Multifunctionality in Agriculture and its Compatibility with Globalization

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1. Introduction

Agriculture takes place under very different conditions throughout the world. Certainly this has to do with variations in natural environment - a factor of great importance for an activity like farming. The sector is integrated in different ecological systems. Its form and position reflect, however, also variations in economic development and in the sector’s social and political standing. While agriculture is a multifunctional undertaking, this reveals that the very substance of multifunctionality will have to vary from place to place, from country to country.

The strong trend of globalization over the last couple of decades, has introduced the issue of agriculture’s various functions to the international debate. Many of these functions have public good characteristics. Article 20 of the Agreement on Agriculture from the previous GATT/WTO negotiations focuses on some of these functions under the concept of non-trade concerns - i.e., food security and environmental protection. The concept of multifunctionality has also gained position lately, especially within the OECD (OECD 1998 and 2001). This concept does not only focus on the existence of public goods, but also on the fact that there are important links between the production of private goods like food and fiber and the creation of various public goods.

The term globalization may cover several features. In this paper I will use the term to deal with the tendency to create global markets for commodities to foster maximum growth in the economy. More specifically I will look at the issue of free trade across national borders. To the extent that relationships exist between private

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and public goods, there is a potential antagonism between welfare enhancement and free trade in private goods. In the following paper I will try to illuminate some of the issues involved here and evaluate a set of policy strategies.

I will start by looking at the relationships between globalization/free trade and the protection of environmental values more in general. Thereafter I will turn more specifically to the concept of multifunctionality. This will be done within a systems perspective and efforts will be made to clarify the various types of relationships that exist between agricultural commodity production and the production of public goods. Then I will present results from some analytical research we have undertaken concerning free trade of agricultural commodities in a situation characterized by multifunctionality. I will follow up by discussing the rights issues implicit in the results obtained from the analytical research, before I will conclude the paper.

2. Globalization, economic growth and the environment

Environmental issues - e.g., externalities - are not a focus of the classical trade model. This is partly due to the assumptions normally invoked. Since Ricardo it has been standard to assume only private goods, full competition in production, zero transaction costs, and non-mobile capital and labor inputs. In such a situation, a global system of free trade secures the highest level of economic growth for all parties (countries) involved.\(^1\) This is the doctrine of comparative advantage and minimal state involvement. Thus we observe that there is a direct relationship between globalization, free trade and maximal economic growth in the standard model.

This model is the basic fundament for advocating a global market for all private goods. The main debate so far about its relevance and correctness has focused on the structure of the economy - i.e., the assumptions concerning a competitive environment (oligopolies etc.) and that of mobile outputs, but immobile inputs (e.g.,

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1) There is certainly an important debate going concerning the distributional effects of globalization. To say anything sensible about this issue more specifications are necessary than those implicit in the 'ideal' trade model. This is, however, beyond the ambition of this paper.
Krugman 1990; Kaldor 1980). While these assumptions are of importance in the case of the environment as well, the most significant issues for us are the assumption that all goods are private and that transaction costs are zero.

Before I go more systematically into discussing the effect of allowing public goods and positive transaction costs to enter the model, I will cover the debate we observe concerning globalization, growth and environmental problems. We shall first look at the idea that enhanced growth is in itself able to eliminate or at least reduce the amount of negative environmental effects. We shall then look at the counter arguments of this hypothesis. This leads us to the more refined hypothesis that specific environmental policies are necessary, but that they can be instituted independently of the trade regime. Finally, I will present the counter arguments to this position as an introduction to the more specific debate concerning multifunctional agriculture.

2.1 Enhanced growth is good for the environment - the hypothesis of self-correction

The first position to visit concludes that enhancing free trade and thus growth, will eventually result in reduced environmental problems. This reasoning is built on the idea of the so-called 'environmental Kuznets curve' (EKC). The EKC hypothesis claims that while negative environmental effects increase with growth up to a certain level of GDP, they will tend to decrease with further increase in production - see Figure 1. Thus, more growth and by implication more trade and globalization may be the solution to, not the cause of the problem.2

To evaluate this hypothesis, we need to look more directly at the mechanisms involved. The arguments in favor of unregulated competition/free trade involve four types of mechanisms:

1. Competition will tend to reduce the amount of resources used per unit of production with a corresponding reduction in potential pollution (Jackson 1998).
2. In a free trade environment, production will be located in places with the best natural conditions (Esty 1994; Anderson and Strutt 1996; Runge 1998).
3. Demand for environmental ‘commodities’ increases with income (Cole 2000,

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2) For a more full review of the literature on this see Ekins (1997) and Cole (2000).

4. Free trade may prevent governments or trade unions from introducing environmentally unfriendly production subsidies (Anderson 1992).

