Resource Policy Subsidies and the GATT Negotiations

John D. Sutton

Abstract

Domestic resource policies, such as below-market price irrigation water and conservation acreage retirement, may be important to the GATT (General Agreement on Tariffs and Trade) negotiations when they are, in effect, subsidies that can affect production and trade. This report looks at both explicit and implicit producer subsidies in overall terms and with respect to specific policies of major trading countries. Two guidelines are presented that might be used to determine whether resource policies distort trade.

Keywords: Resource policy, GATT negotiations, conservation, European Community, developing countries, soil erosion

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Conversion

1 hectare = 2.5 acres
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Summary

Domestic resource policies, such as below-market price irrigation water and conservation acreage retirement, may be important to the GATT (General Agreement on Tariffs and Trade) negotiations when they are, in effect, subsidies that can affect production and trade. This report looks at both explicit and implicit producer subsidies in overall terms and with respect to specific policies of major trading countries. Two guidelines are presented that may be used to determine whether resource policies distort trade.

Resource policies, which include explicit or implicit producer subsidies, may affect production and trade by promoting or restricting resource use. Reform may eliminate, immediately or by degree, support and protection to agriculture that directly or indirectly distort trade.

- Explicit resource subsidies include below-market price irrigation water and grazing rights, overvalued currency exchange rates for fertilizer imports, and tax credits for converting forests to productive cropland.

- Implicit resource subsidies include producers' use of environmental resources that are highly valued by society, such as uncontaminated groundwater supplies, without charge.

Measuring explicit resource subsidies across countries is straightforward, but measuring implicit resource subsidies is difficult because countries do not have comparable values for environmental resources and because markets to price some environmental resources do not exist.

Using the U.S. Conservation Reserve Program as a case study, the report presents two guidelines to evaluate resource policy subsidies. First, policies that have a primary objective of environmental protection could be exempted, with later study focusing on how to reduce trade-distorting effects of specific mechanisms within those policies. A taxonomy of policy tools describing potential effects of each tool on environmental protection, commodity production, and trade would make this process easier.

Second, it could be recognized that countries assign different values to environmental resources and assumed that one country's environmental protection policy is another country's producer subsidy. Under this guideline, producer soil conservation payments, which have major commodity production effects, are viewed as affecting but not distorting trade. Policies that affect but do not distort trade would not necessarily be subject to reform.
Resource Policy
Subsidies and the
GATT Negotiations

John D. Sutton*

Introduction
At the July 1987 meetings of the General Agreement on Tariffs and Trade (GATT), the U.S. delegation proposed that all countries liberalize agricultural commodity trade by eliminating, over a 10-year period, support and protection to agriculture that directly or indirectly distort trade (23).1/ Fully carrying out this proposal would mean eliminating trade-distorting agricultural policies that provide producer income subsidies. The European Community (EC) and other parties to the GATT have submitted alternative plans in response to the U.S. proposal.

GATT countries are now engaged in negotiating which set of policies and policy provisions they will eliminate or reform. A key to the negotiations is developing a measure of producer subsidies that is acceptable to all. The producer subsidy equivalent (PSE), developed by staff at the Organization for Economic Cooperation and Development and the Economic Research Service of the U.S. Department of Agriculture (USDA), is such a measure (19).2/

Producer subsidies found in agricultural resource policies are of two kinds, explicit and implicit. An example of an explicit subsidy is irrigation water rates set at below-market prices. The PSE is well suited to measure explicit subsidies.

The second kind of subsidy, the implicit subsidy, poses significant measurement problems. It occurs when society's value for an environmental resource such as unpolluted groundwater is higher than its market price, which may be nearly zero. When

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* The author is an agricultural economist with the Resources and Technology Division, Economic Research Service, U.S. Department of Agriculture.

1/ Underscored numbers in parentheses refer to items cited in the References section.

2/ Other measures include the nominal rates of protection and effective rates of protection.
producers do not have to pay to use that resource, they receive an implicit subsidy that is the difference between the societal and private values. Measuring implicit resource subsidies within one country is difficult because of the failure of free markets to price the resource. Developing subsidy estimates that are acceptable to all GATT countries is a greater problem because societies differ in the values they ascribe to environmental conservation.

This report focuses on the nature of explicit and implicit subsidies found in agricultural resource policies. It does this by looking at both types of subsidies in conceptual terms and in the specific policies of major trading countries. Analysis of the U.S. Conservation Reserve Program (CRP) helps to suggest two guidelines for GATT negotiators who must consider subsidy aspects of agricultural resource policies.

