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The Entwining of Trade and Policy in Environmental Issues: Implications for APEC*

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SUMMARY

Following a lull in interest brought on by the economic disruptions of the 1973-82 oil-shock period, widespread public interest in environmental issues is becoming much more intense, more

widespread, and is likely to be sustained and to affect a much broader range of countries than was the case in the late 1960s/early 1970s, and not least through its effects on foreign trade and investment.

The foreign trade and investment issues raised at that earlier time were centred on how the imposition of stricter pollution standards at home than abroad might damage international competitiveness and how to avoid such damage through border protection measures. These responses were then, and still are, of legitimate international concern, especially on the part of newly industrializing countries. Added to this is the concern that environmentalism, like certain approaches to regionalism, might pose a threat to the liberal multilateral trading system -- on which the future of small open economies and Asian-Pacific dynamism generally continues heavily to depend.

This paper addresses four different but inter-related sets of questions. First, in what ways and why are environmental issues having a more pervasive influence on public policy and how, in particular, are they relevant to international trade? Second, how is this relatively greater priority being given to environmental issues likely to affect global trading patterns over time? Third, what impact will new trade liberalization initiatives have on the environment? And fourth, what are the implications for countries in the Asian-Pacific region, and how might they best respond, including in the context of APEC?

The paper concludes that it would be opportune for APEC countries to seek jointly to have some influence in developments in the GATT/World Trade Organisation's Committee on Trade and Environment. It also suggests that greater dialogue on this issue among APEC countries could serve to limit the potential scope for environment-related trade friction in the region. It is especially important for APEC countries to offset the considerable risk that trade-related policies adopted in response to environmental concerns will not only be so far from first-best as to worsen welfare in many countries through eroding the global trading system, but may even add to, rather than reduce, environmental degradation

THE ENTWINING OF TRADE POLICY AND ENVIRONMENTAL ISSUES: IMPLICATIONS FOR APEC

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Widespread public interest in environmental issues first surfaced in Western countries in the late 1960s/early 1970s. At that time concern focused mainly on industrial pollution within and between neighbouring advanced economies. The foreign trade and investment issues raised at that time were centred on how the imposition of stricter pollution standards at home than abroad might damage international competitiveness and how to avoid such damage through border protection measures.

Following a lull in interest brought on by the economic disruptions of the 1973-82 oil-shock period, the current wave of public concern for the natural environment, leading up to and following the United Nations Conference on Environment and Development held in Brazil in June 1992, is much more intense, more widespread, and likely to be sustained and to affect a much broader range of countries than was the case in the 1970s -- and not least through its impact on foreign trade and investment.

This phenomenon is worthy of the attention of those concerned with economic growth in the Asian-Pacific countries not only because environmentalism has already become a non-trivial influence on public policy in these economies but also because, like certain approaches to regionalism, certain

environmental policies pose a potential threat to the liberal multilateral trading system -- on which the continued dynamism of the Asian-Pacific region continues so heavily to depend.

This paper seeks to address four different but inter-related sets of questions. First, in what ways and why are environmental issues having a more pervasive influence on public policy and how, in particular, are they relevant to international trade? Second, how is this relatively greater priority being given to environmental issues likely to affect global trading patterns over time? Third, what impact might new trade liberalization initiatives have on the environment? And fourth, what are the policy implications for Asian-Pacific countries, and how might they best respond?

While the greening of world politics has the potential to boost Asian-Pacific and global welfare broadly defined (although the gains will not necessarily be spread evenly and some communities could potentially be made worse off), the paper concludes that there is a considerable risk that trade-related policies adopted in response to environmental concerns will be so far from first-best as to worsen welfare in many countries by eroding the global trading system. And in the process they may even add to, rather than reduce, environmental degradation. Hence the urgency not only to pay attention to but also to influence the evolution of trade and environment policy.

