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RELEVANCE OF OECD AGRI-ENVIRONMENTAL MEASURES FOR PES

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CONTENTS

Abstract	46
An overview of European and OECD agri-environmental policies.	46
OECD countries	49
Scope of the EU Common Agricultural Policy (CAP) and other OECD experiences on agri-environmental measures	51
Changes foreseen in the upcoming EU-CAP reform.	54
Lessons for PES	58
Conclusions.	65

ABSTRACT

This chapter reviews the development of agri-environmental policies in the European Union (EU) and other Organisation for Economic Co-operation and Development (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 (CAP) and, in particular, the likely increased emphasis on payments for public goods (positive externalities and ecosystem 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 payments for 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 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.

AN OVERVIEW OF EUROPEAN AND OECD AGRI-ENVIRONMENTAL POLICIES European Union

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 European Union (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 Regulation 2082/92 policy framework provided for:

- * **Input reduction schemes, including organic farming;**
- * **Extensification of production**, including conversion of arable land to permanent grassland;
- * **Decrease in stocking rates for livestock;**
- * **Preservation of rare breeds;**
- * **Establishment and maintenance of woodlands;**
- * **Long-term setting aside of land;**
- * **Public access to farmland;**
- * **Training and advice to improve ecological 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 in the programme. Unlike the mainstream commodity support programmes, which were fully EU-financed and applicable on a common basis across the EU, the agri-environmental 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 Payments for Ecosystem Services (PES) have underpinned the EU agri-environmental 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 below. In practice, the guiding premise has been that schemes should deliver significant environmental benefits over good agricultural practices. This was reinforced following the 2003 CAP reform agreement, together with 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 the second pillar of the Rural Development Programme. In broad terms, the types of instruments envisaged have not changed significantly, although agroforestry was introduced as an option and has been adopted in a few countries; 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.

Since the mid-1990s, agri-environmental measures have been a key issue in the agricultural policy of the European Union

With the increased emphasis on 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.

Switzerland and other EFTA countries

Switzerland, as with other European Free Trade Association (EFTA) countries, has traditionally provided higher levels of support to its agricultural sector than most other OECD countries. As with other OECD countries, the focus until the 1990s was on commodity support measures. In 1998, strict environmental cross-compliance requirements (proof of ecological performance) were introduced, including animal-friendly husbandry, balanced nutrient budgets, a minimum of seven percent of land area set aside as ecological compensation areas, rotations, soil protection and a reduction of 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 intense debate about the future when the current framework 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 environmental cross-compliance. In Iceland, support is restricted to soil conservation and forestry schemes (OECD, 2009).

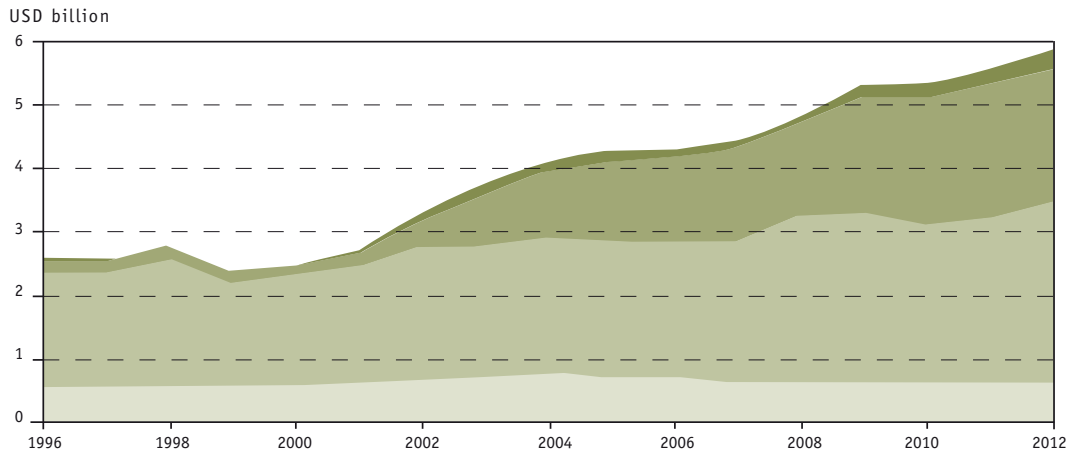
United States of America

The history of the development of agri-environmental payments in the United States of America (USA) has been somewhat different (Figure 4), with the majority of payments prior to 2002 being devoted to land retirement schemes that 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 of 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 ten years) or, in some cases, permanently;
- ❖ **Agricultural land preservation programmes** enabling purchasing of the 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 ecological performance of their farms.

