



# **OECD WORKSHOP EVALUATION OF AGRI-ENVIRONMENTAL POLICIES**

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## **ABSTRACTS**

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### ABSTRACTS

#### SESSION 2: EVALUATION OF AGRI-ENVIRONMENTAL PROGRAMMES: SOME ISSUES

##### ***Evidence Based Agri-environmental Policies - Can Institutionalised Evaluation Procedures Provide Useful Input? The Swedish Experience***

**Sören HÖJGARD and Ewa RABINOWICZ**, Swedish University of Agricultural Science Sciences, Uppsala, Sweden.

Environmental measures constitute a large part of Rural Development Programme (RDP) of the EU accounting for about 44% of the RDP spending. This is not a negligible amount taking into account additional money from domestic sources. Hence, it seems highly relevant to ask what benefits those policies actually deliver. The measures are subject to an institutionalized evaluation procedure based on a set of common evaluation questions and indicators. This is an important step towards increasing the credibility of the measures to the citizens. However, there are problems that need to be solved if the evaluation process shall realize its full potential.

The paper is based on experiences from the recent mid-term evaluation of the Swedish RDP, which is dominated (70%) by Axis 2 i.e. environmental measures. The paper presents the results of the evaluation of Axis 2 focusing on methodological aspects. Evaluation of impacts on the environment is especially cumbersome due to difficulties to identify control groups and presence of many interacting factors. Based on their experiences, the authors identify major weaknesses of the present evaluation procedure and suggest appropriate remedies. The weaknesses include, inter alia, vague concepts, insufficient availability of suitable methodology and lack of empirical data. The suggested improvements are: (1) the common evaluation questions that govern the process should be precise – i.e. not require, or be open to interpretation by the evaluator, (2) the evaluation procedure should focus more strongly on efficiency and not be content with establishing whether or not the measures have succeeded to increase the participation; when possible the benefits should be assessed in monetary terms, (3) modelling approaches are often relied upon to resolve the problem of missing control groups. Suitable off-the-shelf-models are, however, not universally available. Hence, this type of methodology needs to be developed in advance and in a coordinated way to ensure appropriate coverage (MS, regions, evaluation questions), (4) given the notorious lack of suitable empirical data, there should be efforts to develop a coordinated data generation process in the Member States. Existing register should, moreover, be better utilized and adjusted to serve evaluation purposes. The FADN could be redesigned with respect to selection of farms and type of data collected to better guide evaluation of environmental and other rural development policies.

## SESSION 3a: EVALUATION OF AGRI-ENVIRONMENTAL PAYMENTS

### *Cost-effective Incentives for Farmers to Deliver Public Goods*

**Hans BRAND**, Policy Co-ordinator, Department for the Common Agricultural Policy, Ministry of Economic Affairs, Agriculture and Innovation, The Hague.

Markets are generally seen as the best mechanism to deliver the *commodities* demanded by consumers, although a public safety net may be needed. The introduction of decoupled direct payments in the EU came across with the introduction of cross compliance. Cross compliance can be seen as an instrument to address the *public bads* associated with commodity production, constituting a legal level playing field.

However it is also recognised that the market fails in the delivery of *public goods* or at least is imperfect. Public intervention is needed to provide or facilitate incentives for the delivery of those public goods demanded by society that are not jointly supplied as a consequence of commodity production or cross compliance. Thus, public goods are economically important as they can lead to additional income sources for farmers or to jobs beyond agriculture.

The policy framework for the delivery of public goods should be aimed at supporting and complementing markets beyond regulation. This assumes the existence of a targeted policy addressing the delivery of public goods and the right incentives for beneficiaries. Suppliers and consumers should be provided with the right incentives to make decisions taking account of the true costs and benefits associated with their use of scarce resources. As decoupled payments in the CAP don't have any link anymore with type, extent and/or economic value of agricultural production by the farmer, it will become very difficult to calculate adequate levels of payments for delivering public goods. The key question is therefore what are cost-effective incentives that stimulate farmers to deliver public goods and ultimately to an effective policy?

