providing ongoing technical assistance to agricultural producers who seek to improve the environmental performance of their farms.



Like the EU, the USA has baseline environmental compliance requirements for its mainstream commodity support programmes, emphasising the use of additional financial support, supplemented by research and education, to address environmental problems where the effects are diffuse, and therefore are difficult to attribute responsibility to an individual producer and address via regulation. However, conservation compliance programmes, aimed at reducing soil erosion and protected wetlands, have been successful and are being maintained (USDA, 2009).

## 2.4 OECD overview

OECD (2009) provides a more wide-ranging review of agri-environmental policies applied in different OECD countries. The OECD review identifies a range of mechanisms by which environmental issues in agriculture are addressed in OECD countries, including:

- Regulatory requirements
- Agri-environmental payments
- Environmental taxes
- Tradable rights and quotas
- Environmental cross-compliance
- Community based approaches
- Research and extension

While most OECD countries have a strong framework of environmental regulation in place, and some OECD countries, notable Australia and New Zealand, rely primarily on these regulatory mechanisms, such policies tend to be taken as given and are often not a central part of agri-environmental policy debate. Over the last decade, however, environmental cross-compliance as implemented in the EU, US and CH, has increasingly become a regulatory feature of eligibility for the mainstream support measures and effectively the combination of regulation and cross-compliance provides a baseline for environmental protection in agriculture.

Research and extension activities designed to investigate and improve environmental performance are also widespread and provide an essential pre-requisite for an evidence-based approach to policy-making and evaluation.

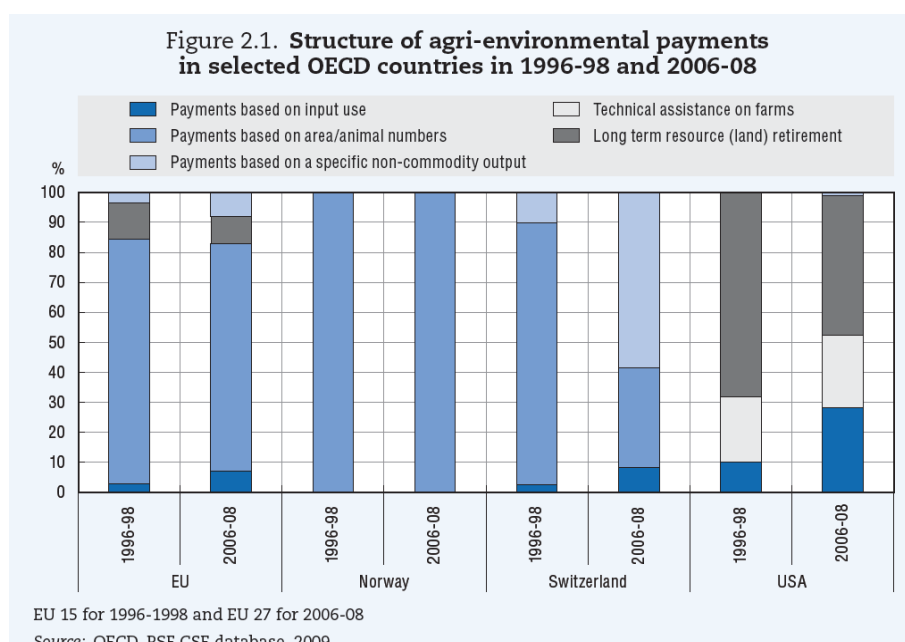
A few countries have engaged with environmental taxes (e.g. on pesticide and/or fertiliser inputs in Denmark, France, Italy, Norway, Sweden and some USA states), on tradable rights and quotas (e.g. wetlands development in the US and water extraction rights in Australia) and on community-based

approaches (e.g. Landcare in Australia). However, these cannot yet be described as mainstream approaches to environmental management in agriculture.

Agri-environmental measures therefore represent in most OECD countries the primary means by which environmental outputs beyond those that can be secured by regulatory, cross-compliance and educational approaches are delivered. OECD (2009) categorises these as:

- i) payments based on farming practices that go beyond regulatory requirements and/or compliance with good farming practice, including:
  - a. payments based on inputs;
  - b. payments based on area/animal numbers;
  - c. payments based on specific non-commodity outputs;
- ii) payments based on land retirement;
- iii) payments based on farm fixed assets (i.e. investment related); and
- iv) technical assistance on farm (training and advisory activities).

According to OECD (2009), there has been a small shift to payment for non-commodity outputs over the last decade, which has been particularly marked in Switzerland, while land retirement schemes have declined in importance in both the EU and USA.



