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# **International Trade, Agricultural Policy Reform and the Multifunctionality of European Agriculture: A Framework for Analysis**

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# **International Trade, Agricultural Policy Reform and the Multifunctionality of European Agriculture: A Framework for Analysis**

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## **Introduction**

The main objective of this strand of ENARPRI was to clarify how far it is possible for agricultural economists to develop robust analyses to reflect the perceived importance of supporting a multifunctional model of agriculture with the enlarged European Union (EU) in the context of the ongoing round of multilateral agricultural negotiations. To that end, it is necessary to revisit issues of multifunctionality and its meaning in a trade perspective, drawing upon theory and the political rhetoric (Section 1). From this overarching analysis, we move on to consider how agricultural trade agreements, Doha in particular, are likely to affect the multifunctionality of European agriculture (Section 2). This question is addressed principally through examining the likely impacts of trade agreements upon the policy instruments of the Common Agricultural Policy (CAP), including changes to export refunds, import tariffs and guaranteed prices, as well as the scale and nature of domestic support. Analyses are performed for various European Member States, essentially because the available models to date have been developed at this geographic scale (country case studies). The analyses also cover a varying number and range of indicators of multifunctionality.

## **1. Agricultural policies and multifunctionality: A trade perspective**

### **1.1. What is multifunctionality?**

In a nutshell, the multifunctional character of farming can be defined as follows. Agriculture is an activity which provides a mix of conventional marketable goods such as food and fibre and a bundle of non-food and non-fibre outputs which are not marketable in conventional terms. These non-food and non-fibre outputs can be either benefits/goods (e.g., biodiversity preservation) or costs/bads (e.g., biodiversity loss). Most of these non-food and non-fibre outputs have positive/negative externality or public good/bad characteristics. An externality arises when the action of one economic agent influences either the well being of another

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consumer or the production possibilities of another producer in an indirect way, i.e., in a way which is not transmitted by market prices. Pure public goods/bads are defined by two characteristics: they are non-rival (consumption of the good/bad by one person does not reduce the consumption available to another person) and non-excludable (once the good/bad has been provided to one consumer, it is not possible to prevent other people from consuming it). All pure public goods/bads are externalities, but all externalities are not public goods/bads. As agricultural producers do not reap all the benefits of the positive spillovers they provide and do not support all the costs associated with the negative spillovers they generate, any market-led situation is likely to be characterised by an under-production of positive externalities / public goods and an over-production of negative externalities / public bads, with respect to the socially optimal level of provision. These are the classic cases of 'market failure' which may provide the legitimacy for public intervention to correct them.

The choice of policy instruments that can be used to correct market failures in respect of multifunctional goods and bads needs to consider at least three important factors. First, the efficiency criterion, i.e., how can failures be corrected in the most efficient way with regard to the use and allocation of resources, including administrative resources? Second, the redistribution effects, i.e., how will the policy alter the distribution of resources and incomes between actors and does this redistribution match social perceptions of equity? Third, the trade distortion effects, i.e., which policy instruments will have the least impact in terms of distorting trade?

A strict application of welfare economic theory would lead one to address externalities and public goods/bads following the targeting principle, that is, one policy instrument per market failure. This would consist of letting market forces freely determine the level of trade, consumption and production of private (marketable) goods while simultaneously addressing externality and public goods/bads provision through targeted policy instruments, decoupled from production of commodity outputs and coupled only to the provision of non-commodity outputs.<sup>2</sup> This simple and intuitive recommendation immediately raises the very difficult and to date only very partially resolved questions of identifying, measuring and valuing the externalities and public goods/bads associated with agricultural production. Because of this, and also because of jointness in production<sup>3</sup> and transaction costs, this recommendation may be, in practice, neither possible, nor desirable (optimal).

#### *Identifying multifunctionality: Impossible mission?*

The politic rhetoric has adopted a number of implicit meanings for the term multifunctionality. In almost all situations, use of this word embraces the full range of environmental impacts associated with agricultural activity. In some cases, notably for multifunctionality proponents within the World Trade Organisation (WTO), it also includes food security and the viability of rural areas, as well as some elements of social concern in relation to the culture, customs and networks of traditional agriculture-based rural areas (see, for example, Burrell, 2002).