### *Evaluation of Agri-environmental Measures in Switzerland – Results and Impacts of Agricultural Policy Reform*

**Ruth BADERTSCHER**, Federal Office for Agriculture, Planning and Evaluation Directorate, Ecology Unit, Bern, Switzerland

Since 1992 Switzerland has adopted step by step a system of agri-environmental measures. Agri-environmental goals have been introduced and the construction of a monitoring system is nearly finished. Different evaluations have shown strengths and weaknesses of these measures and the system of measures. The paper shows important results and recommendations as well as the current proposition for their implementation in the agricultural policy of the years 2014-17. This next step of agricultural policy reform will be evaluated with data and methods at the state of the art.

### *Environmental Effects of Organic Farming – State of the Art and Policy Implications*

**Jörn SANDERS**, Johann Heinrich von Thünen Institute (vTI), Germany

Various meta-studies give evidences that organic farming provides various environmental benefits such as enhancement of soil structures, water conservation, mitigation of climate change or enhancement of biodiversity. These evidences are often used as a justification for supporting organic farming. After

providing a summary of the state of the art with respect to the environmental benefits of organic farming arguments given to support financially organic farms are critically reflected.

### **Landscape Cohesion and the Conservation Potential of Landscapes for Biodiversity: Evaluating Agri-environment Schemes Using a Spatially Explicit Agent-based Modelling Approach**

**Marleen SCHOUTEN<sup>1</sup>, Nico POLMAN<sup>2</sup>, Eugène WESTERHOF<sup>2</sup> and Paul OPDAM<sup>3</sup>,**

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2. Agricultural Economics Research Institute (LEI), The Hague, The Netherlands.

3. Land Use Planning Group, Wageningen University, The Netherlands.

This paper proposes a spatial explicit agent-based model to evaluate the impact of agri-environment schemes on the spatial cohesion of agricultural landscapes in the light of habitat network patterns. Networks of nature reserves are being proposed as a solution when the degree of fragmentation is considered to endanger the long-term persistence of species diversity. Agri-environment schemes are supposed to give a positive contribution to these networks. The model presented in this paper combines the spatial dynamics in land ownership, land use and the importance of agri-environment schemes in conserving biodiversity through capturing the heterogeneity of individual farmers as well as their dynamics in a spatial-explicit landscape. The paper evaluates the effects of two different agri-environment policies on landscape level and proves that agri-environment schemes with flexible payments based on spatial landscape configuration can be valuable for agri-environment policy development.

### **SESSION 3b: EVALUATION OF AGRI-ENVIRONMENTAL PAYMENTS**

#### ***Estimating the Causal Effects of the French Agro-Environmental Schemes on Farmers' Practices***

**Sylvain CHABÉ-FERRET**, Ingénieur, UMR Metafort (Cemagref - Engref - Enitac - Inra), Cemagref, Aubiere, France.

We present the first disaggregated estimation of the additionality and windfall effects of a nationwide Agro-Environmental Schemes (AES) programme on environmentally-relevant practices for a nationally representative sample of French farmers. We use Difference-in-Difference matching to estimate the extent of additional versus windfall effects of the French AES 2000-06. We also test the robustness of our findings confronting them with a credible alternative identification strategy. Our results suggest that voluntary AES programs that seek to reduce nitrogen use and encourage crop diversification may have large windfall effects. In contrast, more ambitious AESs such as conversion to organic farming, which combine strong requirements with large payments, seem to have achieved their goals. We cannot conclude on the extent of windfall effects of payments for extensive herding, because we find evidence of violations of the identifying assumptions for these AES.

We define the causal effect of the AES programme as the average difference between practices of participants in the presence of the programme and what their practices would have been had the programme not been implemented (*i.e.* the counterfactual situation). When trying to estimate this causal effect, we face a major problem since the counterfactual situation cannot be observed and thus has to be approximated thanks to observed data. Usual approximations are plagued by what may be large sources

of bias. The comparison of the participants' practices to those of non participants suffers from selection bias: it is likely that participants who self select into the programme would have adopted practices greener than the ones of the non participants had the programme not been implemented. All the same, the comparison of the participants' practices before and after the beginning of the program suffers from a time trend bias: the practices would have changed even in the absence of the programme since other determinants of farmers' practices as input and output prices have indeed changed between these two dates.