1. Why environmental issues are becoming more pervasive

The list of environmental concerns has grown rapidly in recent years, and has taken on a more global orientation. Air, water, soil and visual pollution at the local or national level is increasingly seen as emanating from the production, consumption or disposal not only of industrial goods but also primary and service sector products. Some of that pollution is believed to be also damaging the environment on a global scale, for example, through ozone depletion and climate change. Hence people are worried by certain production and process methods, for example, the use of CFCs and the emission of CO2. Their worries apply not just at home but also abroad, particularly as economic growth takes off in newly industrialising countries with laxer environmental standards. Likewise, more and more people are concerned about resource depletion issues such as deforestation, species extinction and animal rights at the global level, regardless of national boundaries. And ongoing integration of the world economy brings with it new concerns by consumers about the safety of imported products. Since personal values play an important role in international debate on these issues, the scope for friction between countries is considerable.

Fluctuate though it might with the business cycle, this heightened concern for the environment and for product safety is likely to keep growing. One reason is that, even though uncertainties remain, the scientific basis for many of these concerns is perceived to be more solid now than was the case twenty years ago. Another is that both the world's population and real per capita income continue to increase at very high rates by historical standards. Both population and income have increased by about 40 per cent since 1970, and the annual volume of aggregate output and consumption has doubled in that period. In the absence of policy intervention, these increases will add continually to the demand for environmental resources. These include essentials for human health such as clean air, potable water, filtered sunlight and natural medicines; raw materials available from mining, hunting and gathering, logging and fishing; and the capacity of the eco-system to absorb wastes and to generate aesthetic and recreational services such as those obtained from unspoilt wilderness areas with a diverse abundance of plant and animal species.

Unfortunately, the supply of many of these environmental goods and services is not unlimited, and markets for many of them are incomplete or absent. Markets are under-developed because of disputed, ambiguous or non-existent property rights, or because of the high cost of enforcing those rights.

It is true that the more advanced economies tend to have established institutional structures to help handle the tasks of arriving at a social consensus on what are appropriate environmental or sustainable development policies for that society, of allocating property rights, and of enforcing policies. The same is true in some traditional societies before they begin to 'modernize' and their resource stocks come under pressure because of declining mortality rates. But the creation of appropriate new institutions to determine and implement sustainable development policies is often slow in the newly 'modernizing' economies, where population and consumption growth are expected to be concentrated for the foreseeable future. And, at the international level, cooperative intergovernmental mechanisms in the environmental area are still no more than nascent. Hence the growing interest especially in the more advanced economies -including on the part of proposers and drafters of international environmental agreements - in using one of the few policy instruments apparently available to them, namely trade restrictions, to influence environmental outcomes in other countries.

Already we have seen the use of discriminatory trade restrictions affecting particular targeted products (for example, in the Montreal Protocol on Substances (CFCs) that Deplete the Ozone Layer). There have also been proposals to use trade sanctions against unrelated products. These aim chiefly at persuading developing countries to adopt stricter environmental standards (for example, threats to provide less open access to textile and other markets in industrial countries, unless logging is curtailed or managed on a more sustainable basis).

2. The relationship between economic growth, environment, trade and welfare

The standard theory of changing comparative advantages in a growing world economy, which has been developed without consideration of environmental concerns, can readily be modified to incorporate at least some of those concerns. As espoused by Krueger (1977) and Leamer (1987), this theory suggests that when a developing country opens up to international trade, its exports initially will be specialized in primary products. This is because its stocks of man-made capital relative to natural resources are comparatively low. Should those non-natural capital stocks per worker (including human skills) expand more for this country than globally, the country's comparative advantage will gradually shift from the extraction of raw materials (minerals, timber from natural forests) to more capital- and skill-intensive activities (particularly manufactures and services) -- except in relatively land-abundant countries where produced capital and new capital-intensive technologies may continue to be employed profitably to extract minerals or farm the land.

As East Asian experience has shown, this shift will begin at an earlier stage of economic development, and the non-primary exports will tend to be more intensive in the use of unskilled labour, the more natural resource-poor or densely populated the country. In the case of manufactures, this process then leaves room in international markets for later-industrializing countries (for example, Thailand and China recently and Vietnam prospectively) to follow suit in exporting their way to higher incomes.