It is notable that in Japan and Korea, both of which have relatively high levels of agricultural policy support, agri-environmental schemes have been introduced only relatively recently, while in other countries such as Mexico and Turkey, limited agricultural policy budgets have been prioritised for other purposes. However, Mexico has a programme to encourage sustainable agriculture and Turkey has been introducing a series of initiatives to support organic farming over the last 5 years. Korea has had a scheme to support reduced input use including organic farming, initially (since 1999) in water catchment areas, but since 2002 extended across the whole country, with measures for environmentally-friendly livestock production introduced in 2004. Support for reduced input use was introduced in Japan in 2007 (OECD, 2009).

### 3 Scope of EU-CAP and other OECD experiences on agri-environmental measures

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It is clear from the preceding review that, within the frameworks provided by the relevant regulations in EU and other OECD countries, a wide range of approaches have been adopted, reflecting both local environmental priorities and resource availabilities as well as differing policy perspectives on the roles that markets and policy interventions should play. It is difficult in a paper such as this to summarise the full range of approaches used, but some of the main ones are:

- Input-limiting schemes, which reduce or prohibit fertilisers and pesticides, for example:
  - Schemes with specific input limitations
  - Integrated farming and/or organic farming schemes where inputs are restricted along with other requirements
- Extensification schemes, particularly those that restrict livestock numbers on grassland
- Habitat restoration and maintenance schemes, with specific management prescriptions to recreate or maintain habitats or species (including rare breeds)
- Land use change, or land retirement schemes, including conversion or crop land to grassland or (agro)forestry and farm woodland establishment schemes – with the increased emphasis on climate change issues, some schemes to reverse previous land drainage for agriculture in order to prevent further degradation of peatlands are also being introduced.
- Capital investment to support investment in infrastructure for environmental gains, e.g. restoring stone walls and buildings representing cultural landscapes, fencing to protect hedges from browsing, or housing for livestock in winter to reduce damage to pasture.
- Catchment areas schemes, which aim to encourage all farmers in an area to participate, for example to maintain water quality

Despite the variety of approaches, in general terms, there is broad acceptance of the principle that policy intervention in all these cases may be justified because there is evidence of market failure. This is most clearly the case where positive externalities and environmental services are provided by agricultural producers. These services are typically not purchased in a market framework because the benefits accrue to society as a whole, rather than individual consumers. Even in cases where a market may exist, e.g. consumption of landscapes via tourism, the sellers of tourism services (accommodation, restaurants, travel firms) may not be those that deliver the landscape qualities attracting the tourists.

Even in the case of negative externalities, and the general agreement among OECD countries to apply the producer pays principle, the prevalence of non-point externalities (e.g. diffuse pollution of water courses and greenhouse gas emissions) in agriculture means that it is often not possible to define the polluter and may require some form of financial incentive to address specific problems. While it may be possible to consider alternative options such as taxes on inputs such as energy, water, fertilisers and pesticides, the level of taxes required to achieve change in practice may be too high and the consequent transfer of income out of agriculture potentially conflicts with other policy measures aimed at supporting agricultural incomes, including input subsidies in some cases.

There is an argument that production to defined, high environmental standards might achieve some recognition by consumers in the form of willingness to pay higher prices, for example organic farming and other sustainable agriculture certification schemes, or products of distinct geographical origin (e.g. PDO/PGO designations). However, it is questionable whether the small minority of consumers willing to pay a premium for these products are doing it in order to pay for public benefits, or even whether they should be, given that many other citizens will then be getting the benefits for free (the free-rider problem).

There is also a potential problem where the agri-environmental incentives conflict with the directly with the marketplace. This tension exists, for example, with respect to schemes designed to



encourage conversion to organic production, which may result in increases in supply of organic products above current demand, resulting in falling prices, with all producers, including those who may have converted without support, being worse off. The resolution of this is challenging – if the environmental benefits are derived from the land management as opposed to the marketing of products, does it make sense in environmental policy terms to restrict adoption of the land management practices to a level the market can stand, thus also limiting the delivery of environmental services, or would it be better to de-emphasise the link to the marketplace and to find other means to address that particular problem? In Sweden, for example, producers participating in the organic farming agri-environment scheme were not required to be certified as organic (their status being monitored by policy officers instead), but if not certified they could not under EU law market their products as organic. Farmers then had the option to become certified separately if they wished to engage with the organic market, allowing a more gradual development of supply.

If the case for agri-environmental interventions due to market failure is accepted, then there is still room for debate about the basis for calculations for payments and the most efficient approach to be used.

One such argument arises with respect to the balance between ‘broad and shallow’ schemes, which have relatively low requirements and payment rates, but may be adopted by a much larger number of farmers, compared with more focused, intensive schemes which deliver more, have higher payment rates, but lower levels of uptake. Put simply, is it better to have a scheme delivering 10 units of output per farm taken up by 50% of farmers, or a scheme delivering 50 units of output per farm taken up by only 10% of farmers, and how cost-effective are the different options? In practice, a combination of the two options may well be the most effective solution.