To correct for these two sources of bias, we use Difference-in-Difference (DID) matching to estimate the causal effects of the French AES. The main idea is to compare each participant to a non participant "twin" (i.e. a non participant with the same observed characteristics): if a sufficient number of characteristics can be used, the average difference between participants' and non participants' practices estimates the causal effect of the programme. This identification strategy relies on two main assumptions. First, for each participant a non-participant twin exists, which means that observed characteristics used for the matching are not the only variables explaining the participation to the program and that other unobserved characteristics exist (like managerial ability or environmental awareness). We combine matching with DID to correct for any remaining bias that may be due to these unobserved variables. This approach amounts to subtracting from the difference observed after the program was in place between participants and their "twins" the difference between the same farmers that existed before the programme was in place. Secondly, non participants' practices have not been altered by the programme.

Our results suggest that the size of windfall effects of the AES programmes depends on the specific prerequisites for each AES. For example, the AES supporting conversion to organic farming, which combined large payments with the strong requirement of not being an organic farmer when applying for the AES, have had negligible windfall effects. We cannot conclude on the extent of windfall effects of payments for extensive herding, because we find evidence of violations of the identifying assumptions for these AES. We make some suggestions aiming at improving the evaluation of future programmes. We argue that evaluation should be prepared at the same time the program is designed. This would improve the collection of data and enable using the first results of the evaluation to design the next programme (by suppressing or altering the less efficient AES). Finally, this could allow for the implementation of experimental methods to evaluate policies that do not comply with the assumptions of DID-matching, like payments for extensive herding.

### **Application of the Agri-environmental Footprint Index for the Environmental Assessment of Agri-Environmental Policy Schemes in Greece**

**Stamatios CHRISTOPOULOS** and **George VLAHOS**, Agricultural University of Athens

The Agri-environmental Footprint Index (AFI) consists of a methodology developed in order to assess the environmental performance of farms under Agri-environmental Schemes (AES). The methodology fuses the use of existing agri-environmental indicator systems and multi-criteria decision analysis through a participatory process.

A variant of the AFI approach, tailor-made and further developed in order to address the AES reality in Greece, was applied in two different farming systems under two AES regimes (organic farming in extensive olive groves and nitrate pollution reduction in intensive arable crop cultivation). The main objective of this exercise was the assessment and comparison of the environmental performance of farms participating in AES vs. the performance of non-participating farms.

The results were aggregated to single scoring composite indicators, linked to major environmental issues of the agricultural sector, accounting for natural resources, biodiversity, climate change and landscape. From an environmental viewpoint, aggregated scores show that the differences in performance between the two groups of farms are not significant, while, in a policy context, the outcome shows that the AESs in both case-studies exhibit a certain lack of additionality. At the same time, when assessing AES against environmental objectives pursued, it seems that the environmental outcomes produced, are aligned with the pre-defined policy aims in the case of organic farming, while for the other, any incurring benefits seem to be mostly of collateral character.

### ***Follow-up study on the Impacts of Agri-environment Measures in Finland***

**Jyrki AAKKULA<sup>1</sup>, Mikko KUUSSAARI<sup>2</sup> and Katri RANKINEN<sup>2</sup>**

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Since 1995 the agri-environmental policy has centred around the agri-environment payments part-financed by the EU. Through the measure under this it has been possible to influence the relationship between agriculture and the environment. The present agri-environment scheme is included in the Rural Development Programme for Mainland Finland (2007–2013), which both as such and through the legislation it is based on requires the follow-up of the impacts of the measures. One element in this work is the follow-up study on the impacts of agri-environment measures (MYTVAS 3) implemented in 2008–2013, financed by the Finnish Ministry of Agriculture and Forestry. The study is conducted by a consortium that is coordinated by the MTT Agrifood Research Finland (MTT) and, together with MTT, is comprised of the Finnish Environment Institute (SYKE), University of Helsinki (HY) and Finnish Game and Fisheries Research Institute (RKTL).

