

Environment benefits from removing trade restrictions and distortions: background for WTO negotiations

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Summary

The interaction between environmental policies and trade policies emerged as an issue at the end of the Uruguay Round of trade negotiations in 1994. It has been feared by developing countries as a potential excuse for protection, but the work of the Committee on Trade and the Environment at the WTO has tried to shift the debate to looking also at ways in which improving access by developing countries to developed markets can lead to more environmentally friendly production, in addition to the conventional gains to income and development from trade and the potential effect of reducing poverty on increasing care for the environment. The CTE has provided a forum for discussing some of the issues and started to identify products, but there is now a need to clarify the analysis and look at products in more detail.

Liberalising trade improves the efficiency of production by allowing production to shift to the cheapest location. The objective of an environmental approach is to seek liberalisation of those products where that increase in efficiency is particularly concentrated in efficiency with respect to processes which might damage the environment. This criterion can be added to the conventional negotiating objectives of finding products with severe problems of access and a significant impact on the exporting economy. Because developing countries already have a range of schemes giving preferential access to developed countries, analysing the effects of any new preferences or improvement in access can be complex; the clearest possibilities are likely to be found among goods where developed countries subsidise domestic production because there has been less liberalisation at multilateral level and there are few examples of preference.

These criteria and the suggestions made in the discussions at the WTO give a preliminary list of products to consider. For some there is a clear potential for reforms in trade policy and subsidies to help both development and the environment:

Fish: this faces high tariffs in some markets and significant subsidies in many developed countries. The regime for foreign ships in some developing country waters provides insufficient payment and little control on over-fishing. Measures to remove trade distortions could reduce over exploitation and transfer some income to developing countries.

Meat and sugar: these face high tariffs, restrictive quota regimes, and domestic subsidies in developed countries. There is evidence of environmental damage from over-production.

Cotton, textiles and clothing face high tariffs and (at least until the end of the Multi-fibre Arrangement in 2004) restrictive quotas. Clothing is also a traditional route into manufacturing for developing countries, so if liberalisation permitted more countries to move into this sector, there could be significant development effects.

Fish, meat and clothing are particularly interesting goods to liberalise: as well as the effects on efficiency, the environment, income, and development, there are potential effects on poverty in developed countries because all take a greater than average share of spending of poor households.

Coal: subsidies and other encouragement of domestic production in developed countries restrict access by developing countries; developed countries would see a clear environmental gain from liberalisation.

Ethanol: a substitute for other fuels with advantages of sustainability and environmental effects of production. Subsidies to domestic fuels in developed countries may restrict its access, but it is not certain whether it would be competitive even in the absence of market distortions.

Jute: natural fibres face problems of access because competing synthetic fibres may not face the full costs of production, partly because of subsidies to energy.

Non-ferrous metals: these also face competition from production in developed countries which benefits from low-cost energy, and some products face high tariffs.

Other goods have less clear environmental benefits, but could benefit some countries.

Cocoa, coffee, and tea: these still face high tariffs, particularly on processed forms. Liberalisation could both increase income and allow diversification into processing in developing countries.

Fruits and flowers: Many face high tariffs, and some, restrictive quotas. They are also goods for which demand is growing and diversifying as incomes increase in developed countries. Liberalising them could therefore give useful opportunities for developing countries to diversify their production and exports.

Environmental goods: (goods used to protect or clean the environment) liberalising these could improve efficiency of production, and lower costs for developing countries, but it is difficult to define such goods in a trade-consistent manner, and the present structure of their trade suggests that the effects would be small.

Wood and other forest products: encouraging sustainable production in developing countries has clear environmental benefits, but trade measures may not be able to help directly. There are few tariffs or other interventions, and there are universal problems of low and long-term returns. Some initiatives from environmental policy may be more relevant. Some non-wood products (nuts, spices, oils and gums) do face high tariffs, and reducing these may provide indirect encouragement for forests.

Any policy on trade in environmentally friendly goods must meet the normal rules of the WTO, and therefore it is necessary under current rules to find forms of liberalisation which are non-discriminatory (at least among developing countries at a similar income level), and which are directed at specific products, not methods of production. There are also initiatives in environmental negotiations, which could impose new rules on fishing or provide new benefits for forestry which could supplement any action on trade, and on property rights which raise issues about national or international standards.

Trade liberalisation, particularly removal of subsidies, could be an important stimulus in some products, and may be a condition for progress in others. It would need to be accompanied by measures to correct transitional and other unintended effects, to help developing countries to meet administrative, legal, and technical requirements, and by initiatives specifically targeted at environmental problems. There is a need for the international agencies to improve data on subsidies and on environmental costs to apply the analysis. Environmental arguments could be a stimulus to make advances on trade

liberalisation which have been unable to secure sufficient support for economic motives alone. But the linking of economic and environmental goals implied by the discussions for which this paper is background raises important issues about how the international system can manage not only conflicting interests, but potentially conflicting ways of defining interests: economic, the long term sustainability relevant to environmental questions, the new emphasis on property rights, as well as the traditional other interests of governments, including protection of industries. The economic framework in this paper can only offer partial answers.

Introduction¹

At the beginning of the Uruguay Round, in 1985, the main goals of the principal negotiating countries were increases in market access (especially in agriculture) and extension of the responsibilities and discipline of the GATT (General Agreement on Trade and Tariffs) to new areas of trade, again including agriculture, but also services and intellectual property. As the Round proceeded, however, other 'new areas' assumed increasing importance, partly because of their relevance to trade, but also because of progress being made in other international negotiations. The environment was the most prominent among these: not only was there increased concern within developed countries, but binding international agreements were being signed, which meant a potential conflict between international jurisdictions.

In the latter stages of the Round, the potential difficulties associated with successfully managing the interactions between trade policies and environment policies became apparent to WTO Members. As a result, a Committee on Trade and the Environment (CTE) was established by the WTO General Council in January 1995.² Its responsibilities suggest concern about a wide variety of issues. The CTE was to report to the first Ministerial Conference. This report, after heavy negotiations, was adopted in Singapore.³

The discussions and papers of the Committee raised important questions about the relationship between trade and the environment, and started to identify some sectors where liberalisation or other WTO agreements on action could benefit the environment. This paper will attempt to go further, and help to identify the most relevant sectors or products for negotiations. It will first summarise how the issues have been raised at the WTO.⁴

The second section will present a simple analytic framework to identify the conditions required for liberalisation to contribute to trade and environmental objectives. This will be used in the next section to identify criteria for choosing products. Products which meet the criteria or which have been suggested by countries in WTO negotiations or by analysts will be discussed, to suggest how important removing barriers might be. Data on trade, tariffs, subsidies and environmental impact can indicate those products where liberalisation could have major effects, and help to and identify which countries are most likely to be significantly affected.

The last two sections will consider the international policy context which sets some parameters for what policies can be or are likely to be followed, and then suggest recommendations. All the analysis of this paper must be considered in the context of all other

¹ Comments, suggestions, and clarifications from officials of importing and exporting governments, and from multilateral organisations are gratefully acknowledged. Paul Barbour, ODI, provided useful research assistance, and Michael Richards, ODI, and William Masters, Purdue University, gave advice on the issues raised here.

² For the CTE mandate and terms of reference, see the Marrakesh Ministerial Decision on Trade and Environment, April 1994.

³ See *Report (1996) of the Committee on Trade and Environment*, WT/CTE/, 12 November 1996, referred to as CTE Report, 1996.

⁴ The Committee has also dealt with other questions, notably the impact of environmental regulations within developed countries on access for imports from developing countries. This form of interaction between trade and environment policy, the potential for environmental measures to be used, intentionally or unintentionally, to restrict imports from developing countries, is not discussed in this paper.

international policy objectives. Trade policy is not the principal tool for environmental aims and it has many other objectives. At a minimum, an 'environmentally friendly' trade policy could ask, for any trade measure, what the effects on the environment in importing and exporting countries would be, including the country distribution of effects: an environmental assessment. A stronger move to environmental concern would be to ask which measures are most damaging, while a concern for development could, in addition, use this approach to ask what measures could most benefit particular countries.

The WTO background

The CTE has structured its work around the ten items listed in the Decision on Trade and Environment. One of the most important has proven to be agenda Item 6. The formal requirement is for the Committee to address:

The effect of environmental measures on market access, especially in relation to developing countries, in particular to the least developed among them, and environmental benefits of removing trade restrictions and distortions.

It is under this that the CTE has discussed how the WTO can contribute to making international trade and environmental policies support each other through other trade liberalization and appropriate national policies for sustainable development. This emphasis on developing country market access has meant that the question of developing country import liberalisation has not been prominent in the CTE's work and this paper will therefore not consider that question. Liberalisation by developing countries could, however, improve their income and environment, under the same conditions and assumptions which we use here for developed countries. The impact of any individual country, however, would be smaller. The products which are heavily protected are similar.

The discussion has been based on two premises: that poverty is a basic cause of environmental degradation in many Member countries, so that the contribution trade can make to the eradication of poverty by raising income levels is an indispensable requirement for the promotion of sustainable development; and secondly that it is not trade that is generally at the root of environmental degradation, but rather unsustainable production and consumption processes. But in practice, the proposals made in individual country submissions have emphasised trade policy changes.

Policies should follow three principles: 'common but differentiated responsibility' to be shared by all WTO Members; policy measures applied to promote the internalization of environmental costs should not distort international trade and investment; WTO Members should cooperate to promote a supportive and open international economic system that will lead to economic growth and sustainable development in all countries to combat the problems of environmental degradation. (CTE Report 1996, paras 92-122, 195-199)

The general thrust of the discussion has been that the positive relationship between the removal of trade restrictions and distortions and improved environmental quality can be fostered through:

- (a) more efficient factor-use and consumption patterns through enhanced competition;

- (b) poverty reduction through trade expansion and encouragement of a sustainable rate of natural resource exploitation;
- (c) an increase in the availability of environment-related goods and services through market liberalization;⁵ and
- (d) better conditions for international cooperation through a continuing process of multilateral negotiations.

As far as the specific links between the removal of trade restrictions and environmental benefits are concerned, the Committee has acknowledged that trade restrictions and distortions can lead to an inefficient allocation of resources, hold back income growth, particularly in developing countries, and artificially shift resources into activities which place additional pressure on domestic, environmentally sensitive resources. Reducing or removing them would help to correct this.

The focus has been on trade liberalization in favour of products of export interest to developing countries as this is seen as a fundamental requirement to help them achieve sustainable development, with an emphasis on the importance of market access opportunities in assisting developing countries obtain the resources to implement adequate developmental and environmental policies at the national level, to diversify their economies, and to provide income-generating activities for the poor. The argument is that improving market access opportunities and preservation of the open, equitable and non-discriminatory nature of the multilateral trading system is essential for supporting countries in their efforts to ensure sustainable management of their resources. How can the removal of trade restrictions and distortions, in particular high tariffs, tariff escalation, export restrictions, subsidies and non-tariff measures, have the potential to yield benefits for both the multilateral trading system and the environment? There are two ways of interpreting the impact of increased income on the environment: environmental concern is seen as a form of consumption, with a high income elasticity: high income consumers choose to take some of their consumption in the form of environmental improvements; alternatively, poverty puts pressure on countries to increase income by any means available, including those which may cause damage to the environment. These are two sides of the coin: the value of the environment relative to other goods rises with income.

At the sectoral level, discussions in the Committee centred on agriculture and energy (led by countries' position papers), but it was thought that the Committee should broaden its analysis to other sectors. The CTE Report 1996 singled out the following sectors: tropical and natural resource-based products, textiles and clothing, fisheries, forest products, environmental services and non-ferrous metals.(CTE Report 1996 para 198) It was agreed that further analytical work and empirical evidence, taking into account country-specific natural and socio-economic conditions and the specific sectors and measures involved, would be necessary to deepen the analysis.

The WTO Secretariat therefore prepared a background paper on agriculture, energy, fisheries, forestry, non-ferrous metals, textiles and clothing, leather, and environmental services (WTO 1997). This report outlined the most prevalent trade restrictions and distortions in each sector and the environmental benefits associated with their elimination. The objective was to identify 'win-win' situations for trade and the environment. The general conclusion drawn from the sectoral analysis was that if adverse production and consumption

⁵ As with other trade liberalisation proposals, however, the emphasis has been on liberalisation in developed countries.

externalities are adequately integrated into decision-making processes, trade and environmental objectives support each other. Following the Secretariat's study, delegations to the CTE presented positions on some of the sectors.

It is clear that there remains a need for greater specificity as to what products that could be candidates for 'win win' scenarios. The objective of this paper, therefore, is to develop an analytic framework for identifying the direct interactions between trade and environment policies, and use this to examine some of the sectors suggested by the CTE. (The broader assumption, that economic growth reduces environmental pressure, is not tested).