A related debate centres on the level of payment. Typically, for many schemes payments are based on per hectare payments, which are not differentiated significantly between farms within a region, in part because the transaction costs associated with more tailored payment rates may be too high. However, if a uniform payment rate is calculated to cover the costs and income forgone of the average farmer, there will be some who have lower than average costs, and will be over-compensated, but may be more likely to participate, and there are others who will have higher costs and be under-compensated and less likely to participate. Reducing payment rates to reduce over-compensation of some producers may result in more being under-compensated and reduced uptake. To try to avoid this, various approaches involving tendering have been proposed, which might link producers’ costs or willingness to engage more directly to the payment on offer, but in practice such alternative approaches have not been widely adopted.

#### **4 Changes foreseen in the upcoming EU-CAP reform**

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Within the European Union, there is currently intensive debate about the future of the Common Agricultural Policy with specific reference to the 2014-2020 policy programming period. CAP Reform has been an ongoing process since the early 1990s, with the introduction in 1994 of arable area payments, set-aside and livestock headage payments to replace previous price support mechanisms and address the surplus production problem. The changes were accompanied by a variety of measures, including the agri-environmental measures referred to previously, but also a range of marketing, training and other support programmes.

The Agenda 2000 reforms for the 2000-2006 period did not fundamentally alter the process initiated in 1994, but it did see the crystallisation of the two ‘Pillars’ of the CAP, Pillar 1 being the traditional CAP commodity measures and Pillar 2 being a new ‘Rural Development’ programme formed by bringing together agri-environmental, forestry, market development, capital investment aids, rural diversification, vocational training and other measures. These were measures that all had separate existences previously, and to a large extent continued to operate independently as a result of pre-existing EU and national government institutional structures.



Major changes to Pillar 1 were finally agreed with the 2003 Mid-term Review of Agenda 2000, and implemented from 2005, involving the introduction of the Single Farm Payment under Pillar 1 to replace many of the separate commodity support measures. Since then other commodity support programmes have been progressively integrated into the Single Farm Payment so that by now there are few remaining commodity-specific supports in place. At the same time, a new cross-compliance regime was introduced to ensure basic minimum environmental and animal welfare standards, and particularly to give the Commission and Member States the power to refuse to make support payments in cases where regulations, or the codes of Good Agricultural and Environmental Practice were being breached.

As a result of the major changes implemented in 2005, the 2007-2013 programme saw relatively small changes to Pillar 1 support. However, the Rural Development Programme (Pillar 2) was restructured around four axes: The first three axes were notionally linked to the familiar concepts of economic, environmental and social sustainability, with:

- Axis 1 focusing on economic issues, in particular market development, capital investments and human capital development,
- Axis 2 focusing on environmental and land management issues, including agri-environment schemes, but also forestry, agro-forestry, rare breeds and animal welfare,
- Axis 3 focusing on social or rural community issues, primarily via measures designed to support diversification of rural enterprises.

The fourth Axis was used to integrate the previous LEADER programmes, originally developed as bottom-up, community led approaches to policy making, which saw some interesting examples of integrating agri-environmental programmes with, for example, tourism. However, under the new framework, these programmes have tended to become more institutionalised and arguably less innovative, although a focus on the development of pre-commercial ideas has been retained.

A key issue for the restructured Rural Development Programme was to avoid the four axes becoming 'silos' with little or no interaction between them. The Commission placed some emphasis on exploiting cross-axis synergies – for example with respect to organic and integrated farming where agri-environmental support could be reinforced by marketing, training and rural diversification support. While it is difficult to see extensive use of cross-axis approaches in the rural development plans of many member states, many of the action plans for organic farming and similar initiatives applied at national and regional level relied on drawing down support from the different axes.

The 2008/9 CAP Health Check saw further decoupling of Pillar 1 (direct aid) payments and encouraged member states to move to flatter rates of support – i.e to reduce the extent that payments to individual farms were based on what they had historically received under the old regimes. It also introduced a new Article 68 providing for targeted measures to address economic/environmental disadvantages in certain regions/sectors. In a few countries, Article 68 has been used to 'supplement' agri-environmental support under Pillar 2, although there are rules to prevent duplication between the two funding streams. The Health Check also picked up on key 'new' challenges including climate change, bio-fuels, water management, bio-diversity and soil conservation, which were reflected in modifications to Pillar 2 (rural development support), together with an increased level of modulation to support transfer of funds from Pillar 1 to Pillar 2.

While some have argued that the current CAP Reform debate provides an opportunity to end subsidies to farmers, it is unlikely that the reforms will be this radical – the experience of the 2000 and 2007 reforms is that radical-sounding reforms are negotiated away in the compromises needed to ensure agreement between the 27 member states, and at best some modest reforms, with a probable reduction of the overall CAP budget and a further shift of resources from Pillar 1 (the mainstream commodity measures) to Pillar 2 (the agri-environmental and rural development measures), may be achieved.