The aim of the MYTVAS 3 follow-up study is to find out how the agri-environment payments and various measures have influenced the state of agricultural environments, how the payments have influenced the preconditions for farming activities and how the agri-environment scheme should be developed in order to improve its effectiveness. Key focus in the follow-up is on the impacts of agri-environment payments on water loading and biological diversity.

When assessing the results presented and the recommendations for measures, it should be born in mind that the follow-up data may indicate that something has taken place but not necessarily the exact cause of the event. It is not always possible to show that certain trends would specifically be the outcome of the present agri-environment scheme and the application of measures under it. The time lag between a measure and observed impact is often long and the cause-effect relations are complex or partly unknown. In addition, the other aspects of agricultural policy and changes on the market influence the state of agricultural environments either directly or indirectly.

As regards their primary impacts, measures with the highest potential for reducing nutrient loading on waters are the basic measures concerning fertilisation of arable crops and nature management fields and additional measures concerning plant cover and fertilisation. The best measures to enhance biodiversity in agricultural environments are found among the contracts concerning special measures (management of traditional biotopes, promoting biological and landscape diversity, organic production, raising local breeds, cultivation of local crops) and non-productive investments (establishment of wetlands, restoration of traditional biotopes). The effectiveness of basic and additional measures in terms of biodiversity is quite modest, but this is to some extent compensated for by their extensive application. The continuation of farming as such is an important factor for landscape diversity.

The follow-up results show that, measured by nutrient balances, the nutrient loading potential of agriculture has been decreasing for the part of both nitrogen and, in particular, phosphorus. Primarily the reduction in nutrient loading potential has been due to the decrease in the use of artificial fertilisers. Instead, there are indications to the effect that leaching of nutrients of manure from centered animal production units is becoming a more serious problem. The basic problem in nutrient loading from agriculture is the separation of livestock and plant production from each other, which has made it more difficult to find appropriate uses for nutrients. The nutrient economy of especially grass cultivation works quite poorly. This is why focus should be on measures which increase the utilization of nutrients contained in animal manure as well as reduce the amounts of nutrients that end up in the manure.

The greatest threat to biodiversity derives from the trend in the landscape structure, where the most typical feature is the decrease in open or semi-open areas excluded from agricultural use proper. Clearing of islets on arable land and various kinds of margin areas, drainage measures to increase the cultivation area and all kinds of rationalization of field structures decrease the very areas that are the most important for the biodiversity of farming environments. The results of the follow-up study concerning specific measures show, however, that locally biodiversity benefits have been achieved in areas where the measures have been implemented to a sufficient extent (traditional biotopes, wetlands, riparian zones, green fallow/nature management fields). This is why it is particularly important to ensure that, on the scale of open arable areas, sufficient proportional shares of areas excluded from arable farming proper would be maintained in all farming areas, whether these are natural pastures, nature management fields, biodiversity strips, riparian zones, filter strips, field margins, islets on arable lands, etc.

The agri-environment scheme has had no negative impacts on the preconditions for agriculture. Despite the slight increase in the abundance of weeds, neither weeds nor substances used for their prevention have caused any problems that would call for changes to the content of the scheme. Compliance with the fertilisation restrictions under the scheme does not seem to have any significant impact on the quality of the crop. The variations in the weight of a hectolitre and a thousand seeds and protein content in 2006-2008 were about the same as in 1995-2005. Compliance with the fertilisation restrictions has not influenced the crop volumes very much, either. The average yields were about the same in 1986-2009 and during the 2000s no clear exceptions to the annual yield levels can be observed. However, it is also possible that the lower fertilisation levels during the 2000s have reduced the yield potential in years when the weather conditions have been the most favourable.

As a general conclusion we can say that, due to the considerable regional variation in the state of farming environments and needs of the society, there is a need to adjust and customise the objectives, measures and support levels of the agri-environment scheme more according to the regions, production sectors and individual farms. To achieve this, all farms included in the agri-environment scheme must have a farm-specific environmental management plan that specifies the nature values and most significant environmental risks of the farm and determines which of the measures would in the best possible way promote the preservation of nature values and management of environmental risks on the farm.