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<sup>2</sup> In passing, one will note that the targeting principle leads one to decouple agricultural income support instruments from production choices and levels, here not to correct an exogenous market failure but to achieve an endogenous policy objective aiming at modifying the redistribution of national income in favour of agricultural producers.

<sup>3</sup> Jointness in production arises when commodity and non-commodity outputs are simultaneously (jointly) supplied – as is often the case with byproducts of agriculture such as biodiversity and landscapes.

Multifunctionality opponents recognise that there are external effects and/or public goods stemming from both food security and rural area viability. However, they do not accept that these factors are external effects associated with agricultural production. In the case of food security, the externality-generating mechanism would lie on the consumption side and agricultural production would be only a substitute for other sources of supply such as imports or stocks. In the same way, although the viability of rural areas can be related to farming, it is not an externality associated with agricultural production as the externality-generating mechanism is employment (Rude, 2000). What is clear from the previous analysis is that there cannot be an unambiguous resolution to the problem of identification (Bredhal et al., 2003). However, both multifunctionality proponents and opponents agree that agriculture generates negative and positive environmental externalities (OECD, 2001). Unfortunately, they generally disagree on the way these environmental externalities should be addressed.

### *Environmental externalities: from welfare theory to good practice*

In this subsection, let us temporarily assume that multifunctionality is limited to environment and that the environmental externalities associated with agricultural production can be properly and unambiguously identified, measured and valued (clearly, a very heroic assumption). Under these assumptions, what lessons can be drawn from economic theory, more precisely economic welfare theory?<sup>4</sup>

The first-best results are well known. If there is perfect information and competition in markets, free trade is socially optimal provided that corrective policies properly internalise the positive and negative externalities associated with farming. The second-best results are more interesting. If externalities are not adequately addressed, free trade may not produce the most favourable outcome. Nevertheless, even in this case, trade policies (export subsidies, import tariffs, import quotas, etc.) are unlikely to be optimal instruments to deal with externalities (Paarlberg et al., 2002; Glebe and Latacz-Lohmann, 2003). According to economic welfare theory, these externalities should be addressed through specific policies following the targeting principle. However, such specific and targeted policies may be very difficult to define and implement in practice.

Because the instruments that could be used to deal with externalities and achieve a given outcome are not unique, additional criteria need to be used to select the most appropriate instrument (or set of instruments) in any particular case (Fullerton, 2001). These additional criteria include administrative efficiency, the ease of monitoring and enforcement, information needs and uncertainty, political feasibility, equity and distributional effects, the presence of other distortions (imperfections in other markets) and flexibility and dynamic adjustments (i.e., the flexibility of governments to adjust policy rules as information, measurement and valuation improve, and the flexibility of the economy to adjust production of commodity and non-commodity outputs). Sensitivity to transaction costs is very important in influencing these considerations, too.

In the real world, we should perhaps be willing to accept that the targeting principle is very rarely either appropriate or achievable, as a goal. A growing body of contemporary evaluation suggests that policy packages are often the most effective and efficient approach to dealing with production externalities. These seek to achieve a balanced combination of basic ‘sticks’

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<sup>4</sup> For more details, see Guyomard and Le Bris, ENARPRI working paper 4, December 2003.

(regulation) to set minimum standards and ‘carrots’ (incentive) to reward provision beyond the baseline, accompanied by promotion/ awareness-raising/ training, education and extension activities (information, to minimise transaction costs). Often, as society’s understanding of the relationship between production and externalities develops over time, the level of the baseline will shift.

