

**ENVIRONMENTAL EFFECTS OF AGRICULTURAL  
TRADE LIBERALIZATION AND DOMESTIC  
AGRICULTURAL POLICY REFORMS**

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# ENVIRONMENTAL EFFECTS OF AGRICULTURAL TRADE LIBERALIZATION AND DOMESTIC AGRICULTURAL POLICY REFORMS

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*The paper reviews existing studies on linkages between agricultural policies, trade liberalization and the environment. Since the price and production changes induced by the Uruguay Round Agreement on Agriculture seem likely to be quite modest for most countries, this partial trade liberalization may not cause major changes, positive or negative, in the environmental impacts of agricultural production. Instead, the environmental impacts of domestic agricultural policy reforms will probably be more significant than impacts induced by the Uruguay Round Agreement on Agriculture. This is largely due to the fact that agricultural trade liberalization, partial or complete, can alleviate some policy failures which have adverse environmental impacts, but does not correct environmental market failures. By contrast, domestic agricultural policy reforms, while alleviating policy failures, could also tackle environmental market failures through, for example, agro-environmental programmes.*

## INTRODUCTION

### *A. Background*

Governments have intervened in the production, trade and consumption of agricultural products in almost all countries. There is a general tendency to protect and subsidize farmers in developed countries and to tax and discriminate against farmers in developing countries.

The main objectives of agricultural policies in many developed countries have usually been food security and the income level of farmers. The objective of self-sufficiency in food has been exceeded in many countries and consequently overproduction of agricultural products has become a problem in those countries whose production is not cost-competitive. Thus, domestic surpluses have been exported to world markets by using export subsidies, which has depressed world market prices. Overproduction has been tried to be solved through production control measures like production quotas, which have created market distortions and economic efficiency losses. Market price support has been used extensively to support farm incomes. However, market price support has contributed to the intensification and specialization of agriculture, which are the main causes of direct pollution due to agricultural production.

In developing countries agriculture is taxed, directly or indirectly, to generate revenue for industrial expansion, and agricultural prices have been held below world market prices in order to secure low retail prices for urban consumers. Low and taxed producer prices and ill-defined property rights have prevented farmers from adopting environmentally benign production techniques and resource conservation practices. In addition, fertilizer and pesticide subsidies are sometimes paid to offset the disincentive effects of low producer prices. However, the low application efficiency of subsidized inputs has resulted in environmental pollution.

Hence, both protection and discrimination of agriculture distort the intersectoral allocation of resources and consequently impose "deadweight" losses on society. The causal chain from agricultural protection and discrimination to environmental degradation is straightforward, since environmental degradation is partly due to distortions in resource allocation.

The objectives of agricultural policies are not a problem *per se* but the agricultural policy instruments used to achieve these objectives may be. If agricultural support were provided through lump sum transfers, the economic costs relating to support would be minimized. Hence, a re-instrumentation of domestic agricultural policies is needed to alleviate both economic and environmental costs relating to current agricultural policies. The increased demand for domestic agricultural policy reforms has evolved both domestically and internationally.

The linkages between agriculture, trade and the environment have emerged in the context of multilateral trade liberalization in agriculture. The environmental impacts of agricultural policy and trade reforms are complex and not well understood. This is partly due to the fact that there is only limited empirical research examining the environmental impacts of specific agricultural policy instruments. In addition, while a large number of theoretical studies dealing with agricultural trade liberalization have been undertaken, only modest attention has been paid to the likely environmental impacts. Furthermore, since the commitments in the Uruguay Round Agreement on Agriculture as well as those taken in the context of domestic agricultural policy reforms overlap, it may be difficult to distinguish whether environmental impacts are brought by trade liberalization or domestic policy reforms. This has to do with the fact that increased trade flows owing to agricultural trade liberalization have mainly indirect effects on the environment through complex changes in the location, intensity, product-mix and technology of agricultural production, factors that are also affected by domestic agricultural policies. Thus, the environmental effects of agricultural trade liberalization are channelled through domestic agricultural policies and their impact on production patterns and via these on the environment. Hence, the integration of environmental considerations into domestic agricultural policies may play an important role when realizing full environmental and economic benefits from agricultural trade liberalization.

However, current agricultural policies and production patterns and their environmental impacts form the baseline against which changes in environmental quality due to trade liberalization and

domestic policy reforms can be assessed. Since the Uruguay Round Agreement on Agriculture as well as domestic policy reforms are quite recent, and many environmental impacts become evident only in the longer term, qualitative elements play a major role in this analysis.

## ***B. Objective of the paper***

The objective of this paper is to synthesize existing studies on linkages between agricultural policies, trade liberalization and the environment. It will not directly provide new empirical evidence. However, the hypotheses provided by earlier studies will be compared to the latest information on, for example, world market prices, production changes, market access, etc. Issues to be addressed include: (i) the environmental implications of domestic agricultural policy instruments; (ii) the environmental effects of overall changes in agricultural policies, i.e. domestic agricultural policy reforms; (iii) the environmental effects of agricultural trade liberalization in developed and developing countries.