Environmental gains and trade liberalisation

Assumptions about environmental gains

Identifying the effect of any particular trade policy change on the environment requires assumptions about a series of steps: about responses to price changes, production conditions, and policy and environmental preferences. To provide a 'complete' answer or set of policy recommendations would clearly require more data and more knowledge of economies than could ever be available. And governments (and private actors) have goals other than those discussed here, the environment plus simple measures of economic welfare. Identifying how to increase these gains may not be, therefore, a sufficient reason for governments to accept tariff changes. But these reservations about data and policy apply equally to measuring the effect of any trade policy change on simple economic welfare. Therefore, it is as valid to suggest the potentially large direct effects, with some discussion of the possible indirect effects which could offset these, and to use these to make policy recommendations, in the case of the environment as in the case of other trade policy. The case of the environment may seem more difficult because there is less consensus on either the weight to be given to environmental considerations or what is necessarily 'good' or 'bad' for the environment than for welfare, but even this may exaggerate the differences. Questions of income distribution, types of employment, etc., can be equally serious obstacles to weighting welfare choices. The one important difference is that environmental analysis is less familiar, and therefore this report will start by describing some of the questions that need to be asked.⁶

If all consumers and policy-makers have the same perceptions (valuation) of environmental costs and benefits, and if the economic and regulatory systems of all the countries involved ensure that these are fully included in production decisions (full internalisation), then any reduction in costs through a move to a more efficient type of production or location of production, in particular through the change in relative prices which results from changes in tariffs or other trade policy changes, will either lower environmental costs (if that is where some or all the saving is found) or lower other costs by enough to compensate for any rise in environmental costs.⁷ In looking for 'environmentally friendly trade liberalisation', we are seeking those cases where a relatively large cost reduction can be

⁶ This paper will look only at the environmental effects of production, not those associated with consumption. The argument that countries that permit production of a product can be assumed to accept the environmental effects of this process could be assumed to apply to consumption as well.

⁷ To put it more precisely, liberalising trade will shift production according to comparative advantage, so that it is the combination of production in the trading countries which will be more efficient than in the pre-liberalisation situation.

produced for relatively small (or easy) trade liberalisations, and where the cost change is likely to be concentrated in environmental costs. All trade negotiations look for the former, an increase in efficiency through relocation of production; the innovation is to look specifically for products where the efficiency gain is principally with respect to environmental costs (rather than labour or capital).

An apparent complication arises if the costs are not fully internalised, whether through deliberate choice, if different countries value environmental costs differently, or through inadequate regulations or enforcement, perhaps because a country is too poor or lacks appropriate training. But these are not different in kind to the problems found in other appraisals of costs and benefits, and welfare comparisons, and should not be obstacles to finding deals considered beneficial by both sides. If, for developed country importers, the pricing and incentive structure is such that the full costs of any activities perceived to be environmentally damaging are included in their prices of traded goods, and if enforcement of this is assumed to be feasible, a shift to more efficient production can be assumed to have, net, a good environmental effect there. In developing countries, particularly if protecting the environment is a 'high income elasticity' form of consumption, the internalisation may not be the same, but it need only reflect the costs as seen by society there. Unless there are international impacts (on atmosphere or oceans, for example) or existing international rules (the CFC convention, for example), normal trade rules would accept that countries should choose their own regulations in this field. If, however, the developing country is not able to enforce the degree of internalisation which it desires, whether because of the cost of enforcement or because of lack of trained inspectors or adequate legal frameworks, then there may be an increase in environmental damage which is not adequately reflected in costs. This would limit the applicability of the analysis used here, but it is a problem that arises in many analyses of impacts on developing countries.

There might be an additional question: does the legal system offers adequate regulation and enforcement of property rights to ensure that any costs which are considered important are appropriately internalised. If countries believe that there could be an external interest there, it would be in ensuring that the processes, of setting and enforcing regulations, are sufficient, not in deciding the form or coverage of the regulations themselves. If developing countries internalise sufficiently in line with acceptable procedures and face no more than normal enforcement problems, then we can assume that any change induced by changes in trade policy produces at least an acceptable environmental result. The divergence of views on what constitute environmental costs could be held to prevent any concept of a world environmental effect, but (again) this is a problem which has been faced, and ignored, in calculations of world economic welfare effect. It is simply necessary to assume that environmental effects are seen as smaller in the producer to which production moves for efficiency reasons than they were in the formerly protected producer to be able to conclude that there is a net world benefit.

If environmental costs are internalised to high income country standards in the developing exporter, the gain will be greater, and more clearly calculable at world level, but even without this, net world environmental gains, by high income standards, are likely: many environmental costs are associated with production intensive in (costly) inputs to offset natural disadvantages (overuse of fertiliser behind agricultural tariffs is the conventional example). If the barriers which allow these costs to be incurred are removed, production may move to a location which does not use damaging inputs, regardless of any absence of local regulations.

In looking at the effects of changing trade policy in developed countries, the costs are losing whatever benefits were intended to come from the tariffs; the benefits are first, from a conventional point of view, the welfare and environmental benefits of liberalising trade, but second (from an altruistic or development point of view) the welfare benefits, less any environmental costs, in the exporting country. We must be cautious about assuming that the benefits will be valued more highly than the costs: the fact that the trade policies to be changed are currently distorting production, and therefore damaging the environment suggests a high value for whatever goal tariffs are promoting; it is, however, also possible that concern for the environment is now rising.

There will be the additional benefit to the environment (in an absolute sense) from the increase in income resulting from trade liberalisation, if this increases the valuation of environmental gains in either importer or exporter (the association between poverty reduction and environmental gain which has been, officially, the gain most cited by the CTE). If environmental costs are given more weight in developed countries, however, this would suggest that, at least initially, most of the benefit would be there. We do not make any allowance for this. It would increase benefits, but not alter their distribution.

The question of which goods offer the largest environmental return for a transfer of production from developed to developing requires detailed individual analysis, taking into account the fact that production conditions will differ not only between developed and developing but among developing countries, particularly for primary products and others closely linked to local conditions. Any judgment must take account of where production is likely to respond to a change in trade policy.

A change in impact on the environment can come from a change in the level of production, from a change in the processes used for the same product, or from a shift among products. These are not completely independent, as a change in choice of the most efficient process may come from a change in the level of production, as well as from changes in relative costs or technology. If a good is being produced at above its efficient level of production (in the importing country because of the tariff), it may be being produced in a more inefficient way, either because of a constraint on inputs (the traditional Ricardian case of higher agricultural output forcing farmers on to ever worse land) or because the higher price makes even costly forms of production profitable (use of excessive pesticides, fertilisers, growth hormones, etc.). Changes in process, however, may not be entirely reversible (although some analysis, for example WTO 1997, p. 10, implicitly assumes this), because of the cost of changing. The analysis in the next section does not assume reversibility, which could increase the size of effects, but not change the distribution. The differences among products should (on the efficiency assumptions above) be included automatically in the effects, but with the same reservations on different valuations of the environment. The scale effects seem unambiguous (except for environmentally beneficial production: see below).

Forms of trade liberalisation

Trade liberalisation can take different forms. In terms of measures, it may mean removing conventional barriers, tariffs or non-tariff, or, within this, changing to a less discriminatory structure of barriers (reducing bias against processed goods through tariff escalation, for example). It can also mean removing other distortions which restrict the trade of other

countries. As subsidies are now actually or potentially subject to WTO rules, it can include ending subsidies to exports, producers of exports, or inputs to exports. In principle, it could also mean other ways of reducing the costs of trade, for example those which made up the 1992, Single European Market, programme, but these are not considered here. Except for goods where a country applies the same tariff to all trading partners (or where a domestic good is subsidised equally relative to all external production), trade liberalisation must also be classified by 'to whom' or 'relative to what'. If a good is already subject to preferences, or if the liberalisation takes the form of preferential liberalisation (for example to all or some developing countries) then the analysis of effects must (like analysis of welfare effects in trade) look at the consequences of the trade creation and diversion effects, not simply those of trade liberalisation, on production and therefore the environment. In this paper, our interest is in policies and negotiation for individual products and therefore in principle (if the trade classification is sufficiently fine) any policy change will produce either trade creation or trade diversion, although clearly a complete package is likely to have elements of both.⁸

The question of distortions within distortions, for example through tariff escalation, is potentially important given that one of the instruments of development is likely to be encouragement of a transition towards a higher share of processing in the economy. There can be disagreement over the argument for infant industry protection or special preferences: that developing countries require temporary assistance to meet barriers to entry into a new form of production. What is quite certain, however, is that development is obstructed by deliberately raising the barriers to processed goods, which is the effect of tariff escalation. Even if the processing increases environmental costs in the new manufacturing country, if this is a transfer from a less efficient country, there is still environmental benefit. Reductions in tariff escalation which brought environmentally beneficial trade liberalisation would produce not just 'win-win' on trade and environment, but 'win-win-win', with a structural change effect as well. An additional benefit will be any saving on transport costs (OECD Tariff Escalation, 1998) because more processed forms of a good tend to be lighter. In practice, it is difficult to differentiate between the liberalisation and removal of escalation cases. Examination of current (GSP) tariffs suggests that there are very few products where there is now significant tariff escalation, except where there is a rate of 0 for unprocessed products and positive rates for semi-processed and processed. Therefore, removing all tariffs on processed forms of the products would be equivalent to removing tariff escalation in these cases.

This raises the question of whether there can be any presumption that in general agriculture or manufacturing is more likely to be environmentally damaging in developing countries, or more precisely, whether transferring primary or secondary production from developed to developing countries offers greater advantages in reducing total environmental damage. It is probably impossible to make any generalisation that is useful for detailed trade negotiations. Clearly agriculture tends to be the most protected sector in developed countries, so this could lead to a presumption that it is the most inefficient, and therefore the most environmentally costly. This would imply a potential conflict between policies with higher

⁸ The form of the liberalisation matters. If it is a liberalisation of MFN rates, and if GSP rates are already 0 or negligible, this will be a liberalisation of developed countries relative to developing. This case is not included in the framework, because it is clearly not in accordance with the purpose of this study; it could produce trade 'undiversion' from developing to developed countries. If, however, there is uncertainty around the survival of GSP, then MFN rates may be targeted, not only to secure further liberalisation, but to preserve the liberalisation available up to now under GSP; the benefit or cost of a change is therefore sensitive to the timing and expectations of other changes.

than average effects on the environment and those particularly favourable to structural change, but as other primary production tends to be much less protected than average, on balance there is unlikely to be an important conflict of interests. For some primary products, for example trees as carbon sinks or in zones of erosion, increases in production may be not merely less damaging than equivalent production in the developed country, but actively beneficial. Any cases of this type should be particularly sought.

Analysis and classification of the effects of trade liberalisation on the environment

Framework of analysis

Table 1 presents the range and direction of effects of different trade policy changes, under different assumptions about whether they are trade creating or diverting. The five sets of columns refer to:

- The developed country/group of countries which liberalises its imports;
- The developing countries towards which the change in tariffs is targeted;
- Any other developed countries, not joining in the liberalisation;
- Any other developing countries, not included in a preference arrangement (or countries included in the policy change, but not producing/importing the product liberalised);
- The world.

For each, the columns give the sign of effect on:

- Net exports of the good liberalised
- Output of other goods
- The degree of product processing
- The environment
- National income

Four cases of liberalisation are considered, with the second and fourth each having two variants:

- All developed countries liberalise an import from all developing countries.
- All developed countries liberalise a good from some developing countries.
 - previously, all developing countries paid the tariff.
 - previously, only some developing countries paid the tariff.
- One or some developed countries liberalise an import from all developing countries.
- One or some developed countries liberalise an import from some developing countries
 - previously, all developing countries paid the tariff.
 - previously, only some developing countries paid the tariff.

Three types of liberalisation are considered:

- Removal of a tariff (or non-tariff barrier).
- Ending of tariff escalation on a good (by reducing to lowest tariff rate).
- Removing subsidies in the developed country which affect trading partners.

Table 1 gives the sign of the direct effects, on normal assumptions about responses to

changes in prices. A reduction in barriers will reduce local production of the good affected in the importer and increase imports (reduce net exports). It will increase production and exports in the developing countries whose exports are liberalised. In the table, the first column of each group, changes in net exports of the targeted good, will fall in the importing country and rise in the country towards which there is trade liberalisation. It can be assumed that there will be a corresponding output effect in the importing country (because if the good is not produced there, it is unlikely to be subject to import controls) and in the exporting country. There will be an increase in income in the importer because of the efficiency gain, and in the exporters from higher output. All these will affect inputs (and potentially complementary products). Because it is assumed that the principal environmental effects vary with the level of production, not consumption, of the good, lower output brings an improvement in the environment.⁹ The second round effects (the second line of each effect) are a substitute for using a general equilibrium model. They take rough account of what follows from the income effects. The increased levels of income (in the importer and exporter) following liberalisation increase demand in both importer and exporter, and therefore production of other goods (the second column) (and probably also increases imports). This has some environmental cost (from the higher level of production), but this is less than is saved, because, by assumption, the production is more efficient. Substitution effects could alter the balance between changes in other production and changes in target good production. In the case of changes in the relative protection of different stages of production (changes in tariff escalation), the change may be in the nature of production (in processing), not a change in the absolute quantity of output.