An Overview of the GATT and Resource Policies

Members of the GATT opened a new round of multilateral trade negotiations at Punta del Este, Uruguay, in September 1986. The 95 GATT countries together account for over four-fifths of world trade (19). Agricultural trade was a major item on the agenda in contrast to all earlier GATT rounds, which ignored agriculture and focused on trade in industrial products. GATT members generally have been reluctant to submit domestic agricultural policies to international scrutiny, and GATT rules on agriculture are far more lenient than those on industrial products. As a result, industrial countries committed to supporting domestic farm incomes have instituted protective trade arrangements that often distort the location, amount, and stability of world trade.

The main reasons for putting agriculture on the agenda stem from the huge expansion of world production capacity in the 1970's and the global weakening of commodity demand in the 1980's. As the trade volume leveled off, commodity stocks grew, world commodity prices fell, and farm asset values (especially land values) declined. Deteriorating conditions in the 1980's led the United States to support farm income with income deficiency payments, reduce production (and hopefully inventories) with acreage set-aside programs, and increase exports with subsidies designed to directly counter EC export subsidies.3/ Farm policy costs in the United States and the EC grew dramatically.

3/ A deficiency payment is a Government payment made to farmers who participate in feed grain, wheat, rice, or cotton programs; payment rate is per bushel, pound, or hundredweight, based on the difference between a target price and the market price or the loan rate, whichever difference is less. A set-aside is a program to limit production by restricting the use of land. It restricts the amount of a farmer's total cropland base used for production rather than the acreage used to produce a specific crop.
GATT parties have proposed a variety of policy reforms consistent with the 1986 accord to achieve a more liberalized trade environment. The United States proposed multilateral reduction of import barriers and of all direct and indirect subsidies and other measures directly or indirectly affecting agricultural trade. The U.S. proposal reflects a desire to reduce budget costs as well as its faith in the efficiency of free markets.

The EC then called for short-term measures to stabilize commodity markets and reduce farm support costs and to discuss long-term measures at a later date. The EC proposal shares the U.S. desire to reduce costs but leans more toward supply management and market sharing.

The CAIRNS group of 13 agricultural exporting countries led by Argentina, Australia, Brazil, and Canada offered yet another proposal that combined aspects of the U.S. and EC proposals with other measures.

GATT parties also disagree on the causes of agricultural trade problems. Japan, a major importer, feels that trade problems are due to exporter subsidies rather than to restrictive import measures.

Some resource policies--such as those in the United States that subsidized irrigation water, grazing, and soil conservation to boost farm productivity--contributed directly to increasing production capacity. These resource subsidies explicitly improved producer incomes and farm productivity.

Policies in other countries similarly provided explicit subsidies to convert forests and wetlands to cropland and to increase use of fertilizers and agricultural chemicals. Although commodity demand weakened in the 1980's, the policies that promoted resource use through explicit subsidies remained in force.

The United States and other high-income countries also enacted resource conservation policies to reduce the environmental degradation caused by intensified cropland use. Expanded commodity demand in the 1970's brought more acreage into production, greater application of fertilizers and agricultural chemicals per acre, an upsurge in irrigation, sharply higher farmland values, and more concern over environmental degradation.

Conservation policies recognize that producers overuse environmental resources, such as unpolluted water supplies, for which there is no market price; in effect, these producers receive an implicit resource subsidy from society. The size of the subsidy is the difference between the market price of a resource, say, water free of toxic pollutants, and society's value for it.

Conservation policies protect natural resources against degradation. They raise or lower resource subsidies in several ways. Restricting use of highly erodible soils for crop production, for example, tends to raise producer costs and reduce
the implicit subsidy. Federal cost sharing for installing soil
conservation devices such as terraces on private lands may
increase farm income through productivity gains. Federal
payments to producers to retire erodible land and reduce soil
loss may simply replace an implicit subsidy with an explicit
payment. The conservation provisions of the U.S. Food Security
Act of 1985 and the EC's "extensification" program to protect
fragile lands are recent examples of conservation policies that
contain such measures. The extensification program pays farmers
to restrict use of farmland for environmental purposes.

Resource conservation policies designed to change resource use
can also affect commodity production. The CRP is an example of
such a policy. This U.S. policy uses producer payments to
achieve its environmental objective of reducing soil loss, but
also reduces crop base acreage (the specific amount of land a
farmer may plant to a specific program crop) and, therefore, crop
production. Nonresource policies designed to shrink supply, such
as commodity program set-asides, are among policies GATT
negotiators are scrutinizing as trade distorting. Thus, GATT
parties may pay special attention to conservation programs like
the CRP that pay farmers to retire land.