### *A broad definition of multifunctionality*

In the framework of ENARPRI, we retained a broad definition of multifunctionality essentially because our main objective was not to define optimal policies for a multifunctional European agriculture but to analyse to what extent agricultural trade agreements, and domestic policy reforms induced by these trade agreements, could have an impact on all non-commodity outputs provided by agricultural activity.<sup>5</sup> As a result, potential negative side effects of agricultural change upon multifunctionality include not only negative environmental effects but also effects upon employment and social cohesion, particularly in the context of marginal or depressed rural areas where farming still represents a significant percentage of economic activity and employment. If agriculture intensifies and capitalises in these areas, this can have negative impacts upon employment and community identity. This is a common pattern in several European regions (Spanish steppe agriculture, mountain agriculture, etc.): agricultural jobs contract, people move away or join the unemployed, and fragile communities disintegrate. Economists and national policy-makers frequently do not see these impacts as negative, but simply as issues of adjustment. By contrast, local policy-makers often perceive the impacts as a significant negative social side effect of a policy change. Of course, the outcome can be the same when agriculture extensifies and decapitalises leading to land abandonment and decreased agricultural production. In the same way, positive side effects of agricultural change upon multifunctionality can include positive environmental spillovers, and also increased viability of rural communities and food security. They may also include social elements like traditional rural customs, strong social capital, or unique cultural heritage.

## **1.2. Multifunctionality and multilateral agricultural negotiations**

When the Doha Round of multilateral negotiations was launched in November 2001, non-trade concerns were specifically recognised and integrated into the agricultural agenda, albeit to a limited extent.<sup>6</sup> Multifunctionality was at the heart of talks in the very beginning. But as time goes by, a question arises: is multifunctionality still a relevant question of the day?

### *Multifunctionality in the Uruguay Round*

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<sup>5</sup> It is also because our purpose is essentially positive that we do not discuss in this paper the two issues of non-commodity output measurement and valuation (on this point, see, for example, Bohman et al., 1999; Rude, 2000; Randall, 2002; Bredhal et al., 2003).

<sup>6</sup> Non-trade concerns and multifunctionality can be considered as synonymous. The URAA used the term of non-trade concerns instead of multifunctionality, but it did not provide a clear definition of the concept. This largely explains why there is still considerable confusion among WTO countries about what is really meant by the terms non-trade concerns or multifunctionality.

The WTO makes no judgements about countries' domestic agricultural policy objectives on condition that instruments used to achieve these objectives have no, at least minimal, trade distorting effects. From the Uruguay Round Agreement on Agriculture (URAA) of 1994, there is in effect an explicit recognition that domestic policies do link with international trade. In practice, the URAA classified domestic policies into three coloured boxes according to their perceived distortion effects on production and trade. The green box included domestic farm programmes that were deemed to be minimally trade distorting and as a result, were exempted from reduction commitments and expenditure limits. It was agreed that non-trade concerns should be addressed using green box instruments.<sup>7</sup>

### *Multifunctionality in the Doha Round*

The current round of multilateral negotiations was launched at the Ministerial Conference in Doha, Qatar, 2001. As far as agriculture is concerned, it has adopted a similar negotiation framework (export competition, market access and domestic support) as was adopted under the Uruguay Round. From the very beginning of the round, multifunctionality had its proponents and opponents. Proponents argued that production-linked payments are necessary to ensure a sufficient provision level of positive externalities and public goods to the extent that these externalities and public goods are joint products of agricultural production. They also wished an extension of the green box, i.e., more flexibility to classify new kinds of aid as green box programmes. By contrast, opponents argued that there is insufficient basis for continuing to offer production-linked payments. They invoked the policy-targeting principle and claimed that there is sufficient flexibility with the URAA green box definition for green box measures to be used to address all legitimate agricultural non-trade concerns.

### *Multifunctionality in agricultural trade talks: still a relevant question?*

The EU was the most important WTO member seeking more flexibility in the design of domestic policy relative to what was provided by the provisions of the URAA green box definition.<sup>8</sup> Japan, Norway, South Korea and Switzerland also took this view. However, the new reform of the Common Agricultural Policy (CAP) in June 2003 has led to widespread decoupling with cross-compliance requirements on income support payments. Modulation is also to be applied compulsory to achieve a (modest to date) switching of funds from first to second pillar measures. As a result, a large part of CAP domestic support may now be viewed