All the cases assume that there is sufficient elasticity of supply in the developing countries towards which trade is liberalised to meet at least some of the increased demand. Although it is possible that some goods where there is no possibility of increasing exports could be liberalised as part of a package (or if there is insufficiently precise classification of goods), the effects would be mainly on income or felt by those suppliers which could increase production. It would, however, be pointless to recommend such goods as part of an environmental policy.

⁹ A full life-cycle analysis might produce different results; if the effects proportional to consumption are more important, the argument for liberalising is weaker.

Table 1: Analysis of environment and trade effects

	Developed importer					Developing exporter					Other developed					Other developing					World	
	Net Exp	Oth out	Proc	Env	Inc	Net Exp	Oth Out	Proc	Env	Inc	Net Exp	Oth out	Proc	Env	Inc	Net Exp	Oth out	Proc	Env	Inc	Inc	Env
All to all																						
Tariff																						
Creation	-			+	+	+			-												+	+
2 nd	-	+		+	+	+	+		-	+		+		-	+		+		-	+	+	+
Diversions	-			+	-	+			-	+		-		+	-						-	-
2 nd	-	-		+	-	+	+		-	+		-		+	-		-		+	-	-	-
Escalation																						
Creation				-	+	+			+	-											+	-
2 nd		+		-	+	+		+	+	-	+		+		-	+		+		-	+	-
Diversions									+	-	+				-	+					-	-
2 nd		-		+	-		+	+	-	+		-		-	+		-		+	-	-	-
Subsidies	-			+	+	+			-	+											+	+
2 nd	-	+		+	+	+	+		-	+											+	+
All to some																						
Tariff																						
Creation	-			+	+	+			-												+	+
2 nd	-	+		+	+	+	+		-	+		+		-	+		+		-	+	+	+
Diversions	-			+	-	+			-	+		-		+	-				+	-	-	-
2 nd	-	-		+	-	+	+		-	+		-		+	-		-		+	-	-	-
Undiversions						+				+										+	-	+
2 nd		+		-	+	+	+		-	+		+		-	+		-		+	-	+	+
Escalation																						
Creation				-	+	+			+	-											+	-
2 nd		+		-	+	+		+	+	-	+		+		-	+		+		-	+	-
Diversions				-	+	-			+	-	+				-	+				-	-	-
2 nd		-		-	+	-		+	+	-	+		-		-	+				-	-	-

	Developed importer					Developing exporter					Other developed					Other developing					World	
	Net Exp	Oth out	Proc	Env	Inc	Net Exp	Oth Out	Proc	Env	Inc	Net Exp	Oth Out	Proc	Env	Inc	Net Exp	Oth out	Proc	Env	Inc	Inc	Env
One developed to all																						
Tariff																						
Creation	-			+	+	+			-												+	+
2 nd	-	+		+	+	+	+		-	+		+		-	+		+		-	+	+	+
Diversion	-			+	-	+			-	+				+	-						-	-
2 nd	-	-		+	-	+	+		-	+				+	-				+	-	-	-
Escalation																						
Creation				-	+				+	-											+	+
2 nd		+		-	+		+	+	-	+				+					+	-	+	+
Diversion				-	+				+	-				+	-						-	-
2 nd		-		-	+		+	+	-	+				+	-				+	-	-	-
Subsidies																						
Creation	-			+	+	+			-	+				-	+						+	+
2 nd	-	+		+	+	+	+		-	+				-	+				(-)	(+)	(-)	+
One developed to some																						
Tariff																						
Creation	-			+	+	+			-												+	+
2 nd	-	+		+	+	+	+		-	+				-					+	-	+	+
Diversion	-			+	-	+			-	+				+	-				+	-	-	-
2 nd	-	-		+	-	+	+		-	+				+	-				+	-	-	-
Undiversion						+			-	+									+	-	+	+
2 nd		+		-	+	+	+		-	+				+					+	-	+	+
Escalation																						
Creation				-	+				+	-											+	+
2 nd		+		-	+		+	+	-	+				+					+	-	+	+
Diversion				-	+				+	-				+	-				-	+	-	-
2 nd		-		-	+		+	+	-	+				+	-				-	+	-	-

If there is trade diversion, then there will be a negative income effect in the liberalising country. The liberalisation permits an increase in imports from a country which is not the most efficient producer, so although the price to the consumer of the import is lowered, this is more than offset by a loss of tariff revenue. Although some exporters will gain, others lose. It could be argued that goods where trade diversion is likely should also be excluded, but if this is diversion from developed countries to all developing (the first case in the table), it may contribute to an efficient solution in the long run: it may be acceptable to offer a preference to encourage the start of production (or of a particular stage of production) in a country where it will be efficient in the long run (the traditional justification for preferences or infant industry protection). Diversion because of a preference (or increased preference) for one group of developing countries over another would be harder to justify from a welfare or efficiency point of view, unless the preferred countries were sufficiently below the unpreferred in income for the same arguments to hold or there was a clear case where production of a good was more environmentally favourable in one location than another, for reasons that could not be changed by regulation.

There is also the important case of ‘undiversion’, where a preference for a limited group of developing countries is reduced by extending that preference to all developing countries. (There could also be undiversion by liberalising to developed countries.) Given the starting point of most developed countries, with a wide range of special preferences for different groups of countries, there are many more goods where this is possible than there are goods where there is a single tariff on all imports from developing countries, so to exclude consideration of these would severely limit available products. Any product on which there is no preference for any group of developing countries is likely to be either irrelevant to them or extremely sensitive.

Effects of removing barriers

If there is *trade creation*, this is beneficial to income in all areas under all cases (even countries not directly affected gain from higher world income in the second round). On balance, it is beneficial to the environment, because there is a transfer to more efficient (or less sensitive) locations. This is also the simplest effect, with fewest secondary effects on other countries (except for the obvious income ones).

If there is *trade diversion*, the first point to note is that there is always damage to the income of the developed country (because it loses the tariff revenue without the full compensating increase in efficiency), and although the fall in output (from the increase in imports because of the relative price effect of lowering a tariff) brings a reduction in environmental costs in the importer, this is more than offset at world level by the transfer of production from a more to a less efficient source. If the liberalisation is *to all developing countries*, this will be a transfer from some other developed country to developing countries, and may therefore have a compensating long-term development effect. If it is *to some developing countries*, then the transfer may be either from developed countries or from other developing countries. In the first round, the effect on the targeted (liberalised) developing countries is the same as from trade creation, but their second round benefits are lower because world income is reduced (it is increased in the creation case) so that the increases in both other output and the targeted good will be less. Other developed countries or other developing countries will be hurt by the diversion in the first round, and both will be hurt by the income effects in the second. The inefficiency brings damage, net, to income and the environment at world level. The more limited the area liberalised, the more likely is trade

diversion.

If there is '*undiversion*', extension of liberalisation from some developing countries to the rest, the effects are quite different. There is no immediate effect on the developed country, because it merely changes its source of imports; it had already sacrificed the tariff revenue with the original preferences. (It may gain from a switch to a more efficient supplier.) On the targeted countries, the effect is the same as for trade creation, but there is a loss for the previously favoured countries. In the second round, however, in contrast to the trade diversion case, the increase in world income means that there is some offset in the other developing countries, and in the developed countries. The case is not as unambiguously favourable as trade creation, but if the environmental effects from moving production to more appropriate locations are large, it may be worth doing. Such cases are, as noted, likely to be much more frequent than pure trade creation cases because of the large number of existing preferences.

Effects of removing escalation

For the escalation case, it is assumed that the primary products are produced in developing countries, while processing may be in either the country which starts with escalating tariffs (the developed importer in the table), in which case removing escalation brings trade creation, or in another country, either developed or developing. This must be a country sufficiently more efficient than the target developing exporter that it could overcome the disadvantage of the escalating tariff. Trade diversion is probably less likely in this case than in simple tariff removal cases, so that there is a better chance of finding trade creating products. Another possible case (with diversion) would be a removal of escalation for least developed countries, so that processing was moved from more to less advanced, and possibly less efficient, developing countries. If there is trade creation, again this is clearly beneficial to all, at least by the second round, and there is the additional benefit of an increase in processing in developing countries. If there is diversion, the same effects, depending on whether it is from developed or other developing countries, apply, although with the change happening to processing rather than to net output, and affecting income in that way.¹⁰

Effects of removing subsidies

It is unlikely that a removal of subsidies could have a discriminatory effect among developing countries.¹¹ Unlike a removal of tariffs, removing subsidies could lead to a reduction in the consumption of the good in the developed country, but there could still be an increase in net imports because a higher share of the reduced consumption would be imported. An interesting diversion effect here could be to favour other developed, if they still had their own subsidised production; they could benefit from the increase in income in the subsidy-removing developed country. This suggests that in this case multilateral action may be important. One problem (which is included in brackets in Table 1) is that for some goods (notably some foods in the Common Agricultural Policy, CAP, or under US farm programmes), the effect of the subsidy on production has been so large that it has induced

¹⁰ In some cases, developing countries subsidise processing to counter the effect of escalation. De-escalation could permit the removal of these subsidies, so the effect would be more on income than on output.

¹¹ Although there are some subsidies, such as those to fishing boats in coastal waters of developing countries, which could be used in this way, these are probably not used to favour the countries, but the boats, so a revised system would probably affect what was paid to the boats, not to the countries.

exports, rather than simply limiting imports. Therefore, some developing countries are benefiting from subsidised imports, and would lose income, and, therefore, lose other output. It would, of course, be possible to offset this by paying them directly more than the current subsidy to their imports for less than the cost of the subsidy in the developed importer (because of the efficiency gains) but this might be difficult to achieve. The welfare question is whether they would gain more from the potential increase in their exports because of the increase in world income than they would lose directly from the loss in subsidy. Other developing countries would gain.

Summary

Because of the difficulties of securing multilateral action in the current economic situation and the existence of preferences to some developing countries, the most likely case for tariff reduction is unilateral liberalisation on products where duty-free access is already available to some developing countries, for example, the EU could extend the access available to the ACP countries to all developing countries, or 'levelling up' the access developed countries give to least developed countries to apply to all developing. For some products, there might be trade creation (if no current preferred country is using the preference), but the most likely outcome is undiversion. The most likely case of action to help all developing countries would be in subsidy removal (One developed to all, subsidies). The next most likely set of cases is probably liberalisation by all to some, for example extensions of special access for the least developed to more products (all to some, tariff, undiversion). Here, trade diversion combined with undiversion is probably the most likely outcome, because the products most likely to be included (as shown in the first round) are those where there are already preferences for some developing countries.

For goods with similar production conditions and shares in output and consumption, the world gains are likely to be greatest for trade creation, with gains for developed countries in income and environment, and gains for developing exporters in income, with a small or 0 cost in environment. This is also the only case where the second round effects on other countries are all positive, an important consideration in a trade negotiation. If the effects which were excluded are included, in particular possible differences in environmental effects of different scales of production or different composition of production, the gains could be greater (if the developing country is able to shift from a less to a more efficient product, even the increased output may have no environmental damage. Antweiler et al. 1998 found that the composition effect of trade liberalisation on developing countries tends to move them in fact to more polluting industries (supported for Indonesia's trade with Japan by Lee, Roland-Holst 1993), but the changes in income and in techniques lead to less polluting output, if the full subsequent rounds effects are included (p. 39). There is some evidence of an increase in environmentally damaging industries in developing countries (Low 1992). If increases in income lead to more protection for the environment, this would increase the environmental benefits.

The matrix presented here is intended to show all the effects which must be considered for any proposed liberalisation. The next step is to try to identify products which are likely to have more or larger favourable effects.

Criteria for choice of products

Environmental criteria

There are no simple measures or databases which would allow us to apply the obvious criterion, the difference in environmental impact between developed importers and developing exporters. It is necessary to identify those products which are produced in (or by, as in the case of fish) the developed country in a particularly damaging way or where subsidies encourage over-production. This is more likely to have damaging effects on the world as a whole than tariff-induced inefficient location of production. This criterion suggests a range of forestry products, agricultural products, fish, leather and leather goods and energy products.

Trade criteria

Partly because of the lack of internationally comparable data on environmental effects, but also because we are looking for policy changes which would have significant effects on developing countries, we can also apply more conventional trade negotiation criteria, and then suggest that products identified in this way should have further study to determine which would meet the criterion of offering more than average environmental benefits.