#### **SESSION 4. EVALUATION OF AGRICULTURE-ENVIRONMENTAL PAYMENTS – EU RURAL DEVELOPMENT PLANS 2007-13**

##### **Evaluation of Agri-environmental Measures in Flanders, Belgium**

**Michael Van ZEEBROECK**, Department of Agriculture and Fisheries, Brussels, Belgium

The Flemish rural development policy aims at improving the competitiveness of agriculture and improving the environment and the countryside by supporting land management. The quality of life in rural areas is encouraged by diversification of economic activities. The paper focuses on the evaluation of agri-environmental measures on biodiversity and the evaluation of the environmental effect of farm investment support (RDP measures: modernisation of farms and diversification into non-agricultural activities).

Farm birds: Over the past decades, farmland birds have drastically declined across Europe. In order to reverse this negative trend, the agricultural policy has undergone several reforms and measures to promote biodiversity have been introduced. For example, it is now possible for farmers to join agri-environmental schemes in which they are paid a fixed amount in exchange for carrying out prescribed conservation actions on their lands. In order to evaluate the current implication of agri-environmental measures in Flanders, a study was carried out by the Institute for Nature and Forestry Research to develop an appropriate monitoring scheme and to present a first assessment of farmland biodiversity in relation to these measures. The results indicate that, after accounting for differences in habitat quality between parcels, more species of birds and more breeding territories were present in areas with a higher density of agri-environmental schemes aimed at conserving meadow birds. A positive correlation between bird abundance and diversity and the presence of agri-environmental schemes was only found if there was a density of these measures in the landscape surrounding a land parcel. In order to unambiguously assess the effectiveness of agri-environmental measures, longer-term data on population trends are indispensable, as the analysis of such time trends allows a direct comparison of biodiversity trends on plots with and without conservation schemes.

Environmental impact of investment support: Environmental impact studies of new techniques of the Flemish Institute for Technology Research (VITO) were used as a starting point for the development of the environmental indicators to monitor the environmental impact of RDP farm investment support. The investments specific indicators that were developed are situated on the output indicator level. These output indicators were added to an administrative database. Out of the output indicators it was possible to calculate some impact indicators. The following results were obtained: the farm investments support for the 2007-mid-2010 period results every year in a prevented energy consumption of approx. 609 GWh (7.5% of the total energy use for the agricultural and horticultural sectors in Flanders in 2006), a prevented tap water consumption of approx. 993,000 m<sup>3</sup> (1.5% of the total water consumption for the Flemish agricultural and horticultural sector in 2006), a prevented ammonia emission of approx. 670 000 kg NH<sub>3</sub> (1.6% of the total ammonia emission of the agricultural sector in Flanders in 2006), a production of renewable energy of approx. 55 000 MWh (0.7% of the total energy consumption of the entire agricultural and horticultural sector in Flanders), a prevented greenhouse gas emission of approx. 541 000 tonnes of CO<sub>2</sub> equivalents (5.6% of the total greenhouse gas emission in 2006 by the Flemish agricultural and horticultural sector).

### ***Evaluating the Second Axis of the Estonian Rural Development Programme 2007-13***

**Ramon REIMETS**, Department Chief Specialist of Agri-Environment Bureau, Rural Development, Estonian Ministry of Agriculture

Monitoring and evaluation of the ERDP is based on the requirements of Council Regulations (EC) No



1698/2005 and 1974/2006, The Common Monitoring and Evaluation Framework (CMEF) and “Procedure for the monitoring and evaluation of the ERDP 2007-13” (a national procedure). The Ministry of Agriculture (the ERDP Management Authority) is responsible for the co-ordination and functioning of the monitoring and evaluation system. The Agricultural Registers and Information Board (ARIB) is responsible for gathering of the monitoring information, entering the information to the electronic information system and forwarding the information to the MoA, ongoing, mid-term and ex-post evaluators. The ongoing evaluation process of the ERDP is divided between two different ongoing evaluators - I, III and IV axis of the ERDP is evaluated by the Estonian University of Life Sciences; II axis of the ERDP is evaluated by the Agricultural Research Centre.