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<sup>7</sup> The URAA distinguished eleven categories of green box policies, that is (1) general services, (2) public stockholding for food security purposes, (3) domestic food aid, (4) decoupled income support, (5) government financial participation in income insurance and income safety-net programmes, (6) disaster payments, (7) producer retirement schemes, (8) resource retirement schemes, (9) investment aids, (10) environmental payments, and (11) regional assistance. Several categories of policies were designed to address non-trade concerns: food security for programmes (2) and possibly (3), environmental externalities (10) and the development of agriculture-based rural area programmes (11). Programme (4) was specifically defined to address the endogenous policy objective of agricultural income support. Programmes (5) and (6) may be interpreted as aiming to address market failures associated with risk and uncertainty, more precisely the incompleteness of risk and uncertainty markets. Finally, programmes (7), (8) and (9) were explicitly designed to ease adjustment and adaptation.

<sup>8</sup> The positions of the various European Member States on the multifunctionality dossier were, and are still, very heterogeneous. France was clearly the best friend of multifunctionality, essentially because such an attitude allowed French agricultural policy-makers and the main farmers' organisation to claim the maintenance of coupled area and animal payments and hence, to reject any further reform of the CAP in the framework of the so-called mid-term review of the Agenda 2000 CAP.

as meeting the criteria for eligibility under the URAA green box definition. If this view is accepted in the context of the current round, it may be asked whether the issue of multifunctionality is still relevant to trade discussions and considerations.

Following the Geneva agreement in August 2005, the Hong Kong Ministerial Conference in December 2005 resulted in a framework agreement for Doha. Detailed commitments have still to be negotiated however. The agreement covers the three areas of export competition (with a commitment to eliminate export subsidies by 2013), market access and domestic support. In relation to these three areas, given that export competition is now agreed as an important ingredient and EU agricultural domestic support could be viewed as largely in the green box, then market access may appear as the Achilles' heel of the June 2003-April 2004 CAP reforms. Despite the successive reforms of the CAP in 1992, 1999 and 2003, the world prices of many agricultural products remain much lower than domestic prices in the EU.

Although it is not possible to define precisely what will be in the final Doha Round Agreement on Agriculture, one can reasonably assume that it will have an impact on EU agriculture and this will be essentially through two transmission channels. Third-country imports should increase, due to their improved access to the EU market and European exports should decrease because of the suppression of export subsidies. This should have a negative impact on EU market prices and the domestic supply of agricultural commodities. But the Doha Round Agreement on Agriculture could also have an impact on EU agriculture by inducing (speeding up) further reforms of the CAP (for which there is very likely also to be domestic pressure, notably from enlargement and budgetary discipline). At the very least, the phased elimination of export subsidies would appear to make further dairy reform inevitable.

This means that for those who are genuinely interested in maintaining or indeed enhancing the multifunctionality of EU agriculture, the focus of interest in the trade negotiations and their outcome is in *how the agreement is likely to affect the balance of non-food benefits and costs generated by the farm sector across the EU*. This analysis needs to be made in the context of recent, significant policy change at EU level as represented by the 2003-2004 CAP reforms.

## **2. Assessing the effects of agricultural policy reforms on the multifunctionality of European agriculture**

In order to analyse the effects of the 2003-2004 CAP reforms and possible Doha outcomes on the multifunctionality of European agriculture, we need to identify:

- Multifunctionality indicators – what range and types of indicators can be used to measure multifunctionality, in all its different interpretations?
- Policy experiments – what scenarios for future domestic policies and prices can simulate the likely outcomes of Doha within the EU?

On the basis of these indicators and experiments, it should then be possible to undertake some impact assessment from which we hope to draw a concluding synthesis and discussion of policy implications.