The first criteria here are obvious: products with a high share in the exports of developing countries or facing particularly high barriers are most likely to show large effects, and possibly also to attract wide spread negotiating interest. But because both of these have been criteria for negotiators in all trade negotiations, there are unlikely to be easy policy changes that have not already been identified. This illustrates the principal difficulty of the strategy being analysed here. The products which continue to have high tariffs, especially those with high protection in spite of acknowledged environmental damage, are likely to be protected for strong political or domestic economy motives. Any proposals to liberalise them will face difficulty. New environmental arguments or increased environmental sensitivity may have weight against this, but conventional arguments of efficiency, development, or income have already been used.

Above average (5% or higher) tariffs are found on fish, some wood, wood products, and other forest products, fruits, sugar, flowers, meat, processed coffee, jute and leather products, aluminium products, and textiles and clothing.

Among the most important *non-tariff measures* affecting trade now are sanitary and phyto-sanitary requirements. Some may have a protectionist, as well as a sanitary objective, but it is unlikely that reducing these could be presented as an environmentally friendly reform. Sectors which remained subject to other significant non-tariff barriers after the Uruguay Round included coal, food, clothing and textiles, leather and rubber products.

The discussions in the CTE raised subsidies as well as tariffs and other traditional trade barriers, in particular in agriculture, fishing, and energy. Brazil (WTO 12 September 1995), Australia (WTO 11 April 1996), the US (WTO, 11 June 1996), and the Philippines (WT/CTE/M/16, 1997) emphasised internal taxes and agricultural subsidies as well. New Zealand noted that reforming its agricultural system had in fact led to 'less intensive production systems, less fertilizer use, less energy use in production, less specialization of production and less monoculture creating a more attractive landscape in some areas.

Marginal and easily erodible lands had been taken out of agriculture. A less obvious environmental benefit was that policy advisors previously responsible for administering a panoply of agricultural assistance measures were now free to face new challenges, including environmental policy challenges; (WT/CTE/M/16, 1997). New Zealand and the US cited the regimes for distant water fishing and domestic subsidies for fish (WTO, 1997, New Zealand and US submissions; and WTO 21 October 1996). Norway, supported by Nigeria, cited the use of subsidies to coal as damaging to the environment, especially combined with taxes on oil and gas (WTO, 11 April 1996; WTO, 11 June 1996; WTO 12 July 1996, WTO WT/CTE/M/16, 1997). Australia and Brazil also make the important point that the development effect may be not only from increasing individual exports, but from allowing developing countries to diversify their exports.

Much less progress has been made on *removal of subsidies* in previous WTO negotiations. Only in the Uruguay Round were clear understandings reached on agricultural and other subsidies, for what was forbidden and what was permitted. There may be more scope for negotiations and greater potential for 'large' effects. OECD (1998, p. 2, 11) estimates that agriculture, fish and energy are the most heavily subsidised sectors, along with transport and 'heavy industry'.

Other criteria

Looking for products where there is *more likely to be trade creation* than diversion or those where there will be 'undiversion' with limited damage to the country suffering the undiversion does not give obvious product lists. It will require examination of the trade changes from particular liberalisations. Where there is undiversion, it would be better to find examples where the products are more important, in share or potential for the new exporter than for the old exporter, or where the old exporter has inelasticities of supply (of the European special access arrangements under Lomé, perhaps only beef is an obvious qualifier). Where there is diversion from a developed country, for this to meet the efficiency criteria, this should be in industries where there are high set-up costs or barriers to entry, but this could apply to most forms of processing (where marketing, if not the production itself requires high initial investment).

To improve *developmental effects*: liberalising processing, by *reducing escalation*, may be possible in some cases, perhaps in wood, rubber, leather, coffee and cocoa, in some metals and in textiles and clothing. It would also be desirable to find products whose production processes could have redistributive effects, particularly increasing employment among the low income (work for unemployed women, work that can be done in association with agriculture, etc.). Any forms of limited processing might meet this criterion, but so also do some non-wood products of forestry (nuts, bark, dyes, etc.). These also have a potential additional environmental advantage of offering an alternative source of revenue from forests, perhaps limiting deforestation. Australia has emphasised agriculture as having the 'most direct' relationship to poverty (WTO, 11 April 1996), looking also at the environmental benefit from reducing poverty.

From the point of view of the *developed country*, there could be advantages to liberalising imports consumed by the poor, especially where the impact of the income increase will be large. The importance of finding such products will be increased if any of the subsidy removal proposed would increase costs to these consumers, e.g. of food. (This is more likely to be a problem of fish than agricultural products because of the different nature

of fish and CAP programmes.) Clothing and textiles could be candidates here.

The need to form alliances suggests that products with a *range of exporters* are more likely to be successful. On the other hand, developed countries (certainly as a group, usually individually) have bigger economies than their developing trading partners, and imports are normally less concentrated than exports in all countries, so that an import is likely to be a lower share of income in the developed country than the corresponding exports are of the developing countries' revenue. This could help developing countries, although it has clearly not been enough to ensure complete liberalisation in the past.

From a negotiating point of view, products which have *already been proposed by exporters* are obvious candidates. There have been special papers on fish and ethanol (WTO, 1997, W/CTE/W/51; W/CTE/W/52; 1998, W/CTE/W/98. The WTO paper on the environmental benefits of removing trade restrictions (WTO 1997) highlighted agriculture, energy, fishing, forestry, non-ferrous metals, textiles and clothing, and leather, reflecting products where this issue likely had been raised in CTE discussions.

In these discussions, agriculture had been particularly prominent: Australia emphasised that 'Over-use of resources and unsustainable practices could lead to severe land degradation', and has been supported by traditional Cairns groups allies, New Zealand and Uruguay, as well as by the US (WTO, 12 September 1995, WTO, 11 April 1996). Several also mention the effect of encouraging overuse of chemicals on land that is only made suitable for production by agricultural subsidies. Brazil mentioned barriers to soya (WT/CTE/M/16, 1997). In contrast to these, the EU, supported by Switzerland, argued that there were environmental dangers from extensive production (WTO, 12 July 1996).

Norway mentioned energy products (WTO, 11 April 1996). Among the tariff peaks, clothing and textiles were cited by Egypt, Switzerland Indonesia, Pakistan and India (WTO, 12 July 1996, WTO, CTE 11, 1996, 17, 1998).

Several delegations, including New Zealand (citing leather, forestry, mining, fisheries, and agriculture) and Egypt (citing textiles and clothing), Brazil (fish, forestry, clothing and leather), Malaysia (forestry) and Morocco, have mentioned products facing tariff escalation. (WTO, 12 September 1995; WTO, 12 July 1996, WTO, 20 October 1996,), and Nigeria noted the possible role of export subsidies as a counter to tariff escalation (WTO 11 April 1996). Canada cited a specific example from tariff escalation from pulp to paper, which causes environmental damage because of 'double drying' of the pulp (WTO, 21 October 1996 WTO WT/CTE/M/16, 1997).

As the citations here indicate, the countries principally interested in using the CTE appear to be, among the developed countries: Australia, New Zealand, Norway, and the US and among the developing: Argentina, Brazil, Uruguay, Egypt and Nigeria. Japan, the EU, and Switzerland were more hesitant, not accepting that subsidies to agriculture, fishing or energy were necessarily distorting or damaging to the environment.

Identification (or encouragement) of '*green products*: products produced in a more-than-averagely green or organic way could produce an additional list of products to be encouraged, but the trade and tariff classifications (and current rules of the WTO on discrimination) would not permit specific recommendations. A basic problem (UNCTAD EPPs, 1995, p. 5) is that 'there is no universally adopted definition or concept' of these

products. Such a definition would require not only better data to permit full life-cycle analyses, but international agreement on weighting different types and levels of environmental effect.

Where it is more likely to be identified is specific cases of damage which may themselves become the subject of safety or sanitary regulations. Developing countries may therefore need to prepare to comply with higher standards. The sectors in which this is likely to happen are of course the same as those already identified as particularly subject to environmental considerations in developed countries (as mentioned above). This suggests that there is a risk that liberalisation in some of these areas might give only a temporary opportunity. Then, developing country exporters might need to modify their own production methods to satisfy new international standards. This would affect the outcome here only where full internalisation of environmental costs would remove the efficiency gain from trade liberalisation. It will not, of course, apply to liberalisation where production in the developed country is environmentally damaging because its location or processes are inefficient because of price or other distortions. UNCTAD (Policy, annex, 1995) calculated the share of products 'potentially vulnerable to environmental policies' (table 2). It found that they were a higher share of both total and manufactured exports of developing countries than of OECD countries, with textile and electronics production particularly important in these shares. If electronics and paper and pulp.¹² are excluded, to correspond to the products identified here, the table identifies Asia as likely to be particularly interested in these products, with only the wood-producing African countries affected. In the other areas, fish and leather are also important. Clothing is the most widespread.

¹² Electronics are not included in the discussion here, because UNCTAD was unable to find a tariff classification to correspond to this. Tariffs on pulp and paper products were largely eliminated in the Uruguay Round, after the UNCTAD publication.

**Table 2: Exports to OECD of products which are potentially vulnerable to environmental policies, 1993
(as a percentage of total exports)**

	All Vulnerable Products	Fish	Wood & prod.	Pulp & paper & prod.	Leather & prod.	Cotton, textile, & prod	Electronics	Selected Manufactured exp (4, 5, 6) as % of total manuf. exports	
	1=(3to8)	2= (3-7)	3	4	5	6	7	8	9
Region, country or area:									
OECD	17.0	9.1	0.9	1.9	2.9	0.8	2.6	7.9	14.3
Developing Countries	31.5	20.7	2.7	2.4	0.4	3.1	12.1	10.8	42.1
Select developing countries and economies in transition									
Africa	14.7	14.5	2.7	2.3	0.1	0.7	8.7	0.2	47.4
Cameroon	23.4	23.4	0.1	22.7	0.0	0.1	0.5	0.0	9.5
Egypt	15.9	16.8	0.1	0.3	0.1	0.2	15.1	0.1	53.1
Zimbabwe	13.4	13.2	0.0	1.0	0.0	1.8	10.4	0.2	40.4
America	19.2	14.4	3.3	1.7	1.1	2.7	5.6	4.8	27.1
Argentina	16.2	15.2	8.4	0.5	0.6	5.2	0.5	1.0	28.4
Brazil	21.3	20.0	0.8	3.8	3.7	9.6	2.1	1.3	27.1
Chile	24.5	24.4	10.8	8.1	4.5	0.3	0.7	0.1	3.2
Colombia	10.0	10.0	1.9	0.1	0.2	1.1	6.7	0.0	40.1
Costa Rica	31.4	31.2	2.5	0.4	0.3	0.5	27.5	0.2	70.7
Jamaica	33.3	33.0	0.6	0.2	0.0	0.3	31.9	0.3	90.4
Asia	36.2	20.3	2.7	2.8	0.2	2.3	12.5	15.7	45.4
China	42.7	34.7	2.0	1.2	0.4	8.7	22.4	8.0	44.7
India	33.8	33.3	4.3	0.3	0.1	4.7	23.9	0.5	36.8
Indonesia	41.0	37.7	4.6	14.2	0.4	6.5	12.0	3.3	45.9
Malaysia	47.1	19.2	0.9	13.0	0.1	0.2	5.0	27.9	45.7
Philippines	38.5	27.4	4.5	2.0	0.6	1.8	18.5	11.1	42.5
Thailand	44.8	29.1	12.4	2.0	0.1	4.3	10.3	15.7	44.3
Vietnam	47.3	47.3	14.7	1.2	0.0	7.9	23.5	0.0	73.8

Source: UNCTAD secretariat calculations based on COMTRADE, from UNCTAD (1995) Environment, International Competitiveness and Development: Lessons from Empirical Studies. The Policy Debate on trade, environment and development. Geneva: UNCTAD Secretariat. TB/B/WG.6/Statistical Annex, TD/B/WG.6/10/Add.1

Products identified

These disparate criteria permit us to identify a small number of products which meet all or most of them: the products identified as having particularly important environmental effects, including those already under consideration by the CTE: wood and other forest products; coal and ethanol; some fish: mainly tuna; beef and chicken; leather. To these we add some which both are important in developing country trade and have particularly high trade barriers; production in developed countries can be expected, therefore, to be particularly inefficient, and any liberalisation could have significant effects. The environmental impact would require further study (and in some, there are important potential effects of trade diversion and undiversion): sugar; tropical beverages; some fruits; cut flowers; cotton and cotton clothing and textiles, and other fibres. Non-ferrous metals raise questions of energy use. Environmental goods are a small (and difficult to specify) group. The EU, US, Canada, and Japan were used to represent all developed country markets. The products chosen are about a fifth of their total imports from developing countries (table 3).