The 2014-2020 CAP reform debate is taking place within the context of the recently agreed Europe 2020 strategy for 'smart, sustainable and inclusive growth' (EC, 2010). Prepared in the wake of the economic crisis, the 'Brussels' strategy agreed by the European Council in June 2010, like its predecessor Lisbon and Gothenburg strategies, struggles to balance economic growth with environmental sustainability, aiming for:

- Smart growth: developing an economy based on knowledge and innovation.
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy.
- Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion.

In some senses this continues a trend, started in Lisbon, of reducing the emphasis on environmental issues compared with Gothenburg, but clearly also reflects the financial crises and public expenditure constraints of recent years.

Initiating the debate on the latest round of CAP reform, the Commission (EC, 2009) identified food security, sustainable land management, viable rural areas, competitiveness in global markets and responding to climate change as key deliverables from agriculture, and that policy intervention was needed to address volatile markets, the delivery of public goods and a sustainable rural environment. To an extent this reflects a continued commitment to the original CAP objectives from the Treaty of Rome, which were retained unaltered in the Lisbon Treaty. However it also recognises the new challenges imposed by climate change and the need to better address the provision of public goods by agriculture. In addressing this, the Commission is particularly concerned about maintaining a level playing field and slowing the trend to re-nationalisation of agricultural policies, and argues for:

- A common regulatory framework to secure minimum standards
- A basic direct payment to secure food production and provide a safety net in the face of volatile markets and delivery of public goods, but one which is decoupled from producers' production decisions and market orientation
- Targeted measures to address specific regional circumstances, economic diversification and environmental challenges including climate change and water management.

Two key issues that the Commission is trying to address are a) following the rapid price increases in 2007 and the subsequent falls in 2008/9 and large increases (for cereals) again in 2010, what tools can be used to reduce market volatility without reverting to previous price support measures; and b) how can the direct payments (the Pillar 1 Single Farm Payment) be more directly linked to the provision of public goods.

At the time of writing, although the increased emphasis on climate change and water management issues has been stated, it is still not clear what specific reforms to agri-environment policy will be proposed. The European Commission is engaged in a public consultation process, which was launched in May 2010 and culminated in a conference in July 2010

([http://ec.europa.eu/agriculture/cap-post-2013/index\\_en.htm](http://ec.europa.eu/agriculture/cap-post-2013/index_en.htm)), with formal proposals from the Commission expected by the end of 2010. The web-based public consultation received a large number of responses, but was less conclusive about the types of policies that should be implemented, with a distinct division between those seeking a greater emphasis on food production and profitability, and those looking for environmental gains.

A key unknown at this stage is the availability of financial resources for the EU rural development programme in general and for agri-environment measures in particular. With all EU governments seeking to cut back on expenditure, it is likely that resources will be more limited than in previous policy planning periods, even if there is a shift of resources from Pillar 1 to Pillar 2. For this reason, a much bigger emphasis is being placed on discussions of cost-effectiveness than in previous

discussions, a trend which is also being seen in other OECD countries such as Switzerland. This issue is examined in more detail below.

A second point of greater emphasis in the debate is the focus on public benefit (both in Pillar 1 and Pillar 2). Clearly, not just because of the immediate financial pressures following the recession, there has been swing against particular industry sectors being supported for their own sake. Agriculture has not been immune to this, even though it may have a compelling case to make concerning its uniqueness with respect to food security and the climate/biological uncertainty with which it has to work. There is a clear expectation from at least the environmental interest groups, and increasingly from the political parties whatever their position on the political spectrum, that support for agriculture needs to be justified in terms of benefits to society.

In terms of the Commission's current consultation on the way forward, the issue of public benefits is therefore much more visible, though the argument has been around for the last twenty years if not longer. Cooper et al. (2009) were contracted by the Commission to set out the issues with respect to public good provision by agriculture. They make the familiar case that the nature of public goods is such that consumers are not willing to pay for them and producers are unwilling to produce them as there is no market for them. Given that many public goods are associated with land, that most land use is agricultural and that land use is primarily determined by private ownership rights, there is a continued justification for policy intervention to secure provision of public goods by farmers.

Of the public goods generated by agriculture, Cooper et al. (2009) emphasise environmental goods such as agricultural landscapes, farmland biodiversity, water quality, water availability, soil functionality, climate stability (greenhouse gas emissions), climate stability (carbon storage), air quality, resilience to flooding and fire, as well as a diverse suite of more social public goods, including food security and quality, rural vitality and farm animal welfare and health. While many of these may be considered tangible benefits, a number reflect less tangible concepts of security, stability/maintenance and resilience that are as relevant to food production and the environment as they are to energy security and military defence.