The main evaluation of the Agri-Environmental policy is going through the monitoring and evaluation of Rural Development II axis (Improving the Environment and the Countryside) measures. This process is conducted on the basis of the common baseline, input, output, result and impact indicators, described in the ERDP. The basic monitoring information is entered into the common electronic information system by the Paying Agency (the ARIB) and the relevant data is stored there. An assessment of the implementation of the II axis measures is given through ongoing studies conducted by the Agricultural Research Centre annually.

### **The Evaluation of the Austrian Agri-environmental Programme**

**Anja PUCHTA**, Federal Ministry of Agriculture, Forestry, Environment and Water Management, Vienna

Austria has a long tradition of granting compensatory payments to farmers. The Austrian agri-environmental programme, also called “ÖPUL”, supports agricultural production methods compatible with the requirements of environment protection, extensive production and the maintenance of the countryside. Every year the state spends approximately 550 million euro on the programme. The liability lasts for 5 to 7 years; the annual payments refer to one hectare or one animal. The acceptance among the farmers is very high: 89% of Austria’s agricultural area is ÖPUL area and 73% of the farmers are taking part in the programme.

The main objective of the programme is the protection and the improvement of all environmental goods. The evaluation system is excellent and aims to the protection goods biodiversity, water, soil and climate. (e.g., one of the evaluation results is that organic farming has a positive effect on biodiversity of weed).

### **Evaluation of Agri-environmental Measure in the Czech Republic: Evolving Concept**

**Jaroslav PRAZAN**, Head of Agro-environmental Policy, Institute of Agricultural Economics and Information

Monitoring and evaluation of all policies do not have tradition in the Czech Republic and therefore also experience is not rich. The first reason is it was prohibited for decades before 1990 and several mindsets remained for some time in administration. Therefore the demand for independent evaluation was not demanded by administration for a long time. The change came after EU accession because most of the

policies should be periodically reported to European Commission. There are difficulties in the process of evaluation and these are different from natural resource to another. There is a number of agri-environmental policies which deserve proper impact monitoring and evaluation and there is great asymmetry in effort in this part of the policy cycle. Evaluation of measures under Nitrate Directive is carried out quite regularly and especially output indicators and pressure indicators are monitored rather well. This is not the case with other agri-environmental policies.

The most difficult is to evaluate agri-environmental schemes targeted at biodiversity and landscape. The history of monitoring is quite short. Biodiversity is compared in organic/integrated vineyards with conventional ones from 90s but not regularly. Regular monitoring of birds, plants and insects is carried out only for three years and the effort proved that the task is difficult and costly. The difficulties stem from the design of the monitoring because the schemes are rather diverse and therefore it is not easy to decide which of them to monitor under budgetary restrictions. Then it is difficult to find control plots with great ecological similarities and not touched at the same by other agri-environmental policy (there is rather high uptake of this policy). Another issue is the experience of those who carry out the monitoring, which is evolving and growing capacities of botanists distort the results. In general budgetary restrictions do not allow monitoring sufficient number of sites to get statistically robust data. On the other hand the monitoring methods and concept for evaluation employed is well based on ecological principles and sounds reliable and promising. Those biotopes with sufficient sample plots already give impression the measure is effective in supporting biodiversity. Therefore after the sufficient experience is gained and sufficient number well selected monitoring sites is selected, the system could give strong arguments on the effectiveness of the agri-environmental measure for biodiversity.

But there is still issue concerning explanation of the impact in terms of policy effectiveness. Those who carry out the monitoring are not policy analysts and sometime have difficulties to judge the results of monitoring against the goals and targets of the policy in concern. The first issue is that policy makers tend to define policy goals and targets in vague way. When the goal is measurable, then it uses output indicators (e.g. area under particular management). There are hardly any impact indicator for final evaluation of the policy used in case of agri-environmental measure. The second issues is that sometime the goals are “to maintain” the habitats in valuable state or extensive management. But evaluators sometime do not take the real goal into consideration and when not detect any improvements on the habitats they tend to judge the policy as not successful.

Separate issues are to answer the questions: why the measure failed and what to do to improve the policy. In order to answer these policies evaluation of the policy should be done with this purpose. The paper will also briefly present reasons for low effectiveness of agri-environmental policy targeted at biodiversity in the case of the Czech Republic.