Like the EU, the USA has baseline environmental compliance requirements for its mainstream commodity support programmes, emphasizing the use of additional financial support, supplemented

Figure 4
Trends in major USDA conservation programme expenditures 1996-2012



LEGEND

- Agricultural land preservation (FPP and GRP)
- Working land (EQUIP, CSI/CStP, and WHIP)
- Land retirement (CRP and WRP)
- Technical assistance (CTA)*

*CTA is funded through annual appropriations, assumed here to continue at 2007 level of USD 627 million through 2012.

Adapted from USDA, 2009

by research and education, to address environmental problems where the effects are diffuse. In such circumstances, it is difficult to attribute responsibility to an individual producer and to address the problem via regulation. However, conservation compliance programmes, aimed at reducing soil erosion and the protection of wetlands, have been successful and are being maintained (USDA, 2009).

OECD COUNTRIES

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 payment schemes;
- * 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, notably Australia and New Zealand, rely primarily on these regulatory mechanisms, such policies tend to be taken as a given and rarely play a central role in agri-environmental policy debate. Over the last decade, however, environmental cross-compliance, as implemented in the EU, USA and Switzerland, has increasingly become a regulatory feature of eligibility for mainstream support measures, with the combination of regulation and cross-compliance providing 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 states in the USA), on tradable rights and quotas (e.g. wetlands development in the USA and water extraction rights in Australia) and on community-based approaches (e.g. Landcare¹ in Australia). However, these cannot yet be described as mainstream approaches to environmental management in agriculture. Agri-environmental measures in most OECD countries, therefore, represent the primary means by which environmental outputs beyond those which

can be secured by regulatory, cross-compliance and educational approaches are delivered. The OECD (2009) categorises these as:

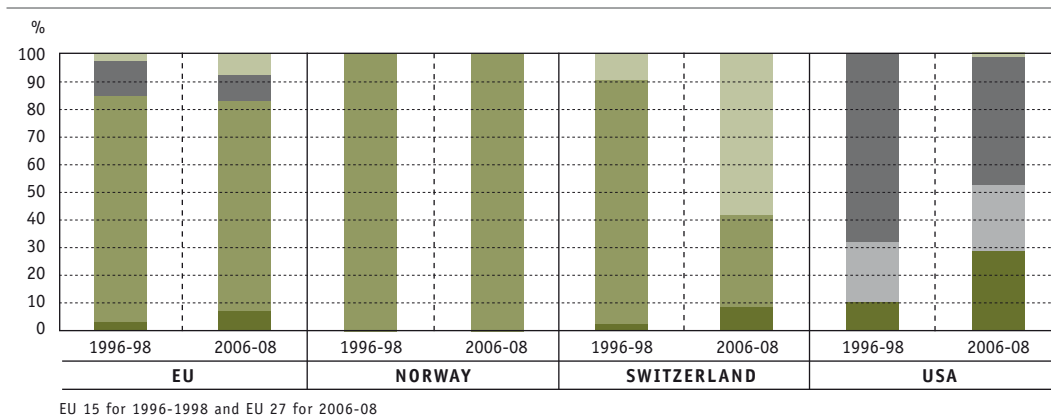
- * **Payments based on farming practices** that go beyond regulatory requirements and/or compliance with good farming practice, including: payments based on inputs, payments based on area/animal numbers, and payments based on specific non-commodity outputs;
- * **Payments based on land retirement;**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

According to the 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 the USA (Figure 5).