In sum, the two first arguments imply a potential for reduced environmental stress as compared to a situation with less competition. Together with point 3, they form the basis for the 'invisible environmental hand' of the EKC hypothesis. The second point implies some regulation, though - i.e., the establishment and defense of a free trade regime. The fourth point concerns policy more directly.

![Pollution per capita vs. GDP per capita](image)

**Figure 1. The 'environmental Kuznets curve' hypothesis**

Certainly, some evidence exists for the EKC hypothesis - i.e., for a subgroup of pollutants with local distribution only (Cole 2000; Ekins 1997). Still, it may not be the effect of growth per se, but changes in environmental policies that explain the observed reductions in environmental stress (Arrow et al. 1995). Concerning this latter point, there is great confusion in the literature. For the 'invisible hand-type' of EKC reasoning to hold, it is individual market demand - point 3 above - that should be the driving force. In the cases where the EKC hypothesis is verified, it seems like political initiatives have been crucial to obtaining reduced environmental stress. This has not least to do with the high transaction costs involved when doing market transactions for environmental goods or bads.
2.2 The critique of the self-correction hypothesis

There is thus a long range of counter arguments presented in the literature. These can be listed as follows:

a) While competition and trade may reduce the use of some resources - i.e. those that have a price - they will not reduce, but rather increase the use of all those environmental resources that are provided for free (Arrow et al. 1995; Ekins 1997).

b) While competition may reduce the use of priced resources per unit produced, the total number of units may increase ('income' effect) and more than outweigh the positive per-unit effect (Jackson 1998).

c) Free trade obstructs the possibilities of national governments to introduce environmental regulations - especially in the case of international pollution (Esty 1994, Haavelmo and Hansen 1991; Røpke 1994).

d) As far as the EKC effect is observed, it is not the effect of self-correction, but of the formulation of specific policies (Arrow et al. 1995).

e) Trade may in itself produce negative externalities following from transportation and regional specialization, etc. (Rauscher 1997; Røpke 1994; Vatn and Bromley 1997).

f) Free trade may impede the production of public goods that are jointly produced with private ones (Vatn 2002a; Vatn et al. 2002).

It can be seen that the listing a) - f) accounts for arguments that are directly in opposition to one or more points given in points 1 - 4. Combined, the arguments a) through f) also point at the aggregated effect of growth on the capacity of the total environmental services of the world (Daly and Cobb 1989). As far as economic growth involves the use of more natural resources in specialized production systems - i.e., more detached from the existing natural dynamics - the aggregate effect may be increasingly negative, even though each product unit in isolation is produced with less use of physical resources.

2.3 Separating trade and environmental policies

Many economists support the arguments under points a) and d) above. They thus argue that one cannot trust the various self-correcting mechanisms that are assumed
to exist. The dominating version of this position is still to favor free trade. The strategy favored is to separate free trade and environmental policy.

Anderson and Blackhurst (1992) are very distinctive representatives of this position. According to them "... the impact of trade and trade liberalization on a country's overall welfare depends on whether the country's environmental resources are correctly priced, which in turn depends on whether appropriate environmental policies .... are in place. If they are, trade and trade liberalization benefit the environment because the resulting increase in economic growth stimulates the demand for environmental protection and generates additional income to pay for it" (ibid., 19). Thus, if the appropriate environmental policies are in place, trade will gain the environment.

The challenge for this position is to prove that there are no or at least not sufficiently large direct or indirect effects of free trade on the environment to favor regulation via trade rules themselves. Alternatively, one has to show that regulating the effects of trade is simpler and cheaper than regulating trade itself.

2.4 The insufficiency of separation

The answer to these issues depends on the type of relationships involved. If externalities are a minor phenomenon and easily corrected for, the rational response seems to be that of Anderson and Blackhurst. The situation is different, if they instead are pervasive. If there are time lags from the creation of the source of an externality - let's say an emission takes place - until the effect can be observed, the problems with simple internalization are furthermore enhanced (Vatn 2002b). Let us develop the argument by looking at this in relation to agriculture more specifically.

Transport is of great importance for international trade not least in food commodities. To be able to internalize the environmental effects of transport, a global regime is needed. While many countries have regulations within their borders, transport between countries is not taxed. This illustrates the problem with just assuming rules not least for trans-boundary pollution to be in place.

Specialization - the fundament of globalization - is at least in the case of agriculture a double-edged sword. It is the very basis for the potential gains from trade, but will also by necessity result in breaking local cycles of matter and
energy. In the past few decades we have experienced many effects from specialization. A prime example is the huge amounts of organic waste in areas with high animal densities, basing much of their production on imported feed. In principle one may envision a globalized system where feed is produced at some locations, the animal production at others, and the consumption at yet a third type of place. The human made and natural systems are strongly detached, and this structure may create enormous waste problems in the end.