## **SESSION 5. EVALUATION OF ENVIRONMENTAL STANDARDS, ENVIRONMENTAL TAXES AND TRADEABLE PERMITS**

### ***Cost Effectiveness of CAP Greening Measures. An ex-ante Evaluation in Italy***

**Andrea POVELLATO and Davide LONGHITANO,**  
Istituto Nazionale di Economia Agraria (INEA), Rome.

A new policy tool for farms that aims to create a new market for ecosystem services provided by agriculture has been analysed. We quantify the potential regional supply curve of ecosystem services, using as a proxy the amount of carbon that could be sequestered with permanent grassland. A minimum data approach has been applied to integrate the spatial heterogeneity of the agro-systems with economic parameter collected through FADN in a case study area (Veneto, Italy). The simulation allows comparing three policy tools (agri-environment payment, regulatory standard and tradable permit). Results suggest that tradable permits (floor and trade) could be more efficient than policy based on direct payments or mandatory standards, although the largest provision of ecosystem service (carbon sequestered) has been achieved with mandatory mechanism.

### ***Costs and Benefits of More Environmentally Friendly Manure Handling in Norway***

**Frode LYSSANDTRÆ**, Senior Adviser, Ministry of Agriculture and Food, Oslo.

Meat and milk production is an important part of Norwegian agriculture. Good handling and use of manure is therefore an important challenge in minimizing the losses of nutrients from the sector. Phosphorus run offs is a challenge in some Norwegian waterways and is a part of Norway's implementation of the Water Framework Directive in the EU. Losses of nitrogen to air is becoming an important challenge both in regard of greenhouse gases (N<sub>2</sub>O) and as ammonia, and the storage of manure is also a source to methane emissions which is also a greenhouse gas.

Today the handling of manure is mainly regulated by a regulation for organic fertilizers, but in the last few years Norway also have had a pilot project with a per hectare based payment for more environmentally friendly manure spreading. The payment was introduced as I pilot study in some areas to better get an overview of the cost and benefits of more advanced spreading techniques. The Ministry of Agriculture and Food is now in the middle of a revision of the regulation and an evaluation of the pilot project. We will present some of the cost en benefits we have found in our evaluation, and elaborate on some of the lessons we have learned in the process of our evaluation.

### ***Effectiveness and Efficiency of Agri-environmental Policy Measures for N Surplus Reduction in Germany***

**Bernhard OSTERBURG, Wolfgang ROGGENDORF, Thomas SCHMIDT**, Johann Heinrich von Thünen Institute (vTI), Germany

The reduction of nitrogen surplus of the farm sector is an important objective of agri-environmental policies in Germany. Nitrate in groundwater stemming from agricultural sources constitutes a major challenge for achieving the targets of EU Water Framework Directive. Ammonia emissions of the farm sector account for a large part of total pollutants causing acidification and eutrophication. In this paper the role of legislation for control of N surplus will be analysed as well as environmental cross compliance as means for enforcement of statutory management requirements. Further, outcomes and cost-effectiveness of agri-environmental measures contributing to the reduction of nitrogen pollution are assessed. In many cases, these measures are an element of co-operative water management approaches, flanked by technical advice. The complexity of the existing policy mix constitutes a challenge for policy evaluation.

### ***Socio-political Conditions for Successful Water Quality Trading in the South Nation River Watershed, Ontario, Canada***

**Dennis O'GRADY**, General Manager, South Nation Conservation, Ontario, Canada.

The South Nation River watershed has a regulated water quality trading program. Legally, wastewater dischargers must not discharge any increased loading of phosphorus (P) into receiving waters. New wastewater systems are now choosing trading instead of traditional P removal technology, and point source dischargers are buying P credits from rural landowners, primarily farmers. These credits are generated by constructing nonpoint source pollution control measures. Mathematical formulae are used to calculate the credits of P removed by each measure. A successful trading program requires several conditions, including community agreement, legislative backing, credit and cost certainty, simplified delivery and verification, written instruments, and legal liability protection. South Nation Conservation, a community-based watershed organization, is the broker handling the transactions for these P credits. The program is run by a multi-stakeholder committee, and all project field visits are done by farmers and not paid professionals. An independent evaluation showed higher opinions for the broker and regulatory agency, and most farmers were willing to, or had already, recommended the program to other farmers.