## ***C. Structure of the paper***

The paper is structured as follows. First, in order to provide a basis for a qualitative analysis of the likely environmental impacts of agricultural policy and trade reforms, the environmental effects of current agricultural policies are examined in chapter I. This is followed in chapter II by a description of the main elements of domestic agricultural policy reforms and the analysis of the likely environmental impacts of these reforms. The main elements and some viewpoints on the implementation of the Uruguay Round Agreement on Agriculture, as well as the likely environmental impacts of agricultural trade liberalization are then examined in chapter III, which is the main part of the paper. Finally, conclusions and policy implications are provided in chapter IV.

# **I. ENVIRONMENTAL EFFECTS OF CURRENT AGRICULTURAL POLICIES**

Environmental effects of different agricultural policy instruments are not always apparent, which makes their assessment complex. Moreover, there is only limited empirical and quantitative research that examines the relationships between the level of support, the specific policy instruments implemented, intensity of input use and environmental impacts (OECD, 1994d). However, agricultural production subsidies have an impact on environment via altering incentives for farmers. By creating economic and market distortions, these subsidies may produce adverse environmental impacts. Short-run effects of agricultural support policies on the environment are often connected to their influence on levels of

variable input use like fertilizer and pesticide use. Market price support and deficiency payments as well as other policies that increase unit revenues to producers stimulate production, and hence the use of variable inputs, creating more pressure on the environment than would otherwise have arisen (OECD, 1994d; OECD, 1995c).

### *A. Major domestic agricultural policy instruments*

Following the OECD (1994b), the four major agricultural policy instruments used to support cereal and dairy producers in OECD countries are market price support, deficiency payments, production quotas, and direct income support.

In the **market price support** system the domestic market price is fixed at a level higher than the equivalent world market price. For a traded commodity, market price support requires the use of border measures to provide import protection, and if domestic surpluses are generated, the use of export subsidies. Market price support raises domestic producer and consumer prices, thus increasing production and decreasing consumption, implying a transfer from consumers to producers. Hence, the market price support system distorts both production and consumption decisions.

**Deficiency payments** guarantee producers a per unit payment on output equal to the difference between the market price and an administrative target price. This policy instrument raises the effective producer price through direct payments by taxpayers rather than transfers from consumers, as consumers pay the lower market price.

Under the **production quota** system the government sets a support price and restricts production to a level below that which would otherwise occur at the support price. Production quotas are usually used in combination with support price or deficiency payments. According to OECD (1996a), the main quantitative restrictions in OECD countries include quotas on output (e.g. the EU quotas for milk and sugar) and set-aside of agricultural land, and it is increasingly the case that farmers receiving market price support or direct payments must comply with specific input or output constraints. Quantitative restrictions lead to economic efficiency losses, can create significant market distortions for the commodity controlled and have negative "spillover" effects on competing products or on factors of production. In addition, the long term supply controls may reduce the competitiveness of controlled sector by slowing structural change and technological innovation.

The term **direct income payment/support** refers to transfers that are financed by budgets and paid directly to farmers, and are independent of current and future production levels, whereas the term **direct payments** refers to budgetary measures with no judgement as to their linkage with production or factors of production. The latter category includes a wide range of different types of payments, such as deficiency payments, area and headage payments. These payments may be based on past farm or

regional production data, and can generate economic distortions to varying degrees (OECD, 1994a; OECD, 1994b).

## ***B. The measurement of agricultural support***

The *Producer Subsidy Equivalent* (PSE) is the level of subsidy that would be necessary to compensate producers, in terms of income, for the removal of government programmes affecting a particular commodity. PSE calculations include all the transfers that specifically result from agricultural policies. Thus, the PSE can include the transfer effects of any policy that can be linked directly to farm incomes, including trade restrictions, market price supports, direct transfers, input- and factor-market policies (OECD, 1995a; Tangermann, *et al.*, 1987).

The percentage PSE for the OECD as a whole has fluctuated around 40 per cent since 1988 (table 1). There is, however, a wide range of percentage PSEs among the OECD member countries. The lowest estimates have usually been for Australia and New Zealand and the highest have been for Japan and former EFTA countries. It is important to note that PSEs for developing countries between the years 1979-1989 were usually low or negative, for example, -38 per cent for Argentina, -4 per cent for Thailand and -2 per cent for India (Anderson, 1991).

***Table 1***

***Trends in producer subsidy equivalents in selected OECD countries***

<i>Percentage producer subsidy equivalents</i>					
<i>1979-81</i>	<i>1986-88</i>	<i>1989-91</i>	<i>1992</i>	<i>1993<sup>e</sup></i>	<i>1994<sup>p</sup></i>

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