The recent outbreaks of foot and mouth disease are stark examples of a third type of problems. In this case, the externality may be directly associated with what is traded, and the volume of trade will directly influence the quality of the food production systems.\(^3\) Furthermore, the issue has been raised whether the high level of competition itself is a source of increased frequency of events of diseases and toxins in food. They may be a direct result of ways sought to reduce costs in an increasingly tougher economic climate.

The problem with the 'separation strategy', as previously described, is here actually encountered at two levels. First, it normally takes (long) time from when a production process that produces externalities is established until the environmental problems it creates are observed and scientifically proved. Actually it is an important asymmetry involved here. The gains from trade - specialization - are immediately achieved. The costs of environmental degradation become visible much later.\(^4\) At this latter stage, the investments undertaken under the assumption that no harm will be done may be huge. They will then influence future costs of remediation and affect what becomes optimal to do at the time the problem is

\(^3\) See among others Altemus et al. (1997), Silverglade (2000), Skjerle and Wasteson (1999).
\(^4\) Actually, this time lag may very well explain the environmental Kuznets curve. Over time the effect of production and consumption on the environment becomes gradually visible. Thus it is reasonable to expect that the curve for some type of problems starts to bend down when policies have come in place to counter the previously unknown effects. Following this reasoning, it is not the growth in GDP that explains the relationships in Figure 1 - if observed. It is not even its effect on the willingness to put policies in place that gives the explanation. Instead we just observe a time lag where one, in the early phases of economic growth, goes on as if there is no problem. After some period problems become visible and policies are put in place. The fact that GDP has meanwhile increased is then still only a cause to the problem and not a solution. The relationship in Figure 1 is spurious according to this reasoning.
scientifically recognized (Vatn 2002b). Internalizing externalities under a ‘separation strategy’ is thus no simple recipe. What becomes optimal to do will furthermore depend on who in the end bears the burden of proof and which type of environmental regulations the trade regime accepts.5)

Second, if it is trade itself that creates the externalities (the public goods or bads), it seems inappropriate to create a two-stage analysis, where one first generates the conditions for free trade and then afterwards tackles the resulting external effects separately. In my view, we economists tend to handle too many issues or processes as if they were independent of each other. This is not least the case with environmental issues.

In the rest of the paper I will follow up on the issue of interdependency as applicable to the field of multifunctional agriculture. More specifically I will present some results from a formalized analysis where we have looked at public goods and bads that are the joint outcomes of the production of private goods. Furthermore, I will introduce the issue of transaction costs, which both in itself and in cases with joint products may have a strong effect on what in the end are rational policy approaches. As emphasized already in the introduction to this chapter, gains from trade do not apply if interdependencies and transaction costs are involved.

3. Multifunctional agriculture

3.1 Clarifying the concept

Multifunctional agriculture is a rather new concept and there is naturally some debate about its definition. OECD makes the following clarification:

“Multifunctionality refers to the fact that an economic activity may have multiple outputs and, by virtue of this, may contribute to several societal objectives at once. Multifunctionality is thus an activity oriented concept that refers to specific properties of the production process and its multiple outputs” (OECD 2001: 11).

5) See Vatn and Bromley (1997) and Vatn (2002b) for an elaboration of the above arguments. The burden of proof issue is also touched upon in Chapter 5 under the issue of rights.
I would like to add that these outputs normally consist of a mix of private goods (food and fiber) and various public goods. It is this combination that creates special challenges for public policy. To complete the picture, the definition of multifunctionality should comprise not only public goods, but also public bads - i.e., that some of the functions or effects may have negative consequences for welfare.

The following elements constitute a representative list over the various public aspects of a multifunctional agriculture:

- Environmental effects
  - Landscape (biological diversity; recreation; aesthetics)
  - Cultural heritage
  - Pollution (changes in matter cycles; genetic pollution, etc.)
- Food security (availability in different situations)
- Food safety (quality/phyto-sanitary status)
- Rural concerns (rural settlement; rural economic activity)

It is important to acknowledge that the various goods and bads are components of an integrated production system. They often appear as linked sets of outputs or even functions. While some of the listed aspects may also be produced independently of agriculture, we cannot envision an agriculture that does not affect the status of all elements in the above list. In this sense, all the listed public goods/bads are dependent on primary production. They are characteristics of the system as a whole. This certainly stems, to a large extent, from the fact that agricultural production is directly interlinked with the eco-systems it operates within and the space it uses. While the dynamics of these relationships varies across ecosystems and thus regions of the world, the idea that it works through the combined use of inputs - both traded and non-traded - is generally applicable. This is illustrated in Figure 2:

On the input side, the figure distinguishes between inputs that are (easily) traded (x1) and those that are not (x2). Traded or private inputs have characteristics making them easy to demarcate and thus easy to trade. The non-traded inputs are often public/common pool resources - like water and air. Land is included in the category of non-traded goods. This is because land is often reallocated between productions without trade taking place.6)
Inputs are combined in different production processes. Out of these come sets of outputs in the form of tradable goods (y), and public goods and bads (z). Given that matter cannot disappear, all resources that are put into the production process must in the end appear as outputs of one form or the other - i.e., either as a private good (commodity), a public good or a public bad (see also Baumgartner 1999).