How Resource Policies Affect Trade

Whether agricultural resource subsidies are implicit or explicit,
their removal can increase private costs of production.
Implemented unilaterally, a resource conservation policy that
raises private production costs can reduce a country's production
and supply to export markets.

Figure 1 illustrates near-term effects on trade of a new resource
conservation policy that reduces implicit producer subsidies.
A comparative statics approach for a large country 4/ exporter
(13) is used.5/ In the equilibrium situation that exists before
policy is introduced, the exporting country produces OX₂. The
costs that constitute the commodity supply curve, S, do not
include any charges to or restrictions on producers for their use
of a socially valuable environmental good such as unpolluted
groundwater. That is, producers are receiving an implicit income
subsidy from society whenever they use up the clean water supply.

Domestic commodity demands are OX₁ at domestic price P (equal to
the world price WP₂). The country markets its excess supply,
OX₂ - OX₁ equal to OW, on the world market (fig. 1(c)). This
supply, in turn, is purchased by the importing country, OW₁ - OW₂
(fig.1 (d)).

4/ A small country exporter, by definition, does not influence
world commodity prices. Brazil is a large country in the world
soybean market and a small country in the world corn market.

5/ Supply and demand curves shown are solely for demonstration.
The magnitude of results is sensitive to the implied elasticities. Figure 1 is adapted from (13).
Suppose a Government introduces a new resource conservation policy to reduce soil loss. Such a policy could include restrictions on land use in environmentally sensitive but highly productive cropland areas. The reduced availability of land leads to a rise in its price and the land supply curve shifts up and left to $S'_l$ (fig. 1 (a)). As fixed costs per unit of production rise, the exporting country's commodity supply would shift up and left to $S'$.

World and domestic prices would initially rise to $P_1$. The price increase reduces the exporter's domestic demand to $OX_3$ and reduces its excess supply to world

6/ This is an example of lowering an implicit resource subsidy. But, it has similar results to removing an explicit subsidy, say, grazing fees on a public range set at rates below those on a comparable private range. Removing such a subsidy would raise the cost of grazing on public lands and, therefore, raise total production costs. The supply curve of the exporting country would shift up and to the left.

Figure 1
Near-term effects of land conservation policy on trade
markets to \( OX_4 - OX_3 = OW_2 \) (fig. 1 (b)). The higher world price induces additional production in the importing country and reduces its demand. World trade declines.

Table 1 summarizes the directional changes of figure 1. In terms of magnitude, effects of unilateral policy changes on the exporting country normally would be larger than they would be on the world market or on individual importing countries.

If the country is a small country exporter, the likely direction of domestic effects would be the same as for the large country case except domestic price would remain unchanged. Subsidy removal would also have no effect on the world market. But subsidy removals for small countries, taken as a group, could have a large country effect on world markets.

Although trade analysis typically uses a near-term timeframe, a long-term perspective may alter one's conclusions about how changing resource subsidies and resource use affect trade. Using the soil conservation policy of figure 1 as an example, two long-term results could occur. First, the policy that in the near term reduces production, exports, and soil erosion in the exporting country but increases production and soil erosion in the importing country may raise soil fertility in the exporting country relative to that of the importing country in the long term. The exporting country's production and exports might therefore rise, not fall, in the long term. Or, the opposite long-term production effect could occur. If the policy reduces

\[
7/ \text{ This near-term example assumes that factor proportions in production would not change in the near term. Over the long term, however, producers would tend to save on their use of the scarcer, hence relatively more expensive, land and to increase use of the relatively less expensive nonland inputs. }
\]

Table 1--Directional effects of implementing resource conservation

<table>
<thead>
<tr>
<th>Item</th>
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<th>Item</th>
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<tbody>
<tr>
<td>Exporter 1/</td>
<td>Direction</td>
<td>World market</td>
<td>Direction</td>
<td>Importer</td>
<td>Direction</td>
</tr>
<tr>
<td>Production</td>
<td>-</td>
<td>Trade</td>
<td>-</td>
<td>Production</td>
<td>+</td>
</tr>
<tr>
<td>Market price</td>
<td>+</td>
<td>Market price</td>
<td>+</td>
<td>Market price</td>
<td>+</td>
</tr>
<tr>
<td>Producer surplus</td>
<td>-</td>
<td></td>
<td></td>
<td>Consumer surplus</td>
<td>-</td>
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<tr>
<td>Exports</td>
<td>-</td>
<td></td>
<td></td>
<td>Imports</td>
<td>-</td>
</tr>
<tr>
<td>Erosion</td>
<td>- 2/</td>
<td>Erosion</td>
<td>+</td>
<td></td>
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</tr>
</tbody>
</table>

1/ Exports, trade, and imports are all expressed in terms of volume.