*Most OECD
agri-environmental
schemes include
incentives for agriculture
that preserves
ecosystem services and
natural capital*

1 <http://www.landcareonline.com.au>

Figure 5
Structure of agri-environmental payments in selected OECD countries in 1996-1998 and 2006-2008



LEGEND

- Payments based on input use
- Payments based on area/animal numbers
- Payments based on a specific non-commodity output
- Technical assistance on farms
- Long term resource (land) retirement

Adapted from OECD, 2009

It is notable that in Japan and Korea, both of which have relatively high levels of agricultural policy support, agri-environmental schemes were 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 also has a programme to encourage sustainable agriculture, while Turkey has been introducing a series of initiatives to support organic farming over the last five 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 only introduced in Japan in 2007 (OECD, 2009).

SCOPE OF THE EU COMMON AGRICULTURAL POLICY (CAP) AND OTHER OECD EXPERIENCES ON AGRI-ENVIRONMENTAL MEASURES

It is clear from the preceding review that, within the frameworks provided by the relevant regulations in the 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.

While it is difficult to summarise the full range of approaches used concisely, some key schemes include:

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

Despite the variety of schemes, in general terms, there is a 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 ecosystem services are provided by farmers. These services are typically not purchased in a market framework because the benefits accrue to society as a whole, rather than to individual consumers. Even in cases where a market may exist, e.g. consumption of landscapes via agrotourism, the sellers of tourism services (e.g. accommodation, restaurants, travel companies) may not be those that are responsible for the delivery of 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 watercourses and greenhouse gas emissions) in agriculture means that it is often not possible to define the polluter and may require some form of financial reward to address specific problems. While it may be possible to consider alternative options, such as taxes on inputs (energy, water, fertilisers, pesticides), the level of taxes required to achieve change in practice may be too high. Moreover, 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 according to defined and high environmental standards might achieve some recognition by consumers in the form of willingness-to-pay (WTP) price premiums, 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, 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 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 the 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 land management, as opposed to the marketing of products, does it make sense in environmental policy terms to restrict the adoption of land management practices to a level that the market can withstand, thus also limiting the delivery of ecosystem services, or would it be better to de-emphasize the link to the marketplace and to find other means to address that particular problem? In Sweden, for example, producers participating in organic farming agri-environmental schemes were not required to be certified as organic (their status being monitored by policy officers instead). However, if not certified they could not (under EU law) market their products as organic. Farmers then have the option to become certified separately if they wish to engage with the formal organic market, allowing a more gradual development of supply.

The 2003 EU-CAP reform saw the introduction of Single Farm Payments and environmental cross-compliance regulation

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 (see also Chapter 3 “Opportunities and gaps in PES implementation and key areas for further investigation”).

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

A related debate centres on the criteria used to determine the level of payment. Typically, many payment schemes 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, while 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 (see also Chapter 3 “Opportunities and gaps in PES implementation and key areas for further investigation”). To try to avoid this, various approaches involving tendering have been proposed, which might link producers’ costs or willingness to engage more directly with the payment on offer; however, in practice such alternative approaches have not been widely adopted (see Chapter 4 “Cost-effective targeting of PES”).

CHANGES FORESEEN IN THE UPCOMING EU-CAP REFORM

Within the EU, there is currently intense debate about the future of the Common Agricultural Policy (CAP) 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 in this chapter, 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, the first pillar being the traditional CAP commodity measures and the second pillar 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 continue to operate independently as a result of pre-existing EU and national government institutional structures.

Major changes to the first pillar were finally agreed with the 2003 mid-term review of Agenda 2000 and implemented from 2005, involving the introduction of the Single Farm Payment 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 there are now few remaining commodity-specific supports in place. At the same time, a new environmental cross-compliance regime was introduced to ensure basic minimum agri-environmental and

animal welfare standards. This regime also gave the EU and member states the power to refuse to make support payments in cases where regulations or the codes of Good Agricultural and Environmental Practice (GEAP) were being breached.