## **2.1. Multifunctionality indicators**

From a literature review, in particular OECD (2001), we have identified six classes of potential indicators that are for a large part already incorporated into domestic policy impact assessments and thus can be used to examine the implications of change upon multifunctionality (for more details, see ENARPRI Working Paper 10, January 2005). These six classes correspond to:

- (1) Economic indicators (prices, supplies, exports and imports, farm or household incomes, etc.);
- (2) Primary factor use (capital, land and labour);
- (3) Environmental indicators (greenhouse gas, pollution by nitrates or fertilisers as a whole, pollution by pesticides, soil conservation, water management, biodiversity preservation, landscape preservation, etc.);
- (4) Agricultural structure indicators (number of farmers and farm workers, farm sizes and types, etc.);
- (5) Farm management indicators (set-aside areas, land abandonment, livestock density, etc.); and
- (6) Cultural and social indicators (agriculturally linked customs and events, percentage of rural population connected with farming, proportion of locally sourced food sold in rural areas).

There are significant measurement problems for many of these indicators, as well as potentially ambiguous interpretations for some of them depending upon how you value certain issues (such as the issue of declining farm employment which can be seen as a positive efficiency adjustment or a negative issue, notably in depressed rural areas). There is also an unequal coverage of the six classes of indicators in the existing range of available quantitative models. Aspects associated with cultural heritage and social capital/values are not included in any of the models and thus can only be estimated from ex-post qualitative (expert) assessment. In addition, domestic policies vary between countries due to the increased subsidiarity in CAP decision-making, which now affects the scale and pattern of support under both pillars. These issues give rise to a problem in the extrapolation of results obtained for one country to any other Member States.

A final remark is also needed. It is clear that the time horizon of simulations matters because environmental and social impacts from agricultural change frequently take some time to become fully apparent. Thus in general, our 'country case studies' have been undertaken with a medium term horizon of 2013-2015 in mind.

## **2.2. Policy experiments**

*The baseline: The June 2003-April 2004 CAP reform (S1)*

The June 2003-April 2004 CAP reform scenario is the baseline against which to assess Doha impacts. It must be remembered that this scenario gives rise to different implementation rules in each Member State (Single Farm Payment on a historical or regional basis, partial recoupling of some first pillar direct aids or use of national envelopes in a number of Member States, different requirements as regards cross-compliance and good agricultural and environmental practices, as well as the varying balance, focus and scale of second pillar schemes). For any single country where models exist, it is possible to examine the impact of the June 2003-April 2004 CAP reform on market prices, product supply and factor demand, intensification, land use, land abandonment, farm income, and more rarely the number and the size of farms. However, given that most models have primarily been developed to examine impacts of changes in first pillar market measures upon the agricultural sector, there are important limits to the degree of policy detail that the models incorporate. Cross-compliance and second pillar measures, as well as entry and exit from agriculture, are frequently not modelled.

*A fully decoupled June 2003-April 2004 CAP reform (S1bis)*

To contrast with this baseline, it is desirable to consider a fully decoupled June 2003-April 2004 CAP reform with no partial recoupling and common cross-compliance requirements. By comparing this alternative implementation of the June 2003-April 2004 CAP reform with the baseline, it should be possible, at least in theory, to assess the impact of the partial recoupling of some first pillar direct aids, as has been chosen in a number of Member States.

In both the baseline and the fully decoupled June 2003-April 2004 CAP reform scenario, trade instruments (export subsidies and import tariffs) are assumed unchanged at base period levels.

*A fully decoupled CAP - decoupling extended to milk, export subsidy abolition and improved access to the EU market (S2)*

The third policy experiment corresponds to a fully decoupled CAP extended to the milk and dairy sectors. Export subsidies are abolished and market access is gradually increased to 10 % of EU domestic consumption. This scenario represents the impact of a fully decoupled CAP in the context of a Doha agreement entailing export subsidy suppression, assuming the URAA definition of coloured boxes is retained (meaning there is no problem for the EU to respect its commitments on the domestic support dossier), and increased EU imports from third countries.

*A fully decoupled CAP with reduced decoupled direct aids (S2bis)*

In an attempt to capture the possibility that either as a result of Doha or beyond it, the Single Farm Payment is not accepted as a green box aid, it is interesting to examine the scenario S2 developed further so that decoupled direct aids are reduced by 20%. This scenario assumes thus that the EU is forced to reduce decoupled direct aids because of WTO commitments and/or because of domestic pressure, notably budget constraints (enlargement to Bulgaria and Romania, decoupling extended to nearly all supported sectors).