2/ Erosion could possibly increase if the land remaining in production were farmed more intensively.
land available for agriculture in the exporting country, producers may use the remaining land more intensively, an action that could increase soil erosion and lower relative soil fertility in the long term. Policymakers and analysts need to be aware of both long-term possibilities.

Subsidies in Resource Policies

Agricultural resource policies either conserve or promote use of natural resources (land, water, and organic fertilizers) and manufactured resources (inorganic fertilizers and pesticides) as inputs to commodity production. Both kinds of policies may use a variety of explicit and implicit subsidies to achieve their objectives. The conceptual nature of resource subsidies is developed, using examples from major agricultural exporting countries.

Subsidies that Conserve Resources

Policies that restrict resource use may be society's response to the failure of markets to price resources at their full societal values. Market failures allow producers to use environmental resources, such as clean water, the soil's stock of natural fertility for future generations, or wetland habitat as farming inputs, without paying for them. Equilibrium resource use, from the producer's viewpoint, occurs when the price (cost) of the last resource unit is equal to the value of the additional output gained. If, due to market failure, the resource's cost to the producer is less than societal cost of using it, producers will tend to use more than society would otherwise prefer.

8/ The factor-price equation is the conceptual base for describing equilibrium adjustments in inputs and output to market changes. Mathematically, it is expressed as:

\[
\frac{VMP_L}{MFC_L} = \frac{VMP_K}{MFC_K} = \frac{VMP_N}{MFC_N} = \frac{MR}{MC} = 1
\]

On the factor inputs side of the equation, VMP, value of the marginal product, is calculated by multiplying commodity price times marginal physical product of the factor input resource used (land, capital, or labor). MFC is marginal factor cost. On the product or output side, MR and MC are marginal revenue and cost, respectively.

9/ Nonresource policies can significantly affect resource use through their effect on commodity price. For example, policies that provide commodity price supports above the market-clearing level would tend to increase production and, hence, encourage greater resource use. Some commodity programs require cropland to be set aside from crop production annually. Policies that undervalue currency exchange rates increase resource demands by subsidizing commodity exports. This report only discusses nonresource policies when they are helpful to understanding resource policies.
When producers use resources above society's equilibrium level of use, the society at large bears the cost of unwanted environmental degradation: eroded soil, contaminated groundwater, or irreversible loss of biological diversity. Producers receive an implicit resource subsidy to the extent they use environmental resources without paying full societal value. An implicit resource subsidy, in turn, produces an implicit income subsidy. Resource policies that restrict resource use as a result of market failure in essence recognize the subsidy. Policies can reduce the subsidy through restrictions that force up production costs.\textsuperscript{10}

The existence and level of implicit resource subsidies differ among countries. High-income countries more often recognize resource market failures and, consequently, the existence of implicit subsidies than do low-income countries. High-income countries more often implement resource conservation policies to maintain or improve environmental quality, a superior good \textsuperscript{11}, than do low-income countries (14). High-income countries that put a high value on conserving resources are aware of the value of the implicit subsidy accruing to producers who use environmental resources at less than societal cost.

By contrast, low-income countries often put a relatively high value on economic development in the near term and a relatively low value on spending scarce funds now to protect the environment for future generations (8). From their viewpoint, markets do price resources adequately and all users—producers and nonproducers—pay the socially proper price. Therefore, resource users, in the view of most low-income countries, do not receive implicit resource subsidies.

Countries may and do disagree on what constitutes an implicit subsidy. Even if they agree on a definition of an implicit subsidy, they may not agree on its magnitude. The problem this disagreement creates in the GATT negotiations is developed later in the "New Approach" section.

The United States, the EC, and Canada offer examples of resource conservation policies that attempt to lower implicit resource subsidies. The conservation provisions in Title XII of the Food Security Act of 1985 reflect the relatively high value the United States places on maintaining soil fertility for future generations and keeping water sources free of cropland pollutants.

\textsuperscript{10} This analysis is essentially a shortrun view for a perfectly competitive industry. Over the long run, added costs due to regulations or penalties are passed on to consumers. Restricting resource use can result in shortrun producer losses until a new equilibrium condition is met. That new equilibrium reflects the socially acceptable balance between consumption of market-priced goods and nonpriced environmental resources.