Outputs may be joint, complementary or competing. Jointness implies that when an enterprise produces more than one output, inputs cannot be assigned specifically to each output. Thus, the production function includes all outputs as a function of the inputs (Frisch 1971; Gravelle and Rees 1981). Jointness can cover both goods and bads, which in principle can be both private and public.

In the case of complementarity, the production of one good contributes an element of production, which is joint with this first good and required in the making of a second good (Heady 1952). This is illustrated by the arrows (a) and (b) in Figure 2. The effect on the joint production factor could, in principle, be both negative and positive. A classical example in agriculture is the production of

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6) While for some inputs like fertilizers, measures (e.g., taxes) can be directed at the point where the resource is traded, this possibility is restricted in the case of land. The implications of this will be discussed later.

7) Heady (1952:222) offers two more definitions of which one is a variation over the one used here.
hay, which contributes positively to soil fertility (joint product with hay), hence increasing future grain productivity (complementary product). Complementarity occurs normally within certain ranges. Beyond these ranges the two products compete over the common factor of production.

We have made a distinction between private and public goods. There are at least two reasons why a good may be considered public\(^8\). It may be found politically or ethically correct to provide a good to everybody free of charge. Secondly, it may be too costly to demarcate the good so that it is only accessible to those that pay specifically for it. The costs of transacting are simply too high. It is this latter aspect that is of prime interest here.

A substantial part of transaction costs are related to the costs of demarcating a good. The idea to be developed here is that it is much easier - less costly - to apply a policy instrument to traded inputs or outputs - i.e., private goods - than to apply them to the associated public goods or bads. This has not least to do with the costs of demarcation and the associated costs of observation and control. Concerning Figure 2 this implies that the least costly points of instrument application will be the traded input \(x_1\) or the traded output \(y\). If private and public goods are joint the mix of outputs is independent of whether payments are made via the private or the public good directly. On the other hand, such solutions may be too imprecise compared to measures directly attached to the public good one wants to secure or promote. To develop this reasoning a clarification of what is meant by transaction costs and precision is needed.

### 3.2 Precision and transaction costs

Arrow (1969, 48) has defined transaction costs as the “costs of running the economic system”.\(^9\) Dahlman (1979) operationalized this perspective by dividing in costs of information gathering, contract making and control. In most policy analyses, transaction costs (TCs) are not explicitly considered - i.e., they are implicitly assumed to be zero. This is a bit strange, because if TCs are zero, it is impossible

\(^8\) In this paper I use the concept 'public' for denoting that the good is available to all - i.e., nobody is excluded. Whether the good is rival in use or not is not considered.

\(^9\) Cited in Williamson (1985).
to discriminate between different economic structures on the basis of efficiency (Williamson 1985, Eggertsson 1990), and we do not need any public policies except those defining the rights structure (Coase 1960).

Actually, there are two technical reasons for being interested in multifunctionality. First, if goods can be jointly produced, there exists a potential for cost reduction (Hoel and Moene 1993; Schumway et al. 1984). Second, treating goods as bundles will often imply reduced TCs. The famous Tinbergen conclusion that there should be one policy measure for each policy objective (Tinbergen 1950) demands zero TCs. If TCs are positive, we have a trade-off problem between TCs and the precision of the policy (Vatn 1998).

What is then meant by precision? In a policy situation like the one focused here, costs can be divided in two. First, we have the costs of producing a certain public good - e.g., a certain landscape amenity. Second, we have the policy specific transaction costs. These are the costs involved when establishing and running the policy - i.e., information gathering, contracting and controlling. A precise solution is reached when the standard condition for optimality is met in the production of the good - i.e., marginal costs equal marginal gains. Furthermore, loss of precision can be measured as the net gain foregone by a deviation from this standard optimality condition.

The policy specific transaction costs - for the rest of the paper just termed transaction costs - are dependent on the level of precision. They are in a way the 'costs of being precise'. As an example, an optimal state for a landscape may be defined in terms of production costs involved and utility obtained. Achieving such a state may require several policy measures directed towards changing the qualities of the landscape. The efforts involved in searching for necessary information, specifying new incentives, formulating contracts and policing them have to be weighted against the potential gains of this for each element involved. In doing this, one has to make a trade-off between the gain of transforming the landscape as near the 'ideal' as possible with the transaction costs involved. While the marginal utility of increased precision would be expected to fall the nearer one comes the optimal state less transaction costs - i.e., as precision increases - marginal transaction costs would be expected to increase. All costs considered, it would not be reasonable to expect a precise policy to be optimal. For our example this may imply that paying a flat
subsidy per ha to maintain openness may be a better policy than to pay a specific price for each element of the landscape because the gain in reduced TCs is greater than the loss in precision.