### *A fully decoupled CAP with resources shifted from the first to second pillar (S3)*

If the driving force for the scenario S2bis change were WTO, one could also consider a modification which would not reduce the overall support under the CAP but shift it between the pillars, i.e., a fully decoupled CAP with an increased share of resources devoted to second pillar measures. More specifically, this scenario S3 assumes that funds saved through a 20% decrease in pillar one measures are transferred to pillar two, in order to achieve environmental and social objectives.

This range of scenarios will be quite helpful in assessing the potential impacts of a Doha agreement on EU agriculture in different Member States, even if not all scenarios can be examined by all models. In tracking Doha progress to date, the existing level of decoupling seems assured while increased market access will probably compel further reforms and thus probably more decoupling. Export subsidies will be phased out and although, following the last agreement on the EU financial perspectives, there would not be a lot more EU funding for the second pillar there could be some interest among Member States in considering the scope for mitigating the effects of reform by using modulated money to target particular measures under pillar two, to increase the goods and minimise the bads.

### **2.3. The models for our study**

Most of the existing models used for assessing the impact of multilateral agricultural negotiations focus on prices, incomes, production and environmental outcomes. The multifunctional aspects of policy reforms are usually reduced to a relatively narrow set of indicators, mostly linked with environmental issues but some social aspects, notably farm employment, can also be considered. Table 1 gives a summary of the characteristics of the models used for this ENARPRI examination of multifunctionality.

In *Finland*, the team used the *DREMFIA model*, a dynamic regional sector model of Finnish agriculture, in which a technology diffusion model is combined with an optimization routine which stimulates annual production decisions (within the limits of fixed factors) and price changes. The scenarios examined included the actual CAP reform 2003 as implemented in Finland with some sectors still partially coupled, also full decoupling, and with the application of a simplified cross-compliance regime for compulsory arable field margins, as well as a scenario involving 20% cuts in CAP pillar 1 payments. The list of indicators applied in the model is longer than in any of the other models described/used by other ENARPRI partners (see Table 1). It includes: production levels, land use, nutrient balances, biodiversity index, use of pesticides, farm incomes and employment. However the model could not deal with a scenario involving the expansion of pillar 2 funding.

In *Ireland*, the team used a *FAPRI-Ireland model*, or a set of dynamic, multi product, partial equilibrium commodity models, built on a similar platform to FAPRI models developed in the USA. The Irish researchers examined the scenario of CAP reform 2003 implemented as full decoupling, versus an expected Doha outcome involving more market access and phasing out export subsidies. The indicators examined for multifunctionality included greenhouse gas emissions, forestry carbon sequestration, ammonia emissions and fertiliser usage. *FAPRI* is capable of dealing directly with the outcomes of international trade agreements rather than

having to transform these into domestic policy changes. Yet the Irish model is less readily able to deal with the implications of some of the domestic policy scenarios outlined in this paper, especially where they involve making assumptions about CAP pillar two spend and its effects.

In *Greece*, the team investigated changes using national and regional *Social Accounting Matrices (SAMs)* constructed to examine changes in the farm and non-farm sectors within these areas, in response to policy changes. They also examined all four specified scenarios for this project, because the approach included consideration of CAP pillar 2 impacts (it should be noted that in Greece, more than 70% of pillar 2 spending is on improving farm competitiveness (CEC, 2003). The indicators analysed were farm output, farm/other employment, agricultural land use, and levels of pollution emissions.

In the *Czech republic*, the team used a model called *FARMA – 4*, which is a non-linear optimising model based upon optimising behaviour of three main farm types, linked into certain multifunctionality indicators. The scenarios examined were the CAP policy as in 2002, full decoupling, or the expansion of a simple grassland-conserving agri-environment scheme across the country. The indicators tracked were employment, production types, stock numbers, grassland cover, fertiliser and energy use.

In overview, the various models and/or approaches applied by the ENARPRI team can cover all the scenarios. The biggest modelling difficulties clearly apply to scenario S3 because few models have adequate methods to represent the range of pillar 2 measures deployed. Wherever the models have difficulties, additional ‘ad-hoc’ information and qualitative/policy evaluative expertise can be used to examine multifunctionality implications. Thus it is indeed possible to seek to identify links between trade policies and multifunctionality impacts, albeit only at the level of individual EU Member States.