As a result of the major changes implemented in 2005, the 2007-2013 programme saw relatively small changes to support to the first pillar. However, the Rural Development Programme (the second pillar) was restructured around four axes. The first three axes (economic, environmental and social) were notionally linked to the familiar concept of 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, as well as forestry, agroforestry, rare breeds and animal welfare; and
- ❖ **Axis 3 focusing on social or rural community issues**, primarily via measures designed to support the diversification of rural enterprises.

Axis 4 was used to support bottom-up, community-led approaches to policy-making and integrate the previous LEADER programmes. However, under the 2007-2013 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 European Commission placed some emphasis on exploiting cross-axes 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 levels relied on drawing support from the different axes.

The 2008/2009 CAP Health Check saw further decoupling of the first pillar's (mainstream commodity measures) payments and encouraged member states to move to flatter rates of support — i.e. to reduce the extent to which 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 the economic and environmental disadvantages in certain regions/sectors. In a few countries, Article 68 has been used to 'supplement' agri-environmental support under the second pillar, 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, biofuels, water management, biodiversity and soil conservation, which were reflected in modifications to the second pillar (agri-environmental and rural development measures), together with an increased level of modulation to support the transfer of funds from the first to the second pillar.

The 2014–2020 CAP reform is focused on the agreed Europe 2020 strategy for ‘smart, sustainable and inclusive growth’

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 the first to the second pillar, 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, 2010a). Prepared in the wake of the global 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 that 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 European Commission 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 (EC, 2009). To a certain 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 European Commission is particularly concerned about maintaining a level playing field and slowing the trend to re-nationalisation of agricultural policies, arguing 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 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 European Commission is trying to address are: (a) what tools can be used to reduce market volatility following the rapid price increases in 2007, the subsequent

falls in 2008/2009 and large increases (for cereals) again in 2010, without reverting to previous price support measures; and (b) how the direct payments (the first pillar Single Farm Payment scheme) can be more directly linked to the provision of public goods, with discussions focusing on mandatory environmental set-aside and other land management measures.

Although the increased emphasis on climate change and water management issues was stated in 2010, it is still not clear what specific reforms to agri-environmental 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 2010², with formal proposals from the Commission presented at the end of 2010 (EC, 2010b).

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 versus 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-environmental 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 the first to the second pillar. 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. A second point of greater emphasis in the debate is the focus on public benefits in both pillars. Clearly and not just because of the immediate financial pressures following the recent recession, there has been a swing against particular industrial sectors being supported for their own sakes. 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 environmental interest groups and increasingly from 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 European Commission's current consultation on the way forward, the issue of public benefits is, therefore, much more visible, even though the argument has been around for the last 20 years, if not longer. Cooper *et al.* (2009) were contracted by the European 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

2 http://ec.europa.eu/agriculture/cap-post-2013/index_en.htm

land use is primarily determined by private ownership rights, there is a continued justification for policy intervention to secure the provision of public goods by farmers.

Of the public goods generated by agriculture, Cooper *et al.* (2009) emphasize 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.* (2009) argue that while the agri-environmental and environmental 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, as well as 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 agricultural systems, more traditional permanent crop systems and organic systems.

LESSONS FOR PES

Definitions of externalities and ecosystem services

Externalities usually refer to the effects (costs/benefits) of human activities that are not transmitted by the price mechanism/subject to the 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 (see also Chapter 1 “The role of PES in agriculture”). Normally, negative externalities, as they are not mediated by market prices, would be controlled by policy intervention through regulations, including application of the ‘polluter pays’ principle and potentially through restrictions (quotas) or taxes on specific practices or inputs to reduce potential damage to public goods. 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 (see also Chapter 8 “PES within the context of Green Economy”).

Negative externalities are often controlled by policy interventions aimed at restricting specific potentially damaging practices

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. the unwillingness of some to pay for a benefit that can anyway be obtained for free). However, there may be ways in which a price can be extracted collectively by appropriately authorised organizations, 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, 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 different 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 the provision of ecosystem services within the farm, for example, by creating habitats to support the biological control of pests, reducing both pest damage and the need for external inputs (see also Chapter 1 “The role of PES in agriculture”). 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 farmers to be rewarded for their activities through market mechanisms.