4. A global policy regime for multifunctional agriculture

In a situation where private and public goods are interconnected in production and transaction costs are positive, it may not be rational to have free trade for the private goods and pay separately for the public ones. The transaction costs that are invoked by this solution may be higher than the gains in precision obtained by targeting each policy measure. The aim of this chapter is to present the conclusions arrived at when doing a formal analysis of this issue. I will also give a brief overview of the level of transaction costs that may follow from different policy options. A more detailed exposition is given in Vatn (2002a) and Vatn et al. (2002)

4.1 How to secure wanted levels of public goods provisioning

4.1.1 When private and public goods are joint

If private and public goods are joint, producing one of the goods gives the other 'for free'. The public goods that are most likely to have (some of) this property in relation to food production are rural concerns, food security and to some extent food safety. Jointness may be pure - i.e., the one is a direct function of producing the other. Jointness may be impure, implying that the public good is a function both of the private good being produced and some other factor. E.g., food security may not only be a function of national food production, but also that it is based on inputs like own land and not just imported factors of production.

In the situation with pure jointness, the conclusion is straightforward. Paying for national production of the private good will give the accompanying amount of the public good. Paying for this amount of the public good directly will similarly yield a supply of the private good in the same quantity as when paying for it directly. If a country is competitive in the international market for the private good, no special policy is necessary if the public one if it is delivered in the wanted quantities as a
mere byproduct of producing the private.

Problems will especially occur if the country - let us call it country A - is not competitive in the international markets for the private good. Then there is an increased chance of undersupply of the public good since this country will produce small levels of the private good. Given that the quality of the private good is independent of whether it is produced abroad or nationally, this situation can be corrected by paying specifically for the public good. This is exactly what is argued for if one follows the separated strategy as discussed in section 2.3. The point to be made here is that the transaction costs involved if doing this will most probably very high because the public good is difficult to demarcate etc. and thus costly to pay for. The obvious alternative is then to increase the price for the private good - either via import levies or state subsidies. This solution has no more 'distortive' effect on the international market for the private good than paying directly for the public good. The amounts of the private good produced by country A will be exactly the same in both situations. It is, however, reasonable to assume that these costs will be much lower if one pays extra for the private good than paying directly for the public good.

If the jointness is impure, the conclusion is not as straightforward. In this case one will have to make a trade-off between the gain in transaction costs by paying via the private good and the gain in precision by paying directly for the public good instead. As we remember, impure jointness was defined by the fact that the public good was a function of the private good plus some extra input(s). An alternative with the same allocative effects as paying for the public good directly could then be to pay for the private one plus supply the extra input(s) for free.\(^{10}\) If these are traded inputs, transaction costs attached to this solution should be low. Still, in this case the solution cannot be given on pure analytical grounds. It has to be based on the concrete situation and will certainly depend very much on the level of transaction costs in the two cases.

4.1.2 When private and public goods are complementary

Complementarity implies that the production of one good - e.g., the private -

\(^{10}\) There is a set of technical issues related to this proposal that needs to be evaluated in each case. It is beyond the aim of this paper to go into these matters.
delivers an input factor which is necessary in the production of the second - e.g., the public good. Cultural landscape values are typically of this case. If we are still in country A, the conclusions to be drawn are the following:

- If the input(s) at stake is the only input(s) into the production of the public good, the problems and conclusions to be drawn are the same as for the situation with pure jointness. Paying for the complementary private good will give the necessary incentives to deliver the public good in the right volume.

- If there are more inputs involved in producing the public good than those coming out of the process behind the production of the private good, the conclusion is parallel to that of impure jointness. In this situation a case-by-case evaluation is necessary.

Certainly, in the case of complementarity one must be especially aware of the fact that some of the goods involved - like biodiversity - may be positively linked to agricultural production only up till a certain level. Beyond this level the relationship will shift. Increased agricultural production will reduce the value of the public good. This is parallel to the situation where agricultural production reaches an intensity where it pollutes groundwater or surface waters etc.

One way to handle this would be to lower the price of the private good to a level where the public gains obtained - e.g. food security, cultural landscape - at the margin equals the public losses produced - e.g. pollution. If the negative effect - e.g. pollution - is a function of some specific inputs - e.g., mineral fertilizers or pesticides - it can be shown that taxing these inputs will be a more precise solution, though, than reducing the price of the private good. This is the case if substitutes exist for the actual inputs which are not/less damaging to the environment.