\textsuperscript{11} Superior goods are goods whose demand rises as income rises.
Three provisions—conservation compliance, swampbuster, and sodbuster—require producers to conserve highly erodible soils, preserve wetlands, and take fragile prairies out of cultivation or lose all commodity program benefits. These provisions act to reduce the implicit subsidies resulting from private producers' use of socially valuable environmental resources.

Under the conservation compliance provision, producers must actively implement an approved conservation plan for highly erodible land by January 1, 1990, and be in full compliance with that plan by January 1, 1995, or lose commodity program benefits. Commodity program benefits include commodity price supports and income deficiency payments, farm storage facility loans, crop insurance, disaster payments, and Farm Housing Authority loans.

Under the swampbuster provision, farmers who convert wetlands for crop production after December 23, 1985, can lose commodity program benefits on the entire farm, not just on the converted wetlands.

Under the sodbuster provision, commodity program benefits are denied to producers who cultivate highly erodible land converted after December 23, 1985, unless an approved conservation plan is implemented.

A fourth conservation provision of the Food Security Act of 1985, the CRP, combines restrictions on cropland use with direct payments to producers. Under the CRP, the U.S. Secretary of Agriculture can reduce erosion by renting up to 45 million acres annually from commodity producers. The landowners/operators who receive the payments agree to remove the land from production for the 10-year life of their USDA contract. Without these rental payments, producers on highly erodible lands would continue to use up environmental resources, such as the supply of unpolluted surface water, for crop production without paying the societal value for them. Under the CRP, enrollees keep the right to receive this implicit resource subsidy but give up part of that right in return for USDA payments. The program reduces but does not eliminate implicit subsidies since:

- the CRP is voluntary and not all farmers participate;
- the CRP participants enroll only part of their cropland and manage the rest of their farm resources as they choose; and
- the CRP only establishes the participant's opportunity cost for the land and not the full benefit to society of reducing erosion on it.

In Canada, the primary grain-producing Western Provinces and the Federal Prairie Farm Rehabilitation Administration provide cost controls.
sharing to producers for conserving soil and water (1). A main thrust of Canadian conservation policy has been to pay landowners to remove marginal and fragile lands from production permanently. The policy contrasts with the U.S. approach, except in the cases of the U.S. Soil Bank and the CRP. The U.S. approach has been to help farmers improve management of environmentally sensitive lands. Canada usually has eliminated the implicit resource subsidy by permanently removing the lands from production.

The EC's perception of resource market failures and, hence, of implicit resource subsidies appears to be growing. Disagreement among EC countries about the relative importance of environmental degradation has been largely due to a highly diverse European agricultural and natural resource base. The northern EC countries, particularly The Netherlands, Denmark, the Federal Republic of Germany, and the United Kingdom generally are most aware of implicit resource management subsidies. These countries have the most intensive agricultural development (3). Two sets of resource problems, however, are receiving increasingly widespread attention. They are:

- deteriorated terrestrial habitats due to disturbance, pollution, and drainage of wetlands; and
- poorer water quality as a result of eutrophication, nitrate pollution, and pesticide pollution.

Furthermore, agreement that agriculture should be subject to controls designed to avoid environmental deterioration is growing within the EC (3). Adherence to the "polluter pays" principle suggests that future conservation policy will act to reduce resource subsidies whether they be implicit or explicit.

The growing sentiment in the EC toward environmental protection may be inextricably linked to EC administrators' desire to reduce commodity program costs. The Council of Ministers adopted regulation 1760/87 on the "extensification" of agricultural production in June 1987. Although environmental protection and conservation are the stated objectives, the primary purposes of this reform remain controlling supply and containing costs of the EC's Common Agricultural Policy (6).

**Subsidies that Promote Resource Use**

Resource policies explicitly and implicitly subsidize resource use to increase commodity production or raise producer productivity. The U.S. Department of Interior's Bureau of Reclamation, for example, charges irrigation water users less than the price required to cover fully the cost of irrigation project operation and development (10). Nationally, the Bureau provided water service to 10.3 million harvested crop-acres in

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13/ The process by which a body of water becomes either naturally or by pollution rich in dissolved nutrients (as phosphates) and often shallow with a seasonal deficiency in dissolved oxygen.
1986, primarily in California, Washington, and Idaho. It provided full or supplemental water service to 0.9 million acres of corn and to 0.8 million acres of wheat. Cotton and rice are the two most important crops, in terms of national production, to receive Bureau water. Nearly 16 percent of U.S. Upland cotton production and 12 percent of rice production received Bureau water. Total water subsidies in 1986 were greatest for cotton ($26.7 million), corn ($18.1 million), and wheat ($11.9 million). Rice producers, primarily in central California, received $3.2 million.