Positive externalities are benefits to others but there is no way valuing them through payments to the externality generator

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.

Issues relating to the implementation/evaluation of PES policies

Cooper *et al.* (2009) recognise that many outputs may have both public and private dimensions, so that policy solutions need to encourage the public, while not distorting the private market aspects. There is certainly an attractive political logic in emphasizing positive externalities and ecosystem services as a basis for policy intervention in that the state or private sector reward individuals and companies for the delivery of positive benefits to society. In principle, the agri-

environmental measures being implemented in the EU, Switzerland and other countries since the 1990s are not inconsistent with this, although their implementation is not directly 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 the future because the solutions are too difficult. Cooper *et al.* (2009) provide a more detailed analysis of some of these problems and

Payments are determined according to implementation and alternative opportunity costs, rather than the delivered benefits

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 inspection 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 (see also Chapter 4 “Cost-effective targeting of PES”). 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 ecosystem services to the indicator itself.

Targeted versus multi-objective 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 rule has been used to argue that targeted policies supported by specific instruments are more efficient than multi-objective approaches supported by a single instrument.

Multi-objective systems are often used in integrated or organic farming. However, the production standards underpinning such systems are more complex, having been developed to address a number of different environmental and social goals simultaneously. While there is an even greater challenge measuring the outputs from such systems 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 and that they deliver on a range of objectives, though perhaps not as intensively with respect to any single objective, rather than a targeted measurement would. 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 by preventing having to pay for unwanted results. This has led various agricultural economists (including, most recently, the Swiss Federal Council in 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.

There is an ongoing need for research and education to understand how human actions can be effective in preserving ecosystems

However, the Tinbergen rule is applicable only where it is assumed that there are no conflicting goals and no transaction costs. Looking at the reality of agri-environmental policy instruments, these assumptions are hardly realized. 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) analysed this issue in more detail with respect to the cost effectiveness of organic farming as a tool to deliver agri-environmental benefits 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 to 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 ecosystem services might not be developed as a basis for PES policies.

Complementary measures required

The potential of PES schemes is based on the need for other policy measures to be implemented simultaneously (see also Chapter 8 “PES within the context of Green Economy”). There is a need for regulation and for 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 play with respect to greenhouse gas (GHG) sequestration and could potentially benefit financially from selling GHG emission credits (see Case Study 10 “Plan Vivo: A voluntary carbon sequestration PES scheme in Bushenyi district, Uganda”). However, the biological nature of primary production, involving significant fluxes of GHGs both with fixation and release, means that it is very difficult to accurately quantify the contributions being made by primary producers, unlike in many other 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 ecosystem 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 unaware of the impacts they are having and the potential for improvement. Education, in a broad sense, is essential to ensuring regulatory environmental cross-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 for 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 environmental cross-compliance. Training programmes covering technical and environmental issues have also been implemented under both the vocational training provisions of the rural development plans (second pillar), 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 reasoning to this, it clearly also includes an advisory/training element. Conservation Technical Assistance in the USA 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 cases, producers are expected to make a contribution to the costs, so uptake is low. In such cases, it could be argued that opportunities to maximise public goods provision may have been missed due to inadequate skills development by operators.

Private sector initiatives

The EU/OECD perspective tends to assume that the state is the main actor responsible for providing PES schemes, thereby representing situations of market failure. This is not the case in all countries though — examples of more market-led approaches can readily be found in the USA and elsewhere (USDA, 2009). There are some situations where private sector companies may lead PES initiatives themselves (see also Chapter 7 “Enabling conditions and complementary legislative tools for PES”). One example is that of food retailers and some processors 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. fair trade) 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.