Table 3: Imports by principal developed countries of products in suggested sectors, 1996 (US\$ million)

	Total		Total
Wood		Trop. Beverages	
EU	4451	EU	7768
Japan	6635	Japan	1318
US	2690	US	3575
Canada	133	Canada	562
Nuts		Mangos	
EU	1017	EU	121
Japan	351	Japan	43
US	460	US	153
Canada	48	Canada	29
Rubber		Citrus	
EU	3632	EU	802
Japan	1456	Japan	23
US	3958	US	53
Canada	355	Canada	660
Other forest products		Bananas	
EU	679	EU	2354
Japan	357	Japan	865
US	455	US	1453
Canada	17	Canada	168
Coal		Cut flowers	
EU	911	EU	411
Japan	1094	Japan	77
US	220	US	584
Canada	22	Canada	40
Ethanol		Cotton	
EU	22	EU	19923
Japan	4	Japan	6837
US	19	US	20628
Canada	0	Canada	1228

Fish		Jute	
EU	972	EU	181
Japan	742	Japan	25
US	435	US	3
Canada	5	Canada	5
Meat		Non-ferrous	
EU	932	EU	9950
Japan	1007	Japan	7098
US	132	US	7713
Canada	15	Canada	716
Sugar		Env. goods	
EU	1736	EU	28
Japan	351	Japan	39
US	1218	US	276
Canada	134	Canada	26
Leather		<i>Total</i>	
EU	6392	EU	62283
Japan	1962	Japan	30284
US	5314	US	49339
Canada	455	Canada	4618

All imports from developing countries		Share of products in total
EU	409851	0.15
Japan	188123	0.16
US	374553	0.13
Canada	23529	0.20

Source: UNCTAD data base

Wood

Wood and wood products are not, in general, subject to high tariffs or other restraints, and the tariffs were substantially cut in the Uruguay Round, which also reduced the extent of escalation. (Tariffs and escalation do remain high in some developing country markets, Barbier et al 1994 p. 100.) Wood is important among developing country imports in all the countries (except Canada). In the EU, tariffs are 0 for unprocessed products, but are quite high for some processed and semi-processed products, including plywood, where even the GSP rate is 5-7%. (For comparison, the average developed country tariff after the Uruguay Round was under 4%.) For some more sophisticated products, the tariff is lower, at 3-4%. This is an odd pattern, not escalation, but high tariffs against precisely those products most likely to be of interest to developing countries. There are a large number of NTBs. US tariffs are lower, although on plywood they are still relatively high with some products at 6%, but for the US, GSP rates are all 0. (In contrast with the EU, some of the highest MFN rates are on the most processed, a more conventional escalation, going up to 12%.) A change in tariffs would not, therefore, benefit the developing countries, as long as GSP applies. It is fewer NTBs. Japan has even higher tariffs for plywoods, ranging up to 8-12%, but again with 0 for GSP. More processed woods are lower, at 3-6%. Technical standards account for a large number of NTBs. Canada has high tariffs, often around 6% on most wood and wood products, and for many, the GSP rate is still greater than 0, although about half the MFN. It

has a range of health and safety, technical, and packing standards. (Only a sectoral study could identify which technical barriers might be protectionist in intention.)

There are other barriers, but these tend to be unofficial (or potentially challengeable under the WTO) such as requirements for labelling or voluntary certification of the nature of the production.¹³ Some informational labelling, provided it is voluntary and by private sector organisations, is allowed under WTO rules (Ghazali 1998), but the certification regimes deal with processes, and appropriate processes will vary among countries according to national conditions as well as level of development.¹⁴ The most promising compromise between too many unrecognised and not understood standards and formal regulation may be the ISO system. But for any standard, the minimum costs of certification tend to be fixed and are difficult for a small (or new) producer to meet.

The role of trade incentives is complicated by two further questions. The literature in the field (e.g. Richards 1998, Kaimowitz and Angelsen, 1998) strongly suggests that the way in which incentives feed back onto different types of production is still imperfectly understood, so too much should not be assumed about the effect of trade liberalisation. In particular, individual countries show wide variations in deforestation and response to price changes, suggesting that other factors are more important. Some models assume that agriculture and forestry compete for land, while others find them complementary, giving contradictory implications for the effect of liberalising agricultural trade on forestry (a problem noted by New Zealand in CTE negotiations, WTO 12 September 1995).

Second, there is some doubt about the effectiveness of any feasible price incentives (Richards 1998) because of the necessarily long-term and low returns to forestry investment. Low, long-term returns are particularly serious in a developing country where normally the costs and returns to investment are higher than in developed countries, so that the pressure to find substitute investments for forests is even greater. With a high discount rate, raising current prices may encourage deforestation, and Kaimowitz and Angelsen (1998) have found that most models get this result (p. 85); low prices which are expected to continue may, however, discourage long-term investment, and thus also damage the environment (*ibid.*, p. 91). Any international action to raise prices or provide income (for example the debt swap mechanism or proposals for a tax on imported wood in developed countries which would be returned to the producers) would also fail to provide the direct, internalised, return which is needed to give an incentive to keep forests. There are also potential conflicts with incentives for other products considered here: if the problem is a relatively low return to forest products, improving the return to agriculture could displace forestry (through liberalising trade in some food products), and could offset any benefits to forestry from liberalising forest products. It is possible that there would be trade diversion from advanced developing countries if there was liberalisation of processed wood because these may have currently an advantage in this production (Barbier 1994 p. 105).

If the problem is that the return to the producer does not fully reflect the benefits of

¹³ EU companies in developing countries are also accused of preferring to export raw materials (logs or unprocessed ingredients of pharmaceuticals) because they prefer to process at home. But if the companies are rational, this choice will be because either quality or costs are more favourable in the developed country, unless there are hidden subsidies or incentives from government.

¹⁴ The Austrian attempt to impose obligatory labelling of goods made from tropical timber failed because it was compulsory and because it involved a unilateral decision about acceptable forest management. After challenge under GATT, a voluntary quality mark was substituted (UNCTAD, EPPs, 1995, p. 21).

production, because of either inadequate property laws or failure to allow for environmental benefits (if the carbon sink effect is valid and significant), raising the export price to give the 'right' environmental return would cut off existing demand and current income, discouraging consumption in both export markets and local markets (because the price there would have to match what was available internationally). And raising the price where there is not clear ownership may increase logging in the short run. (Kaimowitz and Angelsen, 1998 p. 91). There may be a role for international encouragement and assistance in dealing directly with these problems, as well as those of the cost of standard-setting and certification. This may be a prerequisite for trade policy to be effective (and may be required to give the appropriate incentives to developed country producers as well).

On the exporter side, various developing countries including Cameroon, the Central African Republic, Cote d'Ivoire, Ghana, and Liberia; Malaysia, Indonesia and the Philippines, and Papua New Guinea (Barbier et al 1994, p. 83) have imposed export taxes or restrictions on logs in order to encourage processing within the country. They were imposed when there was still tariff escalation in the importing countries, and could be justified then as offsetting this. Their continuation could mean that incentives may already have moved towards, if not beyond, the desirable level to encourage efficient and environmentally appropriate location of production. In Indonesia, Barbier (et al 1994 pp. 84-5) found that the inefficiency of local processing was so severe that the use of logs actually increased, against the normal assumption that increased processing will reduce demand for logs.

Wood and wood products suffer disadvantages and need incentives for sustainable production, but the obstacles go well beyond trade barriers.

Non-timber forest products

For these reasons, finding ways of encouraging non-timber forest products (NTFPs), including liberalising the trade in these, may be more effective than direct action on wood and wood products. By raising the return on products with an immediate pay off, they provide an answer to the problem of the long-term nature of forestry without encouraging cutting down trees. Such products include current outputs of trees: rattan and bamboo (particularly important in South Asia); rubber and other gums and resins, for example lac and gum arabic, oils, bark (for some medicinal purposes and also for tanning), nuts, spices (e.g. cardamom grown in forests in India, UNCTAD, EPPs 1995, p. 24), and mushrooms and morels. Other products are used as inputs in medicines and cosmetics and natural dyes. Natural pesticides are derived from some trees. Associated products include honey, wax, and other bee products (important in the Philippines, Brazil and India). Many of these are products likely to be in increasing demand, either as luxuries or because they fit with preferences for environmentally friendly production. Some of these do face high tariffs, and there are fewer possibilities of perverse results from liberalisation than for wood and wood products. Lowering or removing tariffs at a time when demand is starting to turn to these products avoids the creation of alternative, less efficient industries in developed countries.

In the EU, most nuts pay about average tariffs (3-5%), but except for a few of the lowest tariffs, there is no preference for GSP countries. A few also face licencing. On rubber, there remains tariff escalation, with unprocessed forms facing 0 or low tariffs, and products at about 7% (and 3% even for GSP). Most other forest products, including spices, essential oils, dyes, and pesticides, face average (or slightly above average) MFN tariffs, of 4-6%), but are 0 for GSP. The exception is honey, which faces a tariff of 25%, with no GSP

preference. NTBs are not important, except for some sanitary measures. There is scope, therefore, for extending the liberalisation available to the ACP countries to other developing countries, and reducing escalation.

The US has low or 0 tariffs on most nuts, and only a few do not receive GSP preference (including almonds and hazelnuts). Rubber, even rubber products, faces low tariffs, and normally 0 for GSP, as do other forest products, including honey. Japan notifies 'technical standards on all the forest products considered here, which may be obstacles, but has generally low tariffs, and preferences in most other cases. The exceptions are in nuts, where some face tariffs of 15 to 19% (and ginseng, 5% without preference). Canada is restrictive on rubber, with high tariffs for many products, and only a reduction from 8-18% to 4-11% for GSP countries. Other products normally face 0 tariffs, with a few exceptions. There are, however, health and safety regulations for most nuts and many of the other products.

Energy products

Two products are important here: coal because of high tariffs, non-tariff barriers, implicit subsidies, and the highly damaging effects on the environment of producing it; there is potential for transferring its production to developing countries and the environmental benefits in developed countries could be large; ethanol, a bio-alcohol, is being promoted by Brazil as more environmentally friendly than mineral fuels.

The EU has 0 tariffs on *coal*, but imports require a licence (and domestic power industries are *de facto* or *de jure* tightly controlled in their use of imported fuels). The US and Canada have 0 tariffs on coal, and no listed NTBs. Japan has 0 tariffs (except on one product, which is 0 for GSP), but controls imports through quotas and licencing.

The OECD (1998, 2, p. 20) estimated total subsidies to coal at US\$8.1 billion in 1995. The principal damage to the environment came from air pollution, but there were also effects through the over-use of non-renewable resources, and soil pollution (from mines) (OECD, 1998, 2, p. 64). Anderson and McKibbin (1997) calculated that if Europe and Japan removed subsidies and import restrictions on coal, 'that would lower OECD emissions of carbon dioxide by 13 per cent and global CO₂ emissions by 5 per cent.' It is a fuel that is imported by some developing countries, so liberalising it could increase costs for them. Subsidies are estimated by UNEP (UNEP 16 1998) at 80% of the import price in Belgium, 66% in Germany, 42% in the UK and 90% in Japan.

Ethanol (recognised already in UNCTAD 1995 EPPs as 'environmentally preferred') has been suggested by Brazil, which accounts for 46% percent of world production, as a suitable product, in a submission responding directly to the WTO paper on trade and the environment (1997). It is produced mainly from sugar cane; other biomass fuel can be produced from other materials like wood. But it is also subsidised, and it is not clear if it would be economically viable without subsidies. It has always been subsidised in Brazilian production, even before the 1998 fall in oil prices. Therefore, even removing import tariffs and controls might have little effect on its export or production, assuming that WTO rules on export subsidies would apply; Brazil argues that full internalisation of the costs of mineral fuels would raise their prices sufficiently to make ethanol competitive. The Brazil paper quotes tariffs of US \$ 0.17 to 0.33 a litre in 'the main developed countries', sometimes plus additional duties. The UNCTAD data base gives EU rates about 6.6%, or 4.5% under GSP

(Brazil may lose its eligibility to GSP), both well above average. For the US and Canada, UNCTAD shows an applied rate of 10%, above the MFN rate of 5.5-6.5%, but GSP at 0. It is only 3.5% for Japan, and 0 under GSP. Europe has provisions for lower taxes on biofuels than fossil fuels (UNCTAD EPPs 1995 p. 14). Its environmental effects would be different from those of mineral fuels, notably in producing less carbon monoxide (UNCTAD EPPs 1995 p. 13), and it is from renewable sources, but the extension of sugar growing required could compete with forestry goals.

Fish

Fish are a matter for world environmental concern because of fears that the depletion of world fish stocks risks becoming irreversible. Because of the overfishing worries, any trade liberalisation would not be intended to increase financial incentives to produce fish, but rather to reduce incentives to inefficient or environmentally damaging production and to reallocate the incentives. Tuna is important as an import, however, only to the EU (table 3). Some types of fish still pay tariffs, even under GSP, in some developed country markets, but the principal issues are of subsidies, to both home water fishing and distant water fleets. These not only discourage imports from developing countries but encourage over production. The political history of subsidies to fishing is similar to that for agriculture: a combination of concerns for access to food, especially in time of war, and also concern to preserve the supply of trained mariners. These are used to justify support of a declining industry with long-established skills in lobbying.