4.1.3 Summing up

The above presentation is only highlighting the main findings for each type of public good/ bad. I have also indicated that when setting up the full policy program one has to take all effects into account - both those for the joint gods, the complementary goods and complementary bads. Furthermore, the choices to be made are not only between paying via the private goods or directly for the public one. As indicated, regulating on (easily observable) inputs is an important supplement.
Paying specifically for certain land uses will often be an important part of a full package of instruments.

The degree of competitiveness is an important issue when evaluating what is a rational policy for each country. The same is the country’s ability to raise funding via income taxes etc. Some countries - not least developing ones - may have to rely more on import levies than state subsidies.

From an economics point of view the answer to the funding issue depends not least on the effect of import levies on the competition in downstream industries, the country specific marginal cost of taxation and the character of the public goods involved. If it is the imports that directly create the loss of a public good - e.g., food borne diseases - it is not enough to support own production to secure a certain standard of food safety. One must also look specifically at ones import strategy. In this case import levies can be looked upon as a tax on a negative externality.

4.2 The level of transaction costs

The conclusions in the above analyses depended very much on assumptions concerning the level of transaction costs. While grounded in facts about the characteristics of the various types of goods, empirical evidence is important to substantiate the reasoning.

Over the last few years there are some studies undertaken where the level of transaction costs is measured - i.e., Eklund (1999), Falconer and Whitby (1999), Falconer et al. (2001) and Vatn et al. (2002). These analyses provide a rather uniform picture. To give an overview of the results. I find it reasonable to split in three:

- transaction costs for payments linked to a private good - e.g., product subsidies or input taxes,
- transaction costs for payments linked to an easily observed good which is still not traded - e.g., land or own animals, and
- transaction costs for payments focused directly on the public good - i.e., landscape payments etc.

One should expect transaction costs to increase from the first via the second to
the third type. Following the analysis of Williamson (1985) we may point at several reasons for this. Private goods are per definition easily observable. No extra information is necessary beyond that existing already in the market place. The volume of the good is normally large. If we go to the other extreme - paying directly for the public good - one faces a good that is costly to observe, no or little prior information exists and the amounts are small - i.e., each good is more or less idiosyncratic in the vocabulary of Williamson.

Comparing the transaction costs across policies is difficult. It is first of all hard to estimate these costs; furthermore it is problematic to compare cost across fields with no common denominator. All studies referred to above use transaction costs as a percentage of economic supports/ taxes to establish a ground for comparison. While this is maybe the only reasonable measure available, it will certainly be sensitive to the level of the actual subsidy or tax. Despite this, a rather stable picture appears across studies:

- In cases where the policy measure is attached to a private good that is marketed in large quantities and easily observable - like milk and fertilizers - transaction costs only amounts to some few tenths of a percent of the involved payments (subsidies or taxes).
- If the policy measure is attached to a good/input that is not traded, but is easy to observe and in rather uniform and large quantities - e.g., acreage, animals etc. - transaction costs amount to some few percent of the involved payments.
- If the policy measure is attached directly to the public good or to some ‘proxy’ which is more difficult to observe and/or low in quantity - e.g., special landscape ventures and organic farming - transaction costs amount to some/several tens percent of the payments.

These observations tell us that transaction costs are important when evaluating the efficiency properties of various policies.

5. Globalization, rights and efficiency

From the above we must conclude that a globally established free trade regime in agricultural commodities will not lead to a rational policy concerning the delivery of
the full range of goods involved - neither private and public. This raises the issue of which rights different countries should be granted concerning national policies to protect the delivery of public goods. While the proponents of the 'separated strategy' have argued that keeping things apart implies that trade may go on 'undisturbed', we have observed this cannot be the case. The characteristics of multifunctional agriculture are such that 'separation' does not work. This is not only because of the transaction costs involved, but also because paying for the public good will influence the supply of the attached private product.

Basic to any efficiency calculus is the prior definition of rights. These define which interests are to be protected. It is only on the basis of a rights structure we can establish which resource allocations become efficient. In welfare theory the focus is on the efficiency issue. Rights (or endowments) are taken as given. The distribution of rights is a normative issue outside the scope of economics. However, in most institutional reforms like defining environmental policies or setting rules for international trade, the concern is foremost about defining or redefining rights (Bromley 1989). Still, the issues are very often cast in efficiency terms. This is bewildering.

Let us start with a simple example - the problem of defining what is a positive or negative externality. Trying to clarify this on pure physical grounds has failed (Coase 1960, Vatn and Bromley 1997). Whether A is presumed to restrict neighbor B's possibilities when A lets his trees grow or B restricts A's possibilities when demanding them to be felled is a question of defining what is the right and for whom. Whether the trees or the access to sunshine is to be protected cannot be defined on the basis of physical characteristics. It is only through defining rights to resources that it becomes clear what is a harm or a sacrifice (Bromley 1991).