The private-sector can establish a PES scheme or agree to engage with the public sector in mixed public-private partnerships

An alternative example is that of the water companies that have to comply with water quality regulations and face the choice of either 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. 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, rather than having to pay for cleaning water supplies after the event. Especially 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 leased to land managers, potentially at reduced rents, for those 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 is consistent with their specific objectives,

including birds, wild mammals, flora, etc. In the UK, the National Trust is the largest landowner of this type and rents out land preferentially to farmers who undertake to meet specific environmental requirements. 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, such as organic farming, but also water company catchment protection programmes combined with other agri-environmental schemes.

For some policy-makers, working in a situation which is heavily dominated by public sector approaches to deliver public goods, balancing policy-led and market-led solutions can be a significant challenge because they do not have ownership over and, therefore, do not trust the market-led solutions. This can be seen, for example, in the 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-environmental schemes. In some countries, such as Sweden, organic farming has been encouraged as an agri-environmental policy in its own right, with certification requirements and market links 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 land management, not marketing activities.

Addressing this apparent conflict between market- and policy-led approaches is partly an institutional issue. If the regulations at the international or national levels are drafted in such a way as to focus attention on specific approaches in isolation, for example, the split between the first and second pillars of the current EU rural development regulations and the way in which national/regional government departments are structured to deliver on specific themes (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 compartmentalisation 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.

CONCLUSIONS

Over the last two decades, agri-environmental measures 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 pressure on financial resources means that there is now an increased emphasis on:

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

In terms of the potential relevance of OECD experiences to the development of policies in other countries, the FAO (2010) and Wunder (2005) provide some examples of how PES approaches have been implemented in developing countries. Wunder identifies many issues arising from current experience implementing PES schemes in developing countries with many of the examples either being business or aid-agency led, in contrast with the government-led approaches to agri-environmental measures adopted in most OECD countries. However, some of the more market-oriented countries, such as the 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.
- ❖ **An appropriate regulatory and/or environmental cross-compliance framework** is needed to minimise the possibility of negative externalities, promote the 'polluter pays' principle and provide a baseline on which to build PES schemes.
- ❖ **Land tenure and land-use rights** also need 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 the provision of ecosystem services separately from other land-use rights, but this needs to be addressed specifically in such debates.

- ❖ **Selection of monitoring indicators** is required, particularly where specific land-use systems are believed to contribute single or bundled ecosystem services. The direct linkage between specific land-use practices and specific ecosystem services need to be well identified and understood in different agro-ecological conditions.
- ❖ 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 more cost-effective.
- ❖ Payments need to be made upon **conditionality** of the delivery of specific ecosystem services and 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 and other participatory mechanisms**, 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.
- ❖ Schemes need to be supported by **appropriate training**, advice and other extension activities. Improving producer skills, understanding and engagement is a key mechanism to ensuring 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 the producer, can be very high in schemes that are highly customised to the individual holding — a compromise between the principle of payments for public goods, the accuracy of specifying and monitoring service delivery and the transaction cost may be necessary.
- ❖ **Certification schemes** for land-use systems that are considered to deliver ecosystem 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 that duplicate control functions should be avoided (see also Chapter 5 “Social and cultural drivers behind the success of PES”).

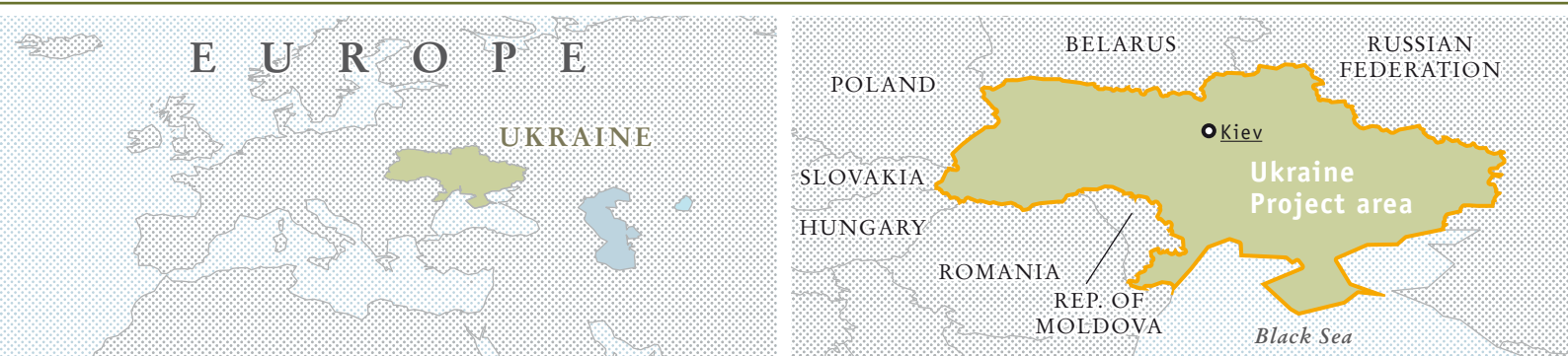
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GEOGRAPHICAL INDICATION (GI) CERTIFICATION IN UKRAINE