WTO estimates (1997, p. 26)¹⁵ that pre-Uruguay Round tariffs on fish in developed countries were 6.1 % on all sources and 6.6% weighted by developing country imports. Post-Uruguay Round, it asserts that tariffs averaged 4.5 per cent and 4.8 per cent, and were 10.7% for the EU, 4.1% for Japan and 0.9% for the US. The UNCTAD tariff data also show very high tariffs for the EU, with most fish, fresh or processed, ranging between 12 and 22 % for MFN, and 10% for GSP. The MFN rates can apply even to some developing countries because the EU GSP uses a combination of country and product 'graduation'. A country's exports of a particular product can thus become ineligible for GSP because of a high share of the market or of that country's total exports. The EU recently graduated Thai shrimp and other fish from the GSP to the MFN provisions (raising average tariffs from 9.7% to 14.4% from 1 January 1999). Most also are subject to NTBs, including health regulations, quotas, reference prices, and seasonal controls. Under Lomé, fish enters the EU without tariff for ACP countries (although subject to stringent rules of origin which are themselves a barrier). As the fish tariffs were and remain above the average for all imports, there is significant scope for liberalising, including for GSP countries, but this would be a case of levelling up preferences to give all developing countries the access now available to the ACP.

For the US, there are tariffs only on tuna, and these are reduced to 0 for GSP. There have been some well-known cases of quotas or embargos, but these do not affect most developing countries. As indicated by the WTO, Japan has MFN tariffs of 4.1% on most fish, but 0 under GSP. The exception is 13% for some processed skipjack, and on these even the GSP rate is about 7%. So the problem is much more limited than implied by the WTO. There are, however, technical standards or other regulations on all types of fish which may be *de facto* barriers. Canada has 0 tariffs on most fish, but protects tuna and skipjack, with an MFN rate of 11%, and GSP of 7%. Again, health and safety regulations are important.

¹⁵ These may not be correct because it is relying on a report that did not take account of preference arrangements other than GSP

The EU offered subsidies for modernising fleets in the 1970s and 1980s, and there were also subsidies to take boats out of production. (There were, however, also sales of old boats to new producers, for example by Japan to South Korea and Taiwan; these prevented a reduction in total capacity in the industry, WWF 1998 p. 122). The increase in the number of modern boats, with modern equipment, more than offset any reduction in numbers. EU subsidies are notified to the WTO by the EU, but designed and implemented by each country separately. There are also subsidised credit and fuel schemes, and in France provision for minimum fish prices (UNEP 16 1998, p. 31). There have been agreements to cut the catch, in 1997 and 1998. These are implemented and enforced at national level, and have not been successful. Other non-EU developed countries also have subsidies, notably Norway and Japan, while Canada has provisions for unemployment benefit which effectively discourage fishers from leaving the industry (UNEP 16 1998).

There is disagreement about how fishing is controlled under the WTO Agreement on Subsidies and Countervailing Measures (SCM), adopted in 1994 in the Uruguay Round. The separate arrangements for agriculture (compared to all other goods) were in some ways more permissive, but they were explicitly stated not to apply to fish, and both the WTO (WTO Fish 1998) and the EU (WTO, EU, 1998) accept that the normal SCM rules apply. Under these, for the first time, there was a specific definition of subsidy: direct transfer of funds; forgone government revenues; provision of ‘a good or service to a firm or industry “other than general infrastructure”’, income or price support (UNEP 16 1998 p. 62). There is assumed to be a case of ‘serious prejudice’ if ad valorem subsidisation is greater than 5 per cent. The subsidies to fishing have not, however, been challenged in the disputes procedure, although papers by the US and New Zealand (WTO, US 1997; WTO New Zealand 1997) have complained about them, and the WTO (WTO Fish 1998) has also presented some evidence on those subsidies notified to it (by Belgium, Denmark, Ireland, Portugal, Spain Sweden; Japan; Canada; Norway and Iceland; Poland; South Korea, Senegal, and Tunisia). The notifications only include obvious cases of subsidy, such as to shipbuilding, fuel, or transport, not the more questionable sorts discussed below, and therefore do not reflect the full extent of subsidy. The US is the only country to have taken the view that there is a legal remedy for subsidies; it used countervailing duties on some fish products (for example on Canada in 1986 (UNEP 16 1998 p. 61).

There is also for all countries the question of charging for access to the national waters (the question of access to other countries’ waters is discussed below). In most cases national boats do not pay a charge, and this could also be considered a subsidy (UNEP 16 1998 p. 36) UNEP suggests that this would not meet the SCM definition of a subsidy. It could be considered revenue forgone, but it is argued that this clause seemed intended to apply to taxes not charges (UNEP 16 1998 p. 63). This seems surprising because the equivalent ‘charge’ for mineral natural resources, royalties, is certainly considered a tax. There are also questions about whether governments should charge for provision of infrastructure, for example ports and transport. These, however, are closer to the *de facto* subsidies to any industry; the problem would be if there is differential access for local and foreign boats; this seems to be excluded from the SCM rules. Provision of subsidised inputs would certainly be covered; subsidies to maintain or reduce capacity is less clear.

Table 4: Euro-African Fishing Agreements

Country	Initial Agreement	Latest Agreement
Senegal	1979	1996
Guinea-Bissau	1979	1995
Guinea	1980	1996
Equatorial Guinea	1983	1994
Sao Tome and Principe	1983	199?
Seychelles	1984	1996
Mauritius	1984	1996
Madagascar	1986	1995
Mozambique	1986	?
Mauritania	1987	199?
The Gambia	1987	1996
Angola	1987	1996
Comoros	1988	1994
Gabon	1988	no renewal
Morocco	1988	1995
Cape Verde	1990	1994
Ivory Coast	1990	1994

Source: WWF, *Subsidies and Depletion of World Fisheries: Case Studies*, 1998. Godalming, Surrey: Endangered Seas Campaign, WWF International.

Table 5: EU Fishing Access Subsidies to Tuna Seiner Fleet: 1994-96

Country	C/v	LF/v	TCA	LF/TCA
Ivory Coast	9,966	1,500	11,466	13
Madagascar	9,643	1,500	11,143	13
Cape Verde	14,026	1,500	15,526	10
Equatorial Guinea	2,881	1,000	3,881	26
Sao Tome/Pr	13,500	1,500	15,000	10
Comoros	8,783	1,500	10,283	15
Mauritius	16,250	1,000	17,250	6
Seychelles	53,833	7,500	61,333	12

C/v: Estimated EU compensation per vessel (in ECU)

LF/v: License fee per vessel (in ECU)

TCA: Total cost of access (compensation plus license fee) per vessel (in ECU)

LF/TCA: License fee as a percentage of total cost of access

Source: WWF, *Subsidies and Depletion of World Fisheries: Case Studies*, 1998. Godalming, Surrey: Endangered Seas Campaign, WWF International.

The international agreement on Exclusive Economic Zones, extending the sea area around each country's coast reserved for its fishing to 200 miles, meant that countries or fishers with a history of distant water fishing had to make arrangements with the new 'owners' of the fishing resources. The fact that depletion of local stocks was becoming a problem at the same time meant that the potential restriction on distant fishing came just as

there was a demand to increase it. The international rules allowed countries to set their own conditions for granting licenses to foreign boats. In practice, the EU has negotiated general agreements for its boats to have access to 19 African countries (table 4) subject to limits on the catch, and then in principle charged the boats. Tuna, with shrimp, was probably the most affected; 8 of the 16 agreements with African countries between 1994 and 1996 were entirely or mainly for tuna (WWF 1998 p. 12). In practice, they have not charged their boats the full amount or adequately controlled the catch (UNEP 16 1998, p. 51; WWF 1998, see table 5), although there are now moves to increase charges. (There is also evidence that the fishing is in an uncontrolled manner, catching and discarding immature fish, WWF 1998 p. 20.) This means that there is an effective subsidy from the EU to its fishing boats, as well as unplanned depletion of resources. Again it is not clear whether failure to charge (fully) for this government service to fishing would be actionable under the SCM.

Both the subsidy to European fisheries and the excessive depletion restrict the exports of developing countries. The subsidy not only displaces current exports, it may have inhibited the development of local fishing industries. The US pays a higher rate to the Pacific countries than other countries (10% of the value of the catch, compared to 5% for Japan, 4% for Taiwan, and 2% for Korea, Grynberg 1998 pp 16-17), which may be nearer to the true benefit of the access, but this is apparently partially financed from USAID (Grynberg 1998), which raises questions of the relationship between aid and trade. The EU access fees (estimated at \$229 million annually to Africa, WWF 1998) also go to countries in which the EU and its members have important aid programmes, while Japan has 'carried out [fishery] development projects in countries where Japanese harvesting or processing interests are at stake' (WWF 1998 p. 125). The fact that such agreements are generally between donors and aid recipients suggests that the negotiations are not between equals.

The EEZ laws were intended to give countries control over access to their own waters. Over-exploitation by a foreign country is not inevitable, but lack of physical and technical enforcement capacity, as well as the countries' weak bargaining position relative to major donors, limits their ability to take advantage of the international regime. The EU does earmark some aid funds for building up local capacity to monitor catches. WWF 1998 argues that Mauritania, although partly through its own lack of initiative, pp. 34-5, has found itself relying on the EU access subsidies and foreign exploitation of its fish, while Senegal has used 'its own very strong artisanal sector'. It may be that the countries which have given excessive access to foreign boats in the past would be unwilling to challenge the effective subsidisation of these boats by the foreign government, and uninterested in renegotiating the access agreements, but that there is an international interest in controlling excessive subsidies anywhere to fishing. This could require not only changes in the details of the definition of subsidy under the SCM, but an introduction of a right of third-party countries to bring anti-subsidy complaints. (The argument could, alternatively, be made that allowing excessive exploitation lowers the price of all fish, and therefore damages other exporters, giving them a direct interest.)

Because of the existence of another regulatory regime for use of marine sources, through the Law of the Sea at multilateral level, and also some continental agreements, it will be necessary for any WTO rules to be consistent with these.

Control of subsidies and better regulation of foreign fishing both offer ways of using WTO trade rules to improve the fishing regime. The first step may be to test how far existing rules can be used.

Whether or not it should be considered aid, the payments from access agreements are, for some small countries (particularly in the Pacific and some African countries: 41% for Guinea-Bissau, in 1995, WWF 1998 p. 10), an important source of revenue (Grynberg 1998). Any change would need to ensure not only that a substitute system provided fees and enforcement for fishing by individual boats, but that it provided an equally secure source of revenue. This is an area where donors could have a role, to strengthen local policy making, because both formally and in practice, the question of setting and enforcing catch limits is one for local policy.

Meat

Protection of meat is through high tariffs and CAP restrictions, and the operation of agricultural protection has also led to subsidised exports to third countries, notably by the EU. OECD (1998, 2, p. 15) estimated total subsidies by OECD countries to all agriculture at US\$297 billion in 1996. As beef is covered by the CAP (and, for some ACP countries, is also subject to quota), the quoted tariffs for the EU are not directly relevant, but it may be noted that they range up to 1000%.

Production under these conditions has become highly intensive in its use of land, and inputs such as hormones and other chemical aids to output. There also are problems of disposal of waste products. OECD (1998, 2, p. 56) found that excessive agricultural production damaged the quality of the soil, water, and air, in addition to effects on biodiversity. It did not attempt to quantify the effects from over-exploitation, relative to 'normal' effects or the results of other policies. Production in more suitable countries would therefore be likely to be not only cheaper (a particularly important efficiency gain for poor consumers who spend an above average proportion of incomes on food), but more extensive. This is one of the clearest examples of a potential for an environmental gain from trade liberalisation because different techniques are used by the potential exporters.

Sugar

Sugar is also controlled by the CAP and quotas, with tariffs up to 85%. The other developed countries included here (US, Canada and Japan) also have high tariffs and in most cases also tight NTBs. The US also operates sugar quotas. Like meat, it is among the most protected products in trade.

For sugar, the intensive cultivation, both in the EU and the countries which have received sugar quotas from developed countries, has led to damage to land (and the responsiveness of farmers in these countries to the price incentives suggests that, unlike in forestry, trade liberalisation would have direct effects on reallocating production). There is a risk that increased production in some countries could lead to diversion of land from forestry, so that if the damage from over-exploitation in those countries reducing their production proves not reversible there could be an increase in world environmental damage, but there could alternatively be simply diversion of sugar back to food from subsidised uses like ethanol, rather than increases in production. Reducing protection of these products could benefit income, distribution of income and the environment.