### ***Agri-environmental Policies in Brazil and Perspectives for Evaluation***

**Matheus A. ZANELLA<sup>1</sup> and Lea V. CARDOSO<sup>2</sup>**

1. Humboldt-Universität, Germany,
2. Socio-environmental Institute (ISA), Brasilia, Brazil

Brazilian policy-makers are not used to refer as agri-environmental policies to a number of different policies marked by the interaction of agriculture and environment. We describe and classify eight Brazilian policies that suit a practical definition of agri-environmental policies commonly used by OECD country members. Four of these policies, selected due to their importance to agricultural and environmental agendas, are described in details, emphasizing policy monitoring and evaluation mechanisms and methodologies: i) the Low Carbon Agriculture Plan, ii) the Amazon Fund, iii) Payment for Environmental Services projects, and iv) the Forestry Code. Given the relatively freshness of these policies, full and comprehensive ex-post evaluations are exceptions, even though most of these consider monitoring mechanism and ex-ante evaluations in their intervention plans. Besides, relatively low concern is given to apply methodologies that could disentangle the impact of policy measures from external effects. We conclude that these policy innovations represent a turning point into more use of economic instruments in Brazilian agri-environmental policy-making and that, albeit with important exceptions, better inter-agency coordination is required to design more efficient policies.

## **SESSION 6. EVALUATION OF POLICY MIXES AND OTHER APPROACHES**

### ***Evaluation of Cross Compliance in England***

**Alastair JOHNSON**, Head of Agri-Environment Analysis Theme Group, Farming and Food Group, DEFRA, UK.

Cross Compliance was introduced in 2005, setting baseline standards that farmers must respect in order to receive their Single Payment under the Common Agricultural Policy. There are two elements to cross

compliance: Good Agricultural and Environmental Condition (GAEC) standards largely relating to the protection of soils, habitats and landscape features; and Statutory Management Requirements (SMR) which are either pre-existing legislative requirements or those that Member States must implement under EU law. SMRs cover environmental, public, plant and animal health and, from 2007, animal welfare objectives. The commissioned study looked the effectiveness of cross compliance in England in meeting its objectives, what is the nature and magnitude of the costs imposed on farmers and any others in meeting cross compliance conditions, does the policy represent good value for money, are there any unintended consequences, and has there been since the introduction of cross compliance a change in farmers' behaviour. The study used both primary and secondary data as well as benefits transfer in order to value the benefits. The study was undertaken by ADAS, Central Science Laboratory (CSL) and the Countryside and Community Research Institute (CCRI).

### ***A Policy Evaluation of Environmental-Friendly Direct Payment Programs in Korea***

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As fundamental externality cannot be applied within the price mechanisms of the market, in theory the use of a direct payment system is justified as a form of government intervention and policy incentive for positive externalities. In addition, in light of intensified limitations on government intervention by WTO standards, the Environmentally Friendly Direct Payment Program (EFDPP) has emerged as the most effective means by which to preserve the environment. Since the EFDPP was introduced in Korea in 1999, both farmers and officials involved in policy administration have evaluated it highly as a positive program for environmentally friendly farming. This paper reviews relevant theory, background, and objectives of the EFDPP and the results of its implementation. Evaluation criteria and surveys of both policy makers and beneficiaries are employed to gauge the effectiveness and suitability of policy measures. The analytical results are then employed to formulate suggestions for improving the role of the EFDPP as a cross-compliance environmental policy program.

### ***Promoting Collective Actions in Implementing Agri-environmental Policies: A Conceptual Discussion***

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It has been recognised in many countries that promoting collective actions would be a key to improving the effectiveness of agri-environmental policies as well as increasing the efficiency by reducing transaction costs. However, institutional arrangements to promote collective actions have not been observed in most countries. The presentation would focus on major policy issues associated with promoting collective actions and proposing areas for further studies.