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A study was conducted in 2009-2010 by Heifer International (Heifer-Ukraine) under the financial and conceptual support of the FAO to highlight the potential to promote geographical indication (GI) certification of some traditional food products in Ukraine. The process revealed some major constraints in the existing legal framework on GI certification and a lack of harmonisation with EU legislation.

Ukraine Law No. 752 on Geographical Indications, adopted in 1999, provides a legal basis for the protection of the rights to indicate the origin of goods, but this legislation lacks a clear distinction between the definitions of the Protected Denomination of Origin (PDO) and the Protected Designation of Geographic Origin (PGI). The application for GI certification has to be reviewed and cleared by a competent state body before being submitted and a fee of about €100 has to be paid. However, the legislation does not cover some fundamental aspects of GI certification, such as the identification of criteria to provide description, specification and reputation of the GI products, as well as the standards or protocols for their production. Prior review of the application and certification is done by different state bodies with no clear coordination between them. Furthermore, once the certificate is issued, there is no system of control in place that can monitor the compliance of the GI certification with its specification requirements.

Above all, the present legislation restrains any possibility of collective action and community-based initiatives aimed at rural development and the promotion of traditional and local food products. In other words, while it allows a single producer to individually obtain GI certification for a certain product, it prevents groups of producers to apply for such certification collectively. This at least partly explains why the sole Ukrainian product to have received GI certification is bottled mineral water where only a single producer/company is involved. Another reason of the low activity of producers in registering their products is poor awareness about GI certification in general.



Nevertheless, being an important producer of cereals, fruits, oil seeds and dairy products, Ukraine has great potential to introduce several traditional GI-certified food products to the market and the circuit of rural gastronomic tourism.

Heifer-Ukraine interviewed 1 000 consumers, sampled from ten different administrative Ukrainian regions, as well as 300 small and medium-sized producers to identify a shortlist of potential products suitable for GI labelling and people's attitudes towards GI certification. Potential GI candidate products include sweet onions from the Yalta region (*tsybulya "Yaltyns'ka"*), watermelons (*kavun*) from the Kherson region, soft cheese (*bryndza*) from the Zakarpattia region and fruit jam from apples (*doneshta variety*) from the Kamyanka and Vinnitsa regions (Figure 6). The investigation further revealed that people generally have little knowledge about the traditional and local products of the various Ukrainian regions and about the GI certification process. They believed that public policies should promote local products and give financial support for their production. Thus, this example clearly shows how poor legislation and policies at the national level determine the lack of knowledge and interest amongst both consumers and producers. As a consequence, farmers cannot make use of the potential of GI certification for additional income generation.

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Current pages (from left to right):

- Ukraine has a strong tradition of agriculture and agricultural land per capita is higher than the EU average.
- Children drinking milk in the rural settlement of Samiilychi in Volyn oblast, Ukraine.
- In Ukraine, a law was adopted in 1999 for the protection of the right to indicate the origin of goods; however, no traditional food products have been registered yet.

Figure 6
Selected study areas linked to possible geographic certification of local products



LEGEND

- Project site areas with potential certification of local products

Adapted from original map by Oksana Osadcha (Heifer Project International)