Given zero transaction costs, rights do not influence resource allocation (Coase 1960).\textsuperscript{11}) If B wants sun more than A wants trees - i.e., if B is willing to pay more for sun than A for the trees - they will be cut independently of who has the initial right. The only difference relates to which of the two has to compensate the other. In a situation with positive transaction costs - i.e., in any real world

\textsuperscript{11}) To be precise also a population with homogeneous and homothetic preferences have to be assumed for this conclusion to hold, otherwise the income distribution inherent in any rights distribution will influence resource allocations.
circumstances - the distribution of rights influences resource allocations directly. Since trading, setting up agreements, etc. is costly; the distribution of rights is crucial in defining which resource use becomes efficient (Randall 1974; Bromley 1991). Scheele (2001) discusses this issue explicitly for agriculture and the environment, showing the need for defining a baseline politically. First from the (necessarily normative) definition of that baseline, it becomes possible to evaluate whether an activity implies a positive or negative change - for example whether the Provider Gets or Polluter Pays Principle should be used.12)

Similarly, the issue about who has the burden of proof in cases with uncertain consequences is also a fundamental rights issue. Is it the producer that has to document that no negative externalities arise from the production, or is it the potential victim that must carry that burden. The way responsibility is defined may have immense effects on the type of production to develop and the allocation of resources - especially in a complex world with high transaction costs (Vatn 2002a).

The innate problem, especially to international trade, is the process of defining rights between countries or agents in different countries. In international trade there is no common authority structure like a parliament defining a common social welfare function, specifying when something is a harm to somebody, etc. This issue has to be determined on the basis of a bargain between states.

First one should recognize that these independent powers are not equal in reality. This is important, especially concerning developing countries which tend to be the losers in such processes. Beyond this, a right must be based on an authority structure that is common to all states - i.e., some sort of a 'super state'. Since there is no such common norm, we observe that efficiency arguments 'intrude' the arena as a legitimate, even determinate argument concerning which rights should exist. However, this is doomed to end in circularity and confusion. We observe this in the debate about 'trade distortions'.

When a trade regime is set up, giving country A the right to export its products freely to country B and vice versa is based on the argument that both countries will gain from trade. When for example country A realizes that the external effects of that trade are such that effects for A turn out to be negative, it may want to

12) Scheele (op.cit) uses 'good agronomic practice' as the reference point. This concept illustrates that it may be hard to define such a point. It can still not be exempted form.
change the regime. Should that issue be determined on the basis of who gains the most from either institutional structure or should each country be given a right to define some standards to protect itself? Certainly this is a very difficult issue when no common authority structure or social welfare function exists. It is, however, logically wrong to determine the outcome on the basis of who is willing (or able) to pay the most for a specific rights structure and then call it efficient. This reasoning is and will always be circular.

6. Conclusion

This paper has emphasized a set of issues of great importance to the study of the process of globalization and multifunctional agriculture:
- First, we have recognized that free trade may endanger public goods, of which values attached to agricultural production are important subgroups. A global free trade regime is not a rational response to the issues involved, including variations in ecosystems and cultures.
- Second, a separated approach – an approach where trade policies and environmental policies/policies for public goods provisioning is kept strictly apart – seems not to be an adequate response either. It presupposes independency between the two categories of goods. Such an independency does not exist. It furthermore assumes transaction costs to be of no or little importance. This is not a very sound assumption either.
- Third, whatever instruments used, one has to recognize that what becomes efficient is in the end dependent on which rights are granted to the involved countries.

Given these insights, I have concluded that we need a type of integrated approach where the interdependencies across products and processes are taken care of and transaction costs are given a proper treatment. Doing so, we have reached the conclusion that one global market will not be a rational response to the challenges faced. Prices for agricultural commodities will have to vary to be able to produce a reasonable delivery of the attached public goods. The degree of protection has to be anchored in an international agreement concerning the rights of each
country. The form of protection will depend on various technical issues like the 
character of the goods involved and the potential for raising various types of 
funding.

Properly conducted, economic analysis thus gives less support to the creation of a 
single market for food commodities than often believed. However, the paper also 
presents a more stringent tool to evaluate the legitimacy of existing national 
policies. Certainly, it is a tool for critical analysis also in that respect. Further work 
is, however, needed to make the ideas more operational.

Many important issues could not be covered in this paper. One topic is to study 
the combined effects of sets of policy measures more systematically. I have only 
touched the surface of this issue. In a complex system of private and public 
goods/bads like agriculture, many synergies and 'antergies' are involved and should 
be an integrated part of a full assessment. This has, however, to be done on the 
basis of more substantiated knowledge about local institutional, ecological and 
cultural information.