Cooper et al. argue that while the agri-environmental and cross-compliance measures previously implemented have succeeded in stemming decline in several areas of public good provision, there is a need for clearer target setting and improved cost-effectiveness of measures, and a need to learn from some of the more innovative, smaller-scale programmes currently being implemented. They also argue that the delivery of public goods can be achieved both by encouraging intensive producers to adopt specific environmental measures and by encouraging specific farming systems that tend to be associated with the provision of public goods, including extensive livestock and mixed systems, the more traditional permanent crop systems and organic systems.

## **5 Lessons for Remuneration of Positive Externalities (RPE) and Payments for Environmental Services (PES)**

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The FAO (2010) concept note on the remuneration of positive externalities (RPE) in the agriculture and food sector sets out a vision for how agri-environmental policies might develop in the long-term and on a more global scale. It builds on the work done in the SARD-M mountain agriculture project and the deliberations of the Adelboden group of stakeholders from different parts of the world. In 2007, the Adelboden group proposed a focus on RPE as a new area of activity. The FAO concept note is part of an effort to link this earlier work with CAP agri-environmental policies and other payment for environmental services (PES) initiatives around the world.

### **5.1 Definitions of externalities and environmental services**

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The terms RPE and PES are often used interchangeably, though the concept note talks about RPE representing the ‘expansion of the PES concept to include also social benefits (e.g. rural employment, community cohesion, avoidance of rural migration)’, but often used to indicate PES+, that is, PES with specific and additional investment in socio-economic co-benefits. There may be a need to differentiate the terms externality and environmental services more precisely in this discussion.

Externalities usually refer to effects (costs/benefits) of human activities that are not transmitted by the price mechanism/subject to economic transactions between actors. Externalities may be negative (external costs), as in the case of pollution associated with a production activity, or positive (external benefits), such as the aesthetic value to be derived from a diverse agricultural landscape. Normally, negative externalities, as they are not mediated by market prices, would be controlled by policy intervention through regulation, including application of the polluter pays principle, and potentially through restrictions (quotas) or taxes on specific practices or inputs to reduce potential damage. In some cases, a tradable permit to produce negative externalities may be introduced to enable the price mechanism to be applied to regulating production of the negative externality.

By contrast, a positive externality exists where there is a benefit to other individuals, but there is no means of capturing the value those individuals place on the benefit by means of a price paid to the generator of the externality. In such cases the free-rider problem can exist – i.e. no-one is willing to pay for the benefit as it can be obtained in any case for free. However, there may be ways in which a price can be extracted collectively by appropriately authorised organisations, for example by charging entry fees to a national park, or by a water company charging customers for clean water and paying all the farmers in the catchment area for their efforts to protect the water sources.

Unlike externalities, which are always a consequence of human activity, environmental or ecosystem services may be derived from natural systems outside the direct influence of human management. Examples include the biological processes involved in reproduction, pollination, carbon, water and nutrient cycling and soil formation by soil organisms as well as the harvestable resources that can be derived from biodiversity. Human activity may be directed to support these services, for example through the design and management of agro-ecosystems, but is not an essential pre-condition. In certain cases, the farmer may be able to capture the benefit of provision of ecosystem services within the farm, for example by creating habitats to support biological control of pests, reducing both pest damage and the need for external inputs. However, unlike the relationship between purchased inputs and yields, the exact cost and value of the ecosystem service is much more difficult to quantify. In other cases, such as production of clean water and air, the benefits accrue to society at large, and there is usually no potential for the farmer to be rewarded for his activities through the market mechanism.

In practice, policy measures may attempt to address externalities and ecosystem services interchangeably, but for obvious reasons will focus on those that can be influenced by human activity, so while the distinctions made above may be important for valuation purposes, they may be less important with respect to implementation pathways.

## 5.2 Issues relating to the implementation/evaluation of RPE/PES policies

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The FAO concept note shares much common ground with the Cooper *et al.* (2009) report for the European Commission, particularly with respect to the identification that public goods can encompass both environmental and social services. Cooper *et al.* also recognize that many outputs may have both a public and private dimension, so that policy solutions need to encourage the public while not distorting the private market aspects.

There is certainly an attractive political logic to emphasising positive externalities and environmental services as a basis for policy intervention, in that the state, or private sector intermediaries, can be seen to be rewarding individuals and companies for delivery of positive benefits to society. In principle, the agri-environmental policies being implemented in the EU,

Switzerland and other countries since the 1990s are not inconsistent with this, although their implementation is not obviously compatible with the idea, reflecting some of the compromises that have had to be made in practice and which are probably unlikely to change significantly in future because the solutions are too difficult. Cooper et al. (2009) provide a more detailed analysis of some of these problems and additional examples of output-focused schemes that have already been implemented in the EU.