**Table 1. Main characteristics of the models used for examining multifunctionality**

<b>Country, model name and type</b>	<b>Scenarios modelled</b>	<b>Indicators of multifunctionality</b>
Ireland FAPRI-Ireland is a set of econometric, dynamic, multi-product, partial equilibrium commodity models	CAP reform 2003 with full decoupling as the baseline, compared to a Doha scenario with increased market access (60% average tariff cut), 70% cuts in amber box domestic support (AMS) and elimination of export subsidies over 10 years	Greenhouse gas emissions, ammonia emissions, fertiliser use, farm incomes
Finland DREMFA is a partial equilibrium recursive model with 17 production regions, combining technology diffusion with optimising producer and consumer returns	CAP reform 2003 with partial decoupling; full decoupling across all EU; new environmental cross compliance to create uncropped field margins on all arable land; 20% Pillar 1 cuts by 2013.	Production levels, agricultural land use, nutrient balances, biodiversity, pesticide usage, farm income, farm labour
Greece National and regional Social Accounting Matrices	All specified scenarios	Production levels, farm/other employment, agricultural land use, pollution emissions
Czech republic FARMA – 4 (linear programmes optimising production for given outcomes based on ‘typical’ farms)	Pre-CAP Policy as in 2002, compared to full decoupling or 100% uptake of an agri-environment scheme	Farm labour, farm types/systems, livestock numbers, grassland cover, fertiliser and energy use

### **Concluding remarks**

This paper has provided the context for the ENARPRI team’s work on the relationships between multilateral trade agreements and multifunctionality – specifically, examining implications for the multifunctionality of agriculture within the EU. Framed within this context, the country case studies contribute a wealth of data and potential insights into these implications and their likely outcomes in respect of a range of environmental, social and economic indicators. A final section in this strand of ENARPRI work is then the concluding paper which synthesises these findings and analyses their relevance to both the understanding of trade and multifunctionality interrelations, and to the domestic and international policy process.

### **References**

Bohman M., J. Cooper, D. Mullarkey, M.-A. Normille, D. Skully, S. Vogel and E. Young (1999) The use and abuse of multifunctionality. United States Department of Agriculture (USDA), Economic Research Service (ERS), Washington D.C, United States of America.

Bredhal M., J.-G. Lee and P.-L. Paarlberg (2003) Implementing multifunctionality. Contributed paper presented at the International Conference on “Agricultural Policy Reform and the WTO: Where are we Heading?”, Capri, Italy, June 23-26.

Burrell A. (2002) Multifunctionality, non-trade concerns and the Millennium Round. Paper presented at the SFER (Société Française d'Economie Rurale) Conference on "Multifunctionality", Paris, France, 22 March.

Commission of the European Communities (2003) Factsheet: Overview of the implementation of rural development policy 2000-2006 - some facts and figures (11/2003). CEC, Brussels, Belgium.

Dwyer J., D. Baldock, H. Guyomard, J. Wilkin and D. Klepacka (2005) Scenarios for modelling trade policy effects on the multifunctionality of European agriculture. ENARPRI working paper 10, January.

Glebe T., and U. Latacz-Lohman (2003) Multifunctionality and free trade: A formal analysis. Contributed paper presented at the AES (Agricultural Economics Society) Conference, Seale Hayne, United Kingdom, 11-14 April.

Guyomard H. and K. Le Bris (2003) Multifunctionality, agricultural trade and WTO negotiations: A review of interations and issues. ENARPRI working paper n°4, December.

OECD (2001) Multifunctionality: Towards an analytical framework; Executive summary. OECD, Paris, France.

Randall A. (2002) Valuing the outputs of multifunctional agriculture. European Review of Agricultural Economics, 29(3), 289-307.

Rude J. (2000) Appropriate remedies for non-trade concerns. CATRN (Canadian Agri-Food Trade Research Network) paper 2000-05.