Leather

Like clothing, leather and leather products remain one of the sectors of high tariffs and some escalation. Post Uruguay Round tariffs for developed countries were 7.3%, as the WTO (1997 p. 52) states, twice the average level. It calculates that the escalation on average for Canada, the EU, Japan, and the US goes from 0 for primary products, 4.8 for intermediate, and 12.1% for products. The UNCTAD figures do not agree with this. They do not indicate clear escalation for the EU. Untanned leather, and similar, has tariffs of about 7% (reduced by GSP to 5%), while tanned is about 2-3% (with some types reduced to 2%). Products face varying tariffs, from 4-10%, reduced to 1-6% under GSP. The tariff level is still an important barrier, therefore, but with no clear structure. The US has low rates for leather, usually reduced to 0 under GSP, but rates of up to 20% for some products, with only some products offering preferences. There is, therefore, an escalating structure, as mentioned by the WTO, and a very variable one. Japan, in contrast has the reverse of escalation, with high tariffs (up to 50%, reduced but only to 24% for GSP), but rates of 10-20% for most products (reduced to 5-9% for GSP). Canada has rates of 3-4% for the least processed, rising to 14% for more refined leather materials, and a variable structure from 0-19% for products. GSP gives reductions on most of these, but normally by less than half. Countries therefore face not only high tariffs in leather, but a range of very complex tariffs. Reducing and simplifying tariffs could both be helpful to efficiency (and the differences among the major markets also make producing at an efficient scale for several markets more difficult).

It is an industry where all stages of production have potentially large damaging effects on the environment, but where the initial production of leather is one of the worst. If removing restrictions and escalation does have the effect of encouraging a shift up in the share of higher stages of production in the developing countries, then there could be a reduction in environmental damage. Even if total production of leather remained the same, the share of leather production in the output of developing countries which moved into processing as well would fall, and some intermediate processes (which are, in fact, like textiles relative to clothing, less labour intensive and more technology intensive than making leather products), might shift back to developed countries where their costs might be internalised.

Cocoa, coffee, tea

On these, the barriers are more to the processed versions, giving still-significant tariff escalation. The EU has high tariffs, even allowing for preferences under GSP on coffee and cocoa, of 9-12%, except for completely unprocessed. Some chocolate products are also affected by the sugar controls. The US has tariffs or quotas on some products which contain sugar. Japan has very high tariffs on coffee and cocoa, up to 25-30%, and only slightly lower tariffs, 15-20%, on tea, with only limited concessions under GSP. The tariffs are 0 for completely unprocessed, so that there is very steep escalation. Canada has 0 tariffs on coffee and tea, and most forms of cocoa. Where there are higher tariffs, of 8-10%, these are reduced to 3-5% under GSP. Processing may not be possible in all producing countries, but removing tariffs would allow those who could do it to do so, and there are potential savings also in transport costs.

Other fruits

Encouraging these could encourage sustainable agriculture, as a substitute for annual

crops, and for some (notably citrus) there is also the possibility that production in developing countries, without protection, will be less intensive in resource use than it is in the protecting developed countries. Tropical fruits are also likely to find growing markets. While some fruits face low tariffs in the EU, or receive preferences, most citrus fruits still face exceptionally high tariffs, up to 19%, with in some cases special seasonal provisions and reference prices, all intended to protect producers in southern Europe. There are virtually no concessions under GSP, so that there is considerable scope for liberalisation. (The difficulty of liberalising these in the negotiations with South Africa suggests that liberalisation would be difficult to attain.) The US protects many fruits, including citrus, by high tariffs (up to 26%) or seasonal rules, normally without preferences for those where domestic production competes. Japan also has high protection on most fruits (up to 33%, but around 19% for many), with rare concessions under GSP. The EU's regime for bananas is under review by the WTO. The US and Canada have no tariffs or controls (the remaining US tariffs on processed bananas are removed under GSP). Japan has a tariff of 33%, reduced to 10% under GSP. There are also technical standards and seasonal controls. Canada is the exception here, with 0 tariffs, although there are health and safety regulations.

Cut flowers

Cut flowers face very high European tariffs, normally 15-17%, and for only a few is there a GSP rate; even this is normally 15%. There are additional seasonal controls and surveillance, and flowers from some countries face particularly stringent sanitary controls. The US has lower tariffs, of about 7%, and these are 0 under GSP except for roses. Japan has 0 tariffs. Canada has high tariffs on some flowers produced there, of up to 9-10%. The environmental argument is similar to that for food, but here the use of pesticides is a particular concern in some protected markets.

Cotton, clothing and textiles

The clothing and textile industries have been subject to among the highest tariffs and tightest non-tariff barriers, with detailed discrimination by product and country, so that there is clear potential for liberalisation. For the EU, the tariff structure is still strongly escalating, from 0 for cotton seeds and waste, to 5 % for yarn, 9-10% for cloth , and 12-13% for most clothing. The GSP rates for yarn and cloth are only slightly below these. Although rates are lower for clothing, most of this remains subject to Multi-Fibre Arrangement (MFA) controls, and therefore there is little scope to take advantage of the tariff preferences. EU has always exempted least developed countries, like the ACP, from the MFA. The US tariff structure is less regular, but also rises from 0-2% for the least processed, to 6-9% for most yarns, and over 10% for textiles. Finished products are 10-20%. The industry is excluded from GSP, and extensively subject to the MFA (including least developed). Japan also has an escalating structure from 0 to 8% for yarns, but this is reduced to 0 under GSP, and not subject to MFA. Some textiles are subject to MFA, and most are not included in GSP, with tariffs of 7-10%. Clothing faces high 13-17% MFN tariffs, but unlike in the other importers, is not subject to MFA, and GSP lowers these tariffs to under 10%. Like the US, Canada generally excludes this sector from GSP (there are few exceptions among fabrics). The tariff rises from 0 for unprocessed to 10% for threads and yarn, 14-16% for fabrics, and up to 23% for clothing. All levels of production are potentially subject to MFA. Clothing remains, with temperate agriculture, the most affected industry in trade. The EU could extend the preferences given to the ACP and least developed to all; all could reduce their escalation and NTBs.

The WTO (1997 p. 49) argues that the environmental problems are 'associated with the production of cotton and the finishing of textiles). For cotton, this is because of intensive use of chemicals, particularly in cotton destined for higher quality products, while in textiles it is the discharge of effluents and wastes. But textile production is tending to move back to developed countries because it is capital intensive. Clothing production is less polluting, but it tends to be not only labour intensive, but to bring new workers into the labour force in most developing countries. There are therefore clear development benefits additional to the normal efficiency and processing effects from removing controls and liberalising tariffs, but a study would be needed to determine the environmental gains.

Natural fibres: jute and kenaf

These are argued to be more environmentally friendly over their life-cycle than the polypropylene products which are their substitutes (UNCTAD EPPs, 1995). The constraints on using them, however, may be more in failure to internalise the costs of the substitutes and in technical weaknesses than in barriers to jute, so that trade liberalisation may not be a complete solution. Jute faces tariffs in the EU on all but the most completely unprocessed, and there is escalation from 4% to 6%, from yarn to fabrics, even allowing for preference under GSP. US MFN tariffs are 0 or negligible, and 0 under GSP. Japan has 0 tariffs on unprocessed jute, rising to 7 % for yarn and 17% for fabrics, but these are 0 under GSP. They are, however, subject to import authorisation. Canada in contrast has 0 tariffs only on unprocessed products with 9 % on semi-processed, and up to 16% for more processed, reduced to 5 or 9% under GSP. They are likely to become more important for countries like Bangladesh which will lose its relatively privileged position (as a least developed country) in clothing exports when the MFA ends.

Non-ferrous metals

The EU still has high tariffs on aluminium, copper, except unprocessed, and some lead, of 4-6%, with reductions, but not to 0 for GSP. There is escalation, but only for copper. The US and Japan also have MFN tariffs of 4-6% on copper and aluminium, and on other non-ferrous metals, but these are reduced to 0 under GSP. Canada has escalating tariffs from 0 to 9% in aluminium, reduced to 0-5% for GSP. For most other metals, the MFN rates are low and the GSP rates are 0-1, but there are occasional peaks of 8-10, giving GSP of 4%, especially in the precious metals.

Subsidies to energy may be a more important influence on location. These industries tend to move the processing stage to developed countries, with efficiency and environmental costs. OECD (1998, 2, p. 64) found that 'primary aluminium manufacturers...have been found to cluster around government supported energy sources'. Removing subsidies to energy and easing import of recycled goods could both increase recycling and help developing countries. There would be environmental damage in the developing country, but less than from current production in developed countries.

Environmental goods

Liberalising trade in goods which actually protect or clean the environment is obviously desirable, but identifying and agreeing on a list has proved difficult. There are problems both of identifying which products fall clearly in this category and of finding appropriate tariff lines to fit them. Most are not produced in developing countries, however,

and for some there is little trade in total. Trade liberalisation is, therefore, unlikely to have an important impact in the context of this study (as we do not include liberalisation by developing countries) and there is unlikely to be opposition to their liberalisation, so it is not necessary to make the case. Liberalising trade could increase the efficiency of their production in developed countries, and therefore lead to lower costs for developing countries importing them. They are conventionally defined to include: electric vehicles, air and water filtering equipment, catalytic convertors, CFC substitutes, bio-degradable plastics, lead-free petrol, nontoxic paints, equipment for solar and wind energy; sewage equipment, and semiconductors. Producing semiconductors, however, is an important polluting process. On those goods which the UNCTAD tariff data base can identify: the EU, the US, and Japan have low tariffs, 3%, and 0 under GSP. Canada, however still has high tariffs on goods like catalytic convertors and filters (7%), although reduced to 2% and 0, respectively, under GSP.

The international context

Any initiatives in bringing environmental criteria and objectives into trade liberalisation and negotiations must not only take into account national policy objectives, but fit into three different strands in international negotiations:

- the rules and conventions of the WTO;
- other environmental regulations and negotiations; and
- the growing interest in international standards for property rights.

WTO rules

WTO rules and WTO negotiations impose constraints on the types of good and country which can be specified for special treatment. Discrimination must be by type of good, for example, not by purpose, so that a general category of 'environmental goods' would need clear definition and listing. The EU GSP scheme has introduced the possibility of discrimination by environmental criteria; this did not need prior WTO approval (GSP schemes are unilateral offers). It has not yet been applied, and there has therefore been no possibility of challenging it and testing it in the dispute procedure. (The EU special GSP concessions for Andean drug producers have, however, recently been challenged in late 1998.) Both the industrial and agricultural GSPs, from 1 January 1998, offer additional preferences for countries meeting minimum environmental standards as well as for countries complying with certain ILO conventions. The environment conditions are defined as local legislation incorporating the Tropical Woods Conventions. The country must apply to the EC, and show adequate enforcement mechanisms as well as legislation. No country has yet done so, and therefore it is not clear how the EC will judge compliance. The method used to increase preferences is to apply an additional preference margin for the appropriate forestry products. The effect is to double the preferences at the two most sensitive levels (from 15% to 30% and from 30% to 60%), while reducing the tariff at the least sensitive to 0.

The WTO's criterion of specifying products has been held to forbid discrimination by process (US restrictions on fishing practices were found contrary to the rules in a Dispute), but it is not clear that it will be permanently excluded. The WTO has been able to expand its coverage from goods to services to intellectual property, potentially to investment; there seems no reason legally to stop it from defining goods by process. (And certainly there is no objection in economic theory which recognises any difference which consumers perceive to

be a difference.) The services agreement already moves in this direction. It should be noted that 'Environmental Services' are a category in the General Agreement on Trade in Services, GATS, classification. This means services to do specific things for the environment (WTO, 1999) (sewage, refuse disposal, etc.), not services produced or operated in environmentally friendly ways, exactly what 'environmental goods' is used to mean. The classification by purpose is in fact general in the GATS (communication, tourism, etc.) suggesting that this criterion is neither impossible to operate nor irreconcilable with WTO principles. There would probably be serious difficulty in securing international agreement on processes, but this is equally true for most of the products proposed here. The easy trade agreements have been achieved in previous Rounds.

The subsidy rules may provide opportunities to deal with some types of intervention directly as was discussed in the section on fish. But they also constrain any proposals to offer subsidies for good environmental practices.

An important strand in GATT and WTO negotiations has been the continuing conflict between targeting preferences (by level of development, region, associated countries, etc.) and moving towards a common multilateral regime. Each move in one direction seems countered (the Uruguay Round restricted regions and reduced the scope for countries to choose not to accept certain 'protocols' of the GATT; immediately after, the Director General proposed a special regime for least developed countries). Broadening any liberalisation proposed, to developed countries as well as developing, or to all developing from the least developed, would not reduce the environmental benefits (and could increase them) but might restrict the income and structural effects on developing countries.