For example, a common point of criticism of the EU agri-environment schemes to date has been the regulatory requirement for payment levels to be determined according to implementation costs and income forgone, rather than the value that might be attributed to outcomes delivered. In terms of accountability for public expenditure, there is a strong auditing emphasis on being able to identify what is being paid for. Many of the environmental externalities in question are diffuse in nature, or expensive to quantify, and do not lend themselves to this type of accountancy framework. The resulting compromise is that payments are related to a set of management prescriptions that are expected to generate the desired environmental outcomes, even though there is no guarantee that they will, or even a clear idea of the size of the environment benefit that might be generated.

The issue of transaction costs associated with output-based approaches is also significant. If outputs are not standard on a per farm or per unit area basis, then each farm is likely to be generating different quantities of specific outputs, theoretically requiring individual measurements to be made in each case. If this involves project officer visits and direct measurement, the transaction costs can be very high, and may exceed the payments to the producers and the value of the services being delivered.

In some cases, this can lead to the definition of proxy indicators that are less expensive to monitor. In many situations this can work successfully, but there is a risk that the use of proxy indicators can result in the focus of schemes switching from, for example, the ecosystem that needs to be supported to deliver the environmental services, to the indicator itself. This might be an individual species that can be encouraged outside the critical ecosystem framework, so that the presence of the species is no longer linked to the generation of ecosystem services that it was originally chosen to represent.

### 5.3 Targeted versus systems-based approaches

A further issue to consider is the relative merits of targeted measures to deliver specific outcomes, or more systems-based approaches delivering on a range of outcomes. According to the Tinbergen rule (Schader, 2010), there should be at least as many instruments as there are policy objectives in order to provide the most economically-efficient solution. This has been used to argue that targeted policies supported by specific instruments are more efficient than multi-objective approaches supported by a single instrument.

An alternative approach is to focus on multi-objective systems such as integrated or organic farming. These are often classified as 'input-reduction' measures, and thus may be considered diametrically opposed to RPE/PES approaches which are more output focused. However, the production standards underpinning such systems are more complex, having been developed to address a number of environmental, social and other sustainability goals simultaneously. While there is an even greater challenge measuring the outputs from such approaches, because of the range of farm types to which the production standards can be applied (from intensive horticulture to mountain pastures), there is broad agreement where such approaches are part of the agri-environmental toolbox, that they deliver on a range of objectives, though perhaps not as intensively with respect to any single objective than a targeted measure. The cost-effectiveness of the different approaches will depend on the combination of outputs, payment levels for each measure implemented, and the transaction costs involved, which may be significantly reduced in cases where, for example, third party certification systems are used.



At face value, however, the Tinbergen rule suggests that targeted policies would be more efficient than a multi-objective approach, in part because you might end up paying for results that you did not want. This has led various agricultural economists (including most recently the Swiss Federal Council 2009) to conclude that systems-focused, multi-objective policies such as organic farming area support payments are not economically sound, as the policy goals could be achieved more efficiently by more flexible and targeted combinations of various specific agri-environmental measures.

However, the Tinbergen Rule is applicable only on the assumption that there are no conflicting goals and no transaction costs. Looking at the reality of agri-environmental policy instruments, these assumptions are hardly ever given. Conflicting goals and/or detrimental side-effects exist for many agri-environmental policy instruments. Even if policies are designed especially to deal with a single environmental problem, they may have substantial effects on other environmental categories.

Schader (2010) has analysed this issue in more detail with respect to the cost effectiveness of organic farming as a tool to deliver agri-environmental goals in Switzerland. His analysis indicates that, provided systems-based approaches are part of a mix of options with targeted approaches, they can be a cost-effective means of delivering agri-environmental outcomes and that the Tinbergen rule critique only applies where systems-based approaches are used exclusively.

While Schader focused on organic farming, the issues discussed in this section would also apply to other integrated/sustainable farming systems, as well as to the more traditional farming systems identified by Cooper et al. (2009) as contributing public good provision. The focus on defined production systems may make it easier to link in market-based mechanisms to encourage them, but there is no reason conceptually why a specific standard for bundled eco-system services might not be developed as a basis for RPE/PES policies.

#### 5.4 Complementary measures required

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Despite the potential of RPE/PES approaches, these do not replace the need for other policy measures to be implemented simultaneously. There will remain a need for regulation and the application of the polluter pays principle to be applied to address most cases of negative externalities. Tradable quotas and taxes may also have a stronger role to play in this context, for example in the addressing climate change, where primary producers may have a significant role to pay with respect to GHG sequestration, and could potentially benefit financially from selling GHG emission rights. However, the biological nature of primary production, involving significant fluxes of GHGs with both fixation and release, means that it is very difficult to quantify accurately the contributions being made by primary producers, unlike in many industrial processes where input/output relationships are much clearer.