One must also acknowledge that other sectors than agriculture can deliver (some 
of) the goods included as part of a multifunctional agriculture. Possibilities and 
problems related to this issue demand their own thorough study. Many solutions 
have been proposed. Still, one should also remember that joint production is a way 
to keep total costs down. One must have this in mind when comparing agriculture 
with other sectors - i.e., one cannot just compare the supply of single goods one at a 
time. One must look at the whole set of goods together. This is in itself an important 
insight from applying a systems perspective when studying multifunctionality.

〈References〉

trade: the cases of coal and food. In Anderson, K. and Blackhurst R. (eds.), The 
Greening of World Trade Issues. Ann Arbor: The University of Michigan Press, 
145-172.

Ann Arbor: The University of Michigan Press, 3-22.


Rural Development Administration
Oxford: Claredon Press.


농업의 다원적기능, 그리고 세계화와의 그 양립성

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〈국문초록〉
전세계에서 농업은 매우 다양한 조건 속에서 영위되고 있다. 이는 농업 활동에서 가장 중요한 요인인 자연환경이 크게 다르기 때문이다. 농업은 다양한 생태계 환경과 동화되고 있다. 그러나 이러한 농업의 형태는 그 사회의 경제발전 정도와 사회 정치적 임대를 반영한다. 그에 따라 농업이 지닌 다원적 기능의 내용은 지역과 나라에 따라 차이가 있게 마련이다. 세계화의 부각과 함께 이제 국제화의들은 지마다 농업 다양성에 대한 문제를 논의에 몰려고 있다. 농업의 수많은 기능들은 공약에 기여하고 있다. GATT/WTO의 농업협약 제20조는 이러한 ‘농업의 다기능성’을 비교적적 관심, 즉 식량안보와 환경보호의 차원에서 다루고 있다. 이제 이 개념은 최근 OECD에서 확고한 위치를 획득하였다. 세계화란 용어는 심으로 다양한 의미를 지니고 있다. 이 논문은 이들 경제성장을 극대화하기 위해 상품의 세계시장을 확대해 나가는 경향을 지칭하는 말로 사용하였다. 그러나 공공복지를 위해 공공재를 향상하는 일과 사회적극을 추구하기 위한 자유무역 사이에는 잠재적인 적대관계가 존재한다. 이 글은 바로 이 적대관계에 관한 몇몇 정점을 조명하고 및 가지 전략을 제시하려는 시도이다. 또한 이 논문은 세계화/자유무역과 환경가치의 보호 사이의 관계를 같이 가지고 분석하였다.

이 글은 세계화와 다원적 기능을 둘러싼 문제들에 대해 다음과 같이 논하였다. 첫째, 자유무역은 공공재를 위험할 수 있다. 전세계적인 자유무역 체제는 농업 문제와 생태계 및 문화의 다양성을 관할한 합리적인 형식이 아니다. 둘째, 무역정책과 경제정책/공공재 공급정책이 엄격하게 분리되어야 한다는 분리 전략도 적절한 대책이 아니다. 이는 시장차와 공공재 사이의 독립성을 전제로 하는 것이지만, 이 역시 올바른 가이드가 아니기 때문이다. 셋째, 어떠한 수단이 적용되더라도, 무엇이 효율적인가를 판단하는 것은 결국 어떤 권리가 관련 국가들에 주어지는지에 달려있다. 이러한 통찰을 통해 필자는 생산과 과정의 상호의존성이 고려되고 거래이익이 합당한 대우를 받는 통합적인 접근이 필요하다고 판단하였다.

그에 따라, 필자는 전세계적인 단일시장은 결코 우리가 담당한 문제에 대한 합리적인 대응책이 아니라라는 결론에 도달했다. 농업과 관련한 공공재를 종합히 생산하기 위해서는 농산물 가격에 차이가 존재해야 한다. 농업보호의 수준은 각국의 권리로 충분히 고려한 국제 협약에서 확정되어야 하며, 농업보호의 형태는 관련 재화의 특성과 다양한 형태의 기금조성 가능성과 같은 기술적 문제에 따라 달라질 것이다. 이 글에서 중요한 다루지 못한 중요한 문제 가운데 하나는 정책 수단들의 결합효과를보다 체계적으로 연구하는 일이다. 농업과 같은 사유재와 공공재/공해의 복잡한 체계에서는 수많은 작용/반작용이 발생하므로 이를 총 과제의 일부로 통합하는 일이 필요하다. 그러나 이를 위해서는 지역의 제도적, 생태적, 문화적 정보에 대한 보다 구체적인 지식을 토대로 행할 때에만 비로소 가능한 일이다.

핵심주제어: 농업의 다기능성, 세계화, 전세계적인 자유무역 체제, 거래이익