Environmental conventions

There are some environmental conventions already in existence which constrain types of production in developing as well as developed countries, and the climate of international concern suggests that more will come. Some deal with problems where the actions of a country can affect the world (CFCs, for example), but there may now be a move into subjects where international regulation is because of a common concern, not earth-wide self-interest (analogous to concern about human rights). The principle of regulating the effect of production on the environment, but permitting different regulations and implementation, which are consistent with local conditions and sufficient to produce the required outcome, may need to be developed and clarified. Of the international conventions, two clearly deal with problems of international effects: the Montreal Protocol (adopted 1989) which covers CFCs and the Basel convention, 1992, on hazardous wastes. CITES, on endangered species, has a combination of interests; there are some global interests in conservation, but empirically it recognises different degrees of 'endangeredness' in different countries (the controversy over ivory).

Some environmental agreements contain provisions for the use of quotas or prohibition of trade in specific products. These have not yet brought formal conflict with WTO rules, and the UNEP sees them as different in kind from 'trade measures' because their primary purpose is not to regulate trade (UNEP 1998). This attempted distinction illustrates the difficulty of dealing with different objectives. The measures are 'trade measures' in that they affect trade (and sometimes, in that they have protectionist as well as environmental motives). The international system needs to find a way of reconciling regulation by purpose with regulation of specific measures, and it is difficult to see how this can be done as long as

the organisations involved have no overarching goals or government.

When the GATS was adopted, there was concern that it might conflict with measures to protect the environment. The Committee on Trade and Environment was asked to report on this, but has not yet found a conflict (WTO, 1999, p. 25)

The questions of forestry and fishing are likely to be on the international agenda, with similar problems of defining the extent, and the limits, of international interest. The Kyoto (1997) and Buenos Aires (1998) conferences raised the possibility of allowing emissions trading and of relying on forests as 'sinks'. Any WTO agreement on trade in forest products would be negotiated as negotiations on these environmental questions are also proceeding. Direct subsidies or payments for forests could meet some of the difficulties identified here. The Kyoto agreement had a trade element, of encouraging the export of emission-reducing technology to developing countries.

In December 1998, the Cape Town Declaration established a common interest in marine protection among sub-Saharan countries. The problems of excessive fishing are under discussion also in the FAO. Action to control over-fishing by non-trade bodies could pre-empt WTO action on subsidies.

The World Bank has announced a 'carbon investment fund' specifically for Eastern Europe, to provide small subsidies where the environmental benefit from a project could make the difference between achieving and not achieving the necessary return (Stuart, Moura-Costa, 1998), and its 1999 World Development Report may also propose subsidies. These would need to be reconciled with WTO rules, but offer an approach to encouraging internalising environmental benefits. Environment questions (along with investment and labour) are putting pressure on the different, functional, multilateral institutions to coordinate and prioritise their objectives and their members' obligations.

Property rights

The first involvement of the WTO in property rights was the inclusion of intellectual property in the Uruguay Round. This affected some trade directly through bringing countries' patent regimes into international standards. It has reinforced the traditional interaction between patent and copyright law and trade: the right to refuse to import counterfeit or other goods which do not conform to international agreements, now extended by international agreement on enforcement. But initiatives since then indicate that some see a much larger role for the WTO (or some other international institution) in defining international standards for a broader range of property rights. Proposals for an international agreement on investment include definitions of investors' rights, and discussions of possible rules on business regulation or competition policy could raise similar questions. This could lead to a suggestion of setting international standards for companies' or communities' 'property' in the environmental consequences of production. In this report, it has been assumed that countries require and regulate 'internalisation' in accordance with their own conditions and preferences. This may cease to be internationally acceptable in an atmosphere of international awareness and concern about environmental risks. If international agreement on environmental standards was reached within the WTO or other organisation, this could provide a means of discriminating in favour of more environmentally benign goods (or against those damaging to the environment), helping liberalisation that was 'environmentally efficient'. But it could restrict countries' ability to choose lower standards or more limited

internalisation.

An alternative voluntary response would be to extend the scope of the ideas of labelling and certification which are developing in forestry¹⁶. Other types of production could develop standards, seek international recognition, and try to secure advantage from this. This is unlikely to be successful for more than a few products, partly because the nature of production differs so much among countries, but also because wood and deforestation have been early environmental concerns; this gives consumer awareness. A variety of labels for too many products would not have this advantage.

A more radical innovation would be to have international requirements, not about property rights themselves, but about how decisions about property rights are made, including rules on management of common property (eg. forests or fish) and what was required in terms of internalisation of full production costs (e.g. damage to land through over-exploitation). Under such a regime, provided the decisions had been made in accordance with internationally agreed principles of governance or democracy, goods could be given preferential treatment (or not subjected to discriminatory treatment) in trade. This could be more sensitive to national conditions and preferences than a single, internationally agreed, convention on property rights, but, as well as obvious difficulties of defining what is 'acceptable', it fails to deal with effects external to a country, and it could not exist without an overriding international regime to avoid (or manage) damage to others. Much of the system built up through the GATT and WTO is of course based on this concern for damage to others. Tariffs are 'acceptable' under the WTO, but only if within levels agreed, and applied in consistent ways; could the CAP or subsidies to fish be 'acceptable' because they are derived from democratic processes? The growth of international regulation and perception of international interest has gone too far in the last 50 years for a simple rule that internal processes must always be respected by the international community to hold.

Reconciling the trade regime to a property-based regime will, like making it compatible with the environmental approach, require ways of balancing not just different interests, but different types of interest. The difficulties of including intellectual property in the WTO are a first example.

The international system may go in the direction of internationalising standards (as the EU has done on a regional basis). This would produce a definition of 'environmental benefit' much stronger than is used here, if we can assume a world standard for judging environmental costs and, implicitly, internationally consistent rules for internalising them. Although complex in some ways, because it could lead to discrimination by origin of products, it could ultimately lead to a more common regime for production. Developing countries would lose flexibility in standards, but would gain assured access under common rules. They would also have the potential reduction in adjustment costs of being able to adopt the international standards as their first standards. (Catching up arguments may apply to standards as well as to industrialisation.) Aiming for this type of approach could provide a framework for developing negotiating positions.

¹⁶ Malaysia (WTI/CTE/M/16, 1997) stressed in the CTE discussions that adopting any standards, ISO or others, would require discussion, and agreement by developing countries.

Towards recommendations

The discussion of individual products and the outcomes of liberalising provides a menu of possible measures, some specific and some cross-sectoral. What this paper has tried to do is identify how to analyse environmental impacts, and suggest some products where the effects may be large. This suggests two related next steps. First, in a WTO context, it is for countries to 'demand' liberalisation in goods where they have an interest, and this paper suggests products to be followed up by countries which know themselves able to produce them. Pointing out the extra, environmental costs of inefficient products may alter the balance of negotiating positions between 'demandeurs' and those protecting their home sectors, but it is only a shift in the balance; all the existing interests in protection remain. Second, going beyond the rough sectoral classification here to identify individual products, processes and potential gainers and losers in trade could be done through sectoral studies of production conditions and potential.

For some products, means may already exist to liberalise trade and improve the environment: using the WTO provisions against subsidies could limit current over-fishing, and redistribute fishing income to the developing countries. For agricultural products, the subsidy rules cannot yet be used, but could be strengthened in a new round, and very high tariffs are a target for negotiation. Tariffs are also high on clothing and textiles and some leather goods. Energy subsidies may be limiting access, at least for coal; they may also be distorting production patterns for some metal products. For all these, trade liberalisation (taken broadly, to include action on subsidies) could produce significant results. For some goods, while there would not be major effects on development, effects could be important for particular industries. In non-timber forest products, there is potential for trade liberalisation perhaps as part of a broader forestry programme. Other goods are likely to need a broader approach. In forestry, this could come in part from other environmental initiatives (subsidies for carbon sinks, etc.), but it may need direct action to promote forests. The questions raised are not different from those found in developed countries: in all countries, forestry may require a special regime, permitting subsidies, to recognise the long-term nature of the investment as well as to internalise the potential environmental benefits. For jute, a solution may need to come from changes in regulations of competing industries, which could come from a more rigorous approach to internalising environmental costs in developed countries.

Both 'trade measures' and 'environmental measures' thus need to be seen in the context of other policies. What is important is to ensure that all the effects of a trade measure are taken in to account.

There are also some general issues that cut across the products:

Action by WTO and UNCTAD: In 1997, individual Least developed countries were offered detailed analysis of their trade and trade policy needs, as part of the initiative introduced at the Singapore ministerial WTO meeting and promoted at a High Level meeting; this could be extended to environmental effects.

If subsidies are to be a major focus of trade negotiations in future Rounds, an international data base is needed, using common definitions and eventually standard methods of quantification. This need not be (at the start) based on agreed, legal definitions. The current UNCTAD system for recording and quantifying Non-Tariff barriers developed out of independent attempts, and has been a useful compilation even for those who disagreed with

the definitions.¹⁷ The WTO is now making a similar initiative on services. Subsidies may seem intractable, but are no more so than NTBs or services.¹⁸ OECD (1998, 1) introduced ‘a classification of support measures’ (pp. 20-25) ‘according to the conditions on which they are used and their immediate effects on government budgets’. This would need re-basing to be by sector, but could be a start.

Transition costs: Because of the progress in 50 years of reductions in tariffs, the major effects are likely to come from removal of subsidies. Two possibilities here are food and fish. The most likely form of developed country liberalisation would be extension of discriminatory privileges to all developing countries (as was done for least developed). Both types of liberalisation have potentially harmful effects on previously preferred countries, raising prices, reducing revenues, and ‘undiversion’ of trade away from them. While the WTO, rightly, has no provision for compensation for losses from multilateral liberalisation which reduces discrimination, it would be appropriate for a donor to consider offering compensation for transition costs and assistance in adjustment. (This would also be consistent with at least the purpose, if not the result, of internal subsidies to move farmers and fishers into new industries.) In the long run, higher world income and possible economies from more efficient scale and location of production, should provide a permanent compensation for what is called here ‘undiversion’.

Administrative requirements: Ensuring that shifts in production do produce environmental gains depends on the assumption that developing countries can enforce internalisation of what they perceive to be costs. But enforcing fishing access restrictions, licensing, and payments; certifying environmentally acceptable processes, in forestry and other production; becoming aware of, meeting, and enforcing international standards: all these are costly in administrative resources and in trained personnel. They are obvious areas for assistance and there are many more specific areas of assistance, for example in providing the different equipment needed to cut small poles rather than large which would permit a transition to more sustainable forestry.

Legal requirements: designing and enforcing appropriate property and internalisation regulation are areas where both developed and more advanced developing countries have more experience than the least developed. One possible avenue is technical assistance. But there may be a case also for negotiating initiatives. It may be that international standards in intellectual property regulation and in other areas of economic legislation in regions like the EU, NAFTA, and MERCOSUR will be followed by much more extensive use of internationally harmonised legislation in other subjects. If so, smaller countries could find it an advantage to seek to get international norms agreed as soon as possible so that they can move directly to these, avoiding the transition costs which other countries will face.

Semi-legal requirements: labelling and certification will be popular solutions with developed countries in the immediate future. Only if there is some international monitoring (whether through ISO or other agency) will they have credibility. UNIDO, for example, has

¹⁷ It is, however, in urgent need of updating.

¹⁸ Or even than tariffs: there is no economically rational way of averaging tariffs: high tariffs deter trade, so weighted averages are misleading; simple averages ignore real differences in weight.; using indirect measures like price differentials is fraught with difficulties; distinguishing tariffs from other taxes or fees is an art, not a science.

proposed a 'Pan-African Federation of Wood Industries Associations', to liaise with donors on regional standards and training. These are costly in money and expertise and could be assisted by donors.

Infrastructure costs of processing: one of the problems frequently mentioned for lower efficiency of processing in developing countries is poor transport (roads too rough to transport veneers; lack of refrigerated transport and storage for fruits or chocolate). Just as infrastructure has been one of the most popular areas of subsidy in domestic fishing, it may be an effective area for assistance (particularly as it is entirely exempt from the WTO's rules on subsidies).

Technology transfer: to gain the extra advantages of better processes as well as the locational advantages of moving production to the more appropriate country may require specific assistance in technology. The proposals in the Kyoto conference for helping developing countries with emission-reducing technology have failed because they relied on private international investment, and in many of the sectors and countries discussed here, international investment is unlikely. There is therefore a gap to be filled by assistance.

Trade liberalisation, particularly if it includes removal of subsidies, could be an important stimulus to more environmental efficiency in some products, and may be a condition for progress in others. It will not be a complete solution. It needs to be accompanied by measures to correct transitional and other unintended effects, and by initiatives specifically targeted at environmental problems, and it will not be the only (or the main) motive driving trade negotiations. But environmental arguments could be a stimulus to make advances on trade liberalisation which have been unable to secure sufficient support for economic motives alone. Making initiatives which are compatible with both the trade liberalisation and the environmental agendas is the fundamental objective.

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