More important still is the ongoing need for research and education. Research is needed both to understand the nature of the environmental problem and how human actions can be used effectively to address it. Research is also needed to provide evidence on the extent of impacts of normal human activity, and the scale of any external benefits or environmental services that might be delivered by a relevant policy instrument.

Education, encompassing training, advice, participatory research and other extension activities, is arguably even more fundamental than research, since many actors do not set out deliberately to cause environmental damage, but are ignorant with respect to the impacts they are having and the potential for improvement. Education in a broad sense is essential to ensuring regulatory compliance as well as increasing the outputs that can be delivered for a given level of policy investment, and reducing the costs to the producer of delivering the outputs sought.

Typically within the OECD countries, research is undertaken independently of the implementation of agri-environment programmes, although there is an increasing emphasis on mid-term and ex post evaluations of schemes, many of which have been reviewed by Cooper et al. (2009). The 2007-2013

CAP reform saw the general introduction of a Farm Advisory Service (though with restricted funding) to help producers ensure compliance with environmental and other regulations. Training programmes covering technical and environmental issues have also been implemented under both the vocational training provisions of the Rural Development Plans, as well as in some cases as a specific part of agri-environmental schemes. For some schemes, for example the former Countryside Stewardship Scheme in England, project officers were available to help producers develop their environmental plans as a basis for scheme agreements. While there is an administrative purpose to this, it clearly also includes an advisory/training element. The Conservation Technical Assistance in the US also plays a similar role. However, although advice and training are generally available, the resources allocated are often limited, with participation voluntary and in some producers expected to make a contribution to costs so that uptake is low. In such cases, it could be argued that opportunities to maximise public good provision may have been missed due to inadequate skills development by operators.

## 5.5 Private sector solutions

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The EU/OECD perspective tends to assume that the state is the main actor responsible for providing remuneration for positive externalities and payment for environmental services, as these represent situations of market failure. This is not the case in all countries – examples of more market led approaches can be found in the USA and elsewhere (USDA, 2009).

However, there are some situations where private sector companies may choose to promote their own solutions. One example is that of food retailers (and some processors such as Unilever), who may be keen to assert environmental and social values as part of a strategy for differentiating themselves from competitors. In some cases, they may provide a direct financial incentive to suppliers to change practices – more frequently they may impose environmental, animal welfare and social (e.g. Fairtrade) standards on their suppliers and these are passed down the chain, not necessarily accompanied by a financial premium to compensate the costs. Where additional costs to the retailer are involved, these may be recouped through higher prices to the consumer, or possibly through higher market share.

An alternative example is that of the water companies, which have to comply with water quality regulations and face the choice of installing water purification equipment to clean-up contaminated water, or working with land managers to change practices so as to reduce initial contamination of water catchment areas. Particularly in the context of strict EU water quality regulations with respect to pesticide residues, it is often cheaper to pay land managers to reduce or avoid contamination in the first place than to pay for cleaning water supplies after the event. Particularly in Germany, but also in other countries, water companies have therefore implemented schemes to encourage low or zero use of pesticides and fertilisers (including organic manures) likely to contaminate water supplies. In some cases, these have included support for organic producers. An alternative to payments to land managers to meet specific standards, is for the land to be purchased by the water company and then rented to land managers, potentially at reduced rents, who are willing to abide by specific conditions.

The land purchase option has also been used by voluntary interest groups (e.g. environmental NGOs) to purchase land and ensure its management consistent with their specific objectives, which may be birds, wild mammals, flora etc. In the UK, the National Trust is largest land owner of this type and rents out land preferentially to farmers who undertake to meet specific environmental conditions. An alternative to outright land ownership is the use of covenants, which are used in the USA and New Zealand (Cooper et al., 2009). These are legally binding agreements linked to the title deeds of a property that bind the current and future owners in perpetuity to continue protecting a specific site.



There are also options for a mixed public-private approach – the organic farming example has already been mentioned, but for example water company catchment protection programmes can be combined with other agri-environmental schemes.

For some policy-makers working in an environment which is heavily dominated by public sector approaches to public good delivery, balancing policy-led and market-led solutions can be a significant challenge, as they do not have ownership of and therefore do not trust, the market-led solutions. This can be seen, for example, in way in which organic farming (which has the potential to use its market position to support the delivery of environmental outcomes) is dealt with in European agri-environment schemes. In some countries, such as Sweden (see above), organic farming has been encouraged as an agri-environmental policy in its own right, with a certification requirement and market link left to the individual operator to develop separately. In other countries, such as Portugal, failure to market products as organic has been seen as a disqualification criterion, even though the environmental benefits from organic farming result from the land management, not the marketing activities.