The USDA's agricultural resource conservation and improvement programs also provide explicit support. In fiscal year 1986, the USDA distributed $1.0 billion in conservation expenditures (18). The activities and programs that accounted for the greatest shares of this total were onfarm technical assistance ($323 million), the Watershed and Flood Protection Program ($265 million), and the Agricultural Conservation Program ($138.9 million).

Soil erosion reduction has a very limited effect on national productivity and farm income in the short run. For example, national soil productivity would decline only an estimated 4 percent over the next 100 years if present levels of cropland erosion continue (2). Public payments for this purpose thus have a small income subsidy component.

The USDA's Forest Service and the U.S. Department of Interior's Bureau of Land Management sell annual grazing rights on their lands in the 16 Western States (except for Texas) at rates far below rates on private lands. Nationally, the quantity of forage that is provided at subsidized rates is small—only 10 percent of all rangeland forage in 1982 (11). The subsidy is more important regionally. Removing the subsidy would tend to affect producers in the arid Southwest the most because they depend most on public lands for forage. Also, sheep producers generally depend more on public grazing rights than do cattle producers.

Canada's promotion of resource use through explicit resource subsidies is much more limited than that of the United States. Canada spent only about $17 million in 1985 to help its farmers adopt production-enhancing practices such as irrigation, improved drainage, and land clearing. Purchased input subsidies were considerably larger, some $317.2 million in 1986. Most of that (92 percent) went for fuel and interest rebates (1).

The EC has left resource promotion policymaking largely to the discretion of individual member countries. If explicit subsidies are implemented, they must be compatible with the CAP for market sharing among EC members (3). Several countries provide explicit resource subsidies in the form of national government funding supplemented with CAP funding to improve field drainage. For
example, in 1983-84, France drained 140,000 hectares and the United Kingdom drained 120,000 hectares (22).

The resource policies of high-income countries can also indirectly promote resource use. If countries recognize that certain resources are valuable, for example, hedgerows in the United Kingdom, yet do not act to impede the private sector's exploitation of them, the countries indirectly promote use of those resources. U.S. policy on nonpoint water pollution also provides an example. On the one hand, our society recognizes the high value of clean water for drinking and recreation. On the other hand, resource policies that effectively reduce fertilizer and chemical runoff from cropland and consequently protect water quality are nearly nonexistent.

U.S. water policy appears to be moving toward eliminating implicit subsidies. The Water Quality Act of 1987, for example, encourages States to develop nonpoint source water pollution management plans. The Environmental Protection Agency (EPA) has proposed national registration of pesticides with county-wide or State-wide restrictions to protect groundwater (20). EPA now currently administers five statutes governing pesticide contamination in groundwater: the Federal Insecticide, Fungicide, and Rodenticide Act; the Safe Drinking Water Act; the Clean Water Act; the Resource Conservation and Recovery Act; and the Comprehensive Environmental Response, Compensation, and Liability Act.

Low-income countries promote greater use of resources to expand commodity production by relying heavily on explicit factor price subsidies. Chemical fertilizer subsidies of 50-70 percent of delivered cost are common (22). Pesticide subsidies are widespread and often radically change relative crop profitability. Many countries explicitly subsidize pesticide use by overvaluing the currency exchange rate for pesticide imports. The majority also promote mechanization through overvalued exchange rates, favored tariff treatment, accelerated depreciation provisions, and preferential allocation of rationed foreign exchange for farm machinery. Almost all low-income countries subsidize agricultural credit for certain income groups and/or priority crops.

14/ The EC does not subsidize fertilizer and chemical inputs, but high commodity price supports under the CAP have promoted heavier input applications. For example, in the United Kingdom, cultivation of rapeseed, a crop that requires double the application of nitrogen fertilizers compared with all other crops and grasses, rose from 6,000 hectares in 1973 to 100,000 hectares in 1981 (22).

15/ An exception to this statement is the National Environmental Protection Act (P.L.-500). This act was a major effort to improve environmental quality, including restrictions on pesticide use to control one type of nonpoint source pollution.
Many low-income countries publicly fund investments in infrastructure to expand irrigation, improve drainage, and control flooding in cropland and pastureland. For example, between 1985 and 2000 an estimated $100 billion will be invested in irrigation, primarily with public funds (1). User fees do not cover operating costs for most projects.16/ 

Resource promotion policies are part of regional economic development programs in many low-income countries. Brazil's Superintendency of the Development of the Amazon (SUDAM), for example, established an investment fund that used explicit tax and investment credits to convert tropical rain forests to pastureland (12). This fund has been a major cause of deforestation in the Amazon.17/ Brazilian policymakers are increasingly recognizing that removing the tree canopy, grazing the cleared land, and continuously cultivating it is causing an irreversible loss of productive capacity. 