Addressing this apparent conflict between market-led and policy-led approaches is partly an institutional issue. If the regulations at international or national level are drafted in a such a way as to focus attention on specific approaches in isolation, for example the split between Axis 1 and Axis 2 in the current EU Rural Development Regulation, and national/regional government departments are structured to deliver to specific axes (for example the traditional separation of ‘food’, ‘agriculture’ and ‘environment’, then it is likely that the interaction between activities, and the synergy that could result from that, will be lost. Where it does make sense for this type of departmentalisation of activities for other reasons, then specific efforts need to be made to ensure cross-departmental communication. These initiatives can be supported by increased engagement with a broad range of stakeholders, including both industry and civil society.

## 6 Conclusions

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Over the last two decades, agri-environmental policies have become increasingly important in OECD countries, with significant public resources being spent on them. Across OECD countries, a very wide range of different schemes have been implemented and there is as yet little consensus concerning which approach works best. Increasing pressures on financial resources mean that there is now an increased emphasis on:

- More direct linking of payments to public goods (positive externalities and environmental services);
- Better specification of the environmental services to be delivered and better monitoring that delivery has taken place;
- Improved cost-effectiveness of schemes, including reducing potential for ‘over-payments’ to producers and increasing the delivery from available resources;
- Market-led solutions in some countries, but to a lesser extent the EU

In terms of the potential relevance of OECD experiences to the development of policies in other countries, FAO (2010) and Wunder (2005) provide some examples of how RPE/PES approaches have been implemented in developing countries. Wunder identifies many issues arising from current experience implementing PES schemes in developing countries – that is not the object of this paper (which is focused on learning from OECD experiences), so these developing country experiences are not reviewed here. Many of the examples provided by Wunder (2005) are either business or aid-agency led, which contrasts with the government-led approaches to agri-environmental policies adopted in most OECD countries. However, some of the more market-oriented countries, such as USA and New Zealand, share more similar experiences.

With sufficient resources, almost any policy measures or combination of public- and private-sector support could be considered. Where resources are limited, or infrastructure inadequate, alternative

options may need to be prioritised. However, building on the OECD experience, the following issues may be relevant:

- A focus on public good outputs and output targets is to be welcomed, provided that potential interactions with other policy aims and instruments are recognised and conflicts/unintended side effects are avoided.
- There needs to be an appropriate regulatory framework/cross-compliance framework to minimise the possibility of negative externalities, promote the polluter pays principle and provide a baseline on which to build RPE/PES schemes.
- The issue of land tenure and land use rights also needs to be considered: OECD models include direct land ownership and control (not necessarily by the public sector), land ownership managed by tenants under conditional agreements, and covenants linked to the property title deeds. There may be scope for land reform policies to treat externalities and provision of environmental services separately from other land use rights, but this needs to be addressed specifically in such debates.
- Particular care relating to the definition of ecosystem services and selection of monitoring indicators is required, particularly where specific land use systems believed to contribute environmental services, or bundled environmental services are involved. The causal relationships between land use practices and specific environmental services need to be well researched and understood.
- While supporting specific land use systems in pursuit of multiple objectives may be considered economically inefficient due to the potential for over-delivery of some outputs, the combination of systems-based approaches with more targeted measures can be cost-effective.
- Where payments are directly linked to delivery of specific services, then delivery needs to be ensured prior to payment, but other mechanisms are needed to ensure delivery if a specific land use system is being supported.
- Alternative mechanisms, such as auctions, for establishing payment rates may need to be explored to avoid over- or under-compensation in order to achieve specific targets, although account also needs to be taken of the weaknesses of these approaches (Cooper *et al.*, 2009).
- Schemes need to be supported by appropriate training, advice and other extension activities. Improving producer skills, understanding and engagement is a key mechanism to ensure effective use of resources and potentially to increase the quantity of public goods that can be purchased for a fixed amount. While OECD schemes typically provide for such activities, the level of resources allocated is generally low, and consideration should be given to significantly increasing the share of resources allocated to extension work.
- The success of Landcare schemes in Australia, and some catchment schemes in Europe, also indicates that group approaches, involving peer-group pressure and mutual learning may be worth considering and highly relevant in circumstances where the legal/administrative relationship between individual producers and the relevant agencies is less formal.
- Transaction costs, both for the implementing agency and for the producer, can be very high in schemes which are highly customised to the individual holding – a compromise between the principle of payment for public good, the accuracy of specifying and monitoring service delivery, and transaction cost may be necessary.
- Certification systems for land use systems that are considered to deliver environmental services (e.g. organic, Rainforest Alliance) may be used to verify compliance with a PES scheme, reducing transaction costs if linked to appropriate marketing opportunities. In order to reduce transaction costs and burdens on producers, multiple visits duplicating control functions should be avoided.

## 7 References

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