A New Approach to Negotiating Resource Policies in the GATT

GATT negotiators are expected to focus on country policies that distort trade by protecting and supporting domestic producers. Resource policies, by definition, affect input use and thereby affect commodity supply and trade. Because resource policies rely on explicit or implicit resource subsidies to producers, GATT negotiators may want to scrutinize policy objectives and performance and determine whether the means to achieving that performance distorts trade. Some broad guidelines for resolving differences and selecting acceptable resource policies under the GATT are presented.

Guideline A

GATT acceptability of an agricultural resource policy could turn on its "true" objective. Negotiators could initially exempt from reform policies designed with the "true" primary objective of environmental protection. Protecting groundwater purity by

16/ Although developing countries have a multitude of producer income subsidies in their resource promotion policies, it is not clear that the net effect of all policies is one of subsidy. These countries often institute conflicting sets of policies that, on balance, promote domestic industry and discriminate against agricultural production and trade. They, for example, fund investments for irrigation and provide direct producer subsidies to promote use of purchased inputs. However, the positive income effects of such policies are then taken away through taxes on commodity exports and macroeconomic policies that leave producer incomes unchanged or lower than before (19).

17/ Agricultural colonists' unregulated slash and burn practices and publicly funded hydroelectric power generation are also major reasons for deforestation.
regulating agricultural use of specific soils would be such a policy. Negotiators could then consider whether modifying particular mechanisms in the policy would reduce secondary trade-distorting effects.

Negotiators could deem resource policies whose primary objective is to increase production by subsidizing resource costs as trade distorting and, hence, subject to GATT reform. Examples of such policies are tax credits to clear rain forests for livestock grazing, overvalued exchange rates for fertilizer and pesticide imports, production loans at below-market interest rates, irrigation water at less than full market price, fees for grazing on public lands below those charged for grazing on private lands of comparable quality, and publicly financed land improvements to boost productivity of a private landholding.

Negotiators similarly could decide that a resource conservation policy with a stated primary objective of reducing erosion but an actual objective of reducing commodity production in times of surpluses is trade distorting. Such a policy could pay farmers to remove acreage annually from production.

Conversely, a resource policy whose primary objective is protecting a nation's natural resource base for the enjoyment of future generations or for continued supply of nonmarket-priced goods might not be considered trade distorting. Negotiators would not reform these policies even though they could have production and trade effects. Examples of such policies include taxes on pesticide use above prescribed levels, restrictions on groundwater use in aquifer drawdown areas, and payments to landowners to remove fragile lands permanently from production.

This "true objective" guideline suggests several issues that warrant the attention of policymakers and researchers: 1) using language in a policy that unambiguously distinguishes between objectives; 2) clearly assigning benefits and costs to each objective; and, 3) determining applicability of the guideline to low-income countries.

Turning to the first issue, it is important that the text describing a policy clearly distinguish between objectives. Resource policies normally have multiple objectives. Ascribing relative importance to each of a policy's several objectives can be difficult. The CRP illustrates the problem. Although the CRP's "primary purpose is reducing erosion," USDA Final Rules and Regulations for the program lists six other "secondary benefits" (5). One is "curbing production of surplus commodities." The importance, but not necessarily the primacy, of reducing erosion in the CRP is supported by the requirement that only highly erodible cropland be eligible for enrollment and that land be retired for 10 years. The amount of soil saved as a result of the 1986-87 signups suggests that the CRP is removing the most highly erodible croplands from production first (table 2). Nationally, per-acre soil savings have generally fallen with each signup.
That the CRP's objective of curbing commodity supply may be secondary and not primary is supported, but not proven, by the generally rising trend of rental payments from one signup to the next. This trend suggests that landowners/operators enrolled least productive croplands first. If supply control had been the primary purpose, the trend might have been one of declining rental payments.

The importance of supply control is suggested in several ways. Participants must retire a specified proportion of their commodity program base acreage. This sort of reduction decreases crop production and acreage eligible for program payments. In addition, the U.S. Secretary of Agriculture can select croplands that reduce both erosion and crop production when determining which acre bids to accept. Some argue that using the CRP to address both objectives undermines its conservation effectiveness. Eliminating the cropland base reduction requirement and targeting the program solely to marginal lands would be ways to improve erosion control (16). Finally, the USDA added a one-time $2/bushel bonus to increase enrollment of corn base acreage in 1987.

Turning to the second issue, clearly separating benefits and costs by policy objective could help GATT negotiators. Low-income countries, many of which are major importers, feel that high-income country environmental policies like the United States' CRP or the EC's extensification program that pay farmers to retire cropland are no different than trade-distorting provisions of commodity policy (7). In their view, both CRP-/extensification-type mechanisms and commodity support programs tend to reduce commodity supply and raise prices. Given inelastic commodity demands, the result is higher gross producer revenues in exporting countries and higher food costs in importing countries. Negotiators for low-income countries may feel public payments made to producers to protect the environment

| Table 2--Selected indicators of the Conservation Reserve Program’s performance |
|--------------------------------|----------|----------|----------|----------|----------|----------|
| Indicator                     | Signup period 1/ |
| Enrollment (million acres)    | 1        | 2        | 3        | 4        | 5        | 6        |
| Average rental rates ($/acre/year) | 42.06    | 44.05    | 46.96    | 51.19    | 48.03    | 47.90    |
| Soil saved (ton/acre/year)    | 26.00    | 27.00    | 25.00    | 19.00    | 17.00    | 18.00    |


Sources: (19, 21).
are explicit income subsidies in disguise.\textsuperscript{18} The publicized concern of U.S. and EC leaders over the need to trim agricultural program costs lends credibility to the viewpoint of low-income countries.

Because separating resource policy effects unambiguously by objective is a difficult task, a detailed taxonomy of policy tools that ranks each by degree of effectiveness and cost (private and societal) in achieving specific objectives would be useful. Analysts could include both existing and past policy mechanisms. The taxonomy could also describe the effects each tool has on nonresource policies that are trade distorting.

Some examples of policy tools and effects illustrate the taxonomy concept. Public purchase of cropping rights on highly erodible land in perpetuity clearly achieves soil loss objectives, but the measure's permanent nature makes it useless for managing commodity production. Alternatively, public rental of annual cropping rights on highly erodible land could meet soil loss reduction and supply control objectives. Or, public purchase of annual cropping rights on only prime cropland would clearly meet supply control objectives but would be an inefficient tool for reducing soil loss.

Turning to the third issue, GATT negotiators may want to consider how this guideline should be modified for low-income countries. Negotiators may decide to collapse the two-step process, of initially accepting a conservation policy and then modifying its trade-distorting provisions, into one step: simply accepting resource conservation policies. The GATT has a precedent on such a decision. At Punta del Este in 1987, GATT signatories agreed that government intervention in developing countries may be justified, for example, to help develop an infant industry or resolve balance-of-payments problems (9). This concept of "different and special" treatment is embodied in the CAIRNS group's GATT reform proposal.

Negotiators may also modify the guideline for "small" countries. By definition, actions of small countries do not affect and therefore cannot distort world commodity markets. Thus, resource policies with obvious supply control objectives may be allowable if they are policies of small countries.

\textsuperscript{18} Some high-income countries and the world community are advocating greater environmental protection in the developing world. For example, U.S. policy dictates that for the United States to continue participating in multilateral banks, the lending programs be "vigorously implemented to promote environmentally sustainable economic growth and sustainable management of natural resources" (17). Partly as a consequence of this policy, the World Bank restructured to include a new central Environment Department and four regional units (4).
Guideline B

GATT negotiators could publicly recognize that countries differ in their viewpoints on the inability of markets to price some natural resource goods—wildlife habitat, for example—at their societal value. Negotiators could accept, without reform, policies established to correct resource market failures. Examples of such policies include producer payments to retire fragile lands for multiyear periods, taxes on high levels of chemical use found to leave toxic residuals in public water sources, and restrictions on converting wetlands to rangeland or cropland. High-income countries now primarily, but not exclusively, recognize resource market failures and the resulting implicit subsidies to resource users. Most low-income countries recently have set up ministries of environment, but ministry authority varies greatly from country to country.

Negotiators could benefit from a greater understanding of what constitutes resource market failures and implicit subsidies to environmental resource users. GATT member nations could sponsor research in selected low- and high-income countries to estimate differences in private values and societal values for a variety of natural resources. This research would complement the taxonomy suggested in this report by identifying the mechanisms that local, regional, and national governments use to provide these nonmarket-priced resources to future generations.

GATT participants may also benefit by studying implications of incorporating implicit resource subsidies into the negotiating framework. Such research could help trade talk officials decide whether to include implicit resource subsidies in the PSE or to keep them apart but still consider them as relevant for negotiations.
References


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