With the help of the Leamer triangle depicted in Figure 1, that theory can provide a rough idea of different countries' comparative advantage as of 1991. The triangle illustrates countries' relative endowments of three factors, denoted N for natural resources, L for labour time and C for man-made capital (human, physical, knowledge, etc.). Proxies used here to represent the natural resources to labour ratio and the capital to labour ratio are land area per capita and gross domestic product per capita. These ratios are measured in log terms along the NL and LC sides of the triangle, respectively, the mid-point of each being the world average which is taken as the numeraire. Thus point W represents the global average endowment of all three factors. Countries located in space WAN - which includes Africa and Latin America - have below (above) average per worker endowments of produced capital (natural resources), and so would have strong international

competitiveness in primary products and lack competitiveness in skill-intensive manufactures and services, and conversely for Western Europe and Japan which are located in the WBC space.

If national boundaries were such that there were no international environmental spillovers, this story need be complicated only slightly to incorporate non-marketed environmental resources (part of the stock of natural resources) and pollution by- products. The complication required is simply to allow for the fact that as the country's per capita income and industrial output grow, the value its citizens place on the environment increases and with it their demands for proper valuation of environmental resources and for the implementation of costly domestic pollution abatement policies -- at least after certain threshold levels of income and/or pollution are reached. Beyond those threshold points the severity of such abatement policies is likely to be positively correlated with per capita income (as depicted in Figure 2), with population density, and with the degree of urbanization.

If all economies were growing equally rapidly, the progressive introduction of national environmental taxes and regulations would tend to cause pollution- intensive production processes to gradually relocate from wealthier and/or more densely populated countries to developing and/or more sparsely populated countries. They would also slow or reverse the growth in the quantity demanded of products whose consumption is pollutive, and more so in wealthier and/or most densely populated countries where taxes on such products would tend to be highest. If more- advanced economies are net importers (net exporters) of products whose production (consumption) is pollutive, these countries' optimal environmental policies would worsen their terms of trade to the benefit of poorer economies, and vice versa (Siebert et al. 1980; Anderson 1992a). In terms of Figure 1, the closer countries are located to point N and the further away they are from point C in the Leamer triangle, the stronger will tend to be their international competitiveness in goods and services whose production is pollutive or otherwise intensive in the use of the natural environment, ceteris paribus. Thus even countries without (or with unchanged) environmental policies will be affected through trade and investment by the development of environmental policies in other countries.

The story becomes more complicated, however, when account is taken of policy reactions to international environmental problems such as the global commons, species depletion or animal rights. The ban on ivory trade under the Convention on International Trade in Endangered Species (CITES) provides an extreme example: the strong comparative advantage that southern African nations had in elephant products virtually disappeared when the ban was introduced in 1989. And the recent ban, adopted under the Basel Convention on Hazardous Waste on exports of so-called hazardous recyclables from OECD to non-OECD countries, threatens loss of international competitiveness for recycling industries in developing countries, especially in Asia.

Another example is the proposed limitation on imports into some high-income countries of tropical hardwoods, the aim of which is to discourage deforestation. An import ban of this kind would reduce export growth and specialization in logs and perhaps sawn timber in those developing countries still well endowed with hardwood forests (while improving the terms of trade of other net importers of hardwood such as Japan, Korea and Taiwan). And as mentioned above, the Montreal Protocol on phasing out the use of CFCs and halons incorporates discriminatory trade provisions, designed to limit the relocation from signatory to non-signatory countries of industries producing or using CFCs, as well as encouraging non-signatories to accede to the Protocol. And there is the infamous example of the United States ban on the importation of Mexican tuna which US authorities deem to have been caught in dolphin-unfriendly nets. If implemented alone, domestic US regulations affecting the use of dolphin-unfriendly nets on US registered fishing vessels would have boosted Mexican competitiveness in tuna fishing, but the subsequent ban on tuna imports instead reduced it.

As in the latter two examples especially, the motive for trade policy action is often a mixture of national competitiveness concerns and concerns especially in wealthier countries (typically not shared to the same extent by developing countries) for the global commons and for animal welfare. The potential conflict of interest between the two groups of countries, and the fact that discriminatory trade measures are increasingly being used to achieve the first group's environmental objectives, without regard to global development concerns, increase the likelihood of environment-related trade disputes. And these are but minor examples of a large and rapidly growing number of international environmental issues on which countries will have different views.

This increasing use of discriminatory trade measures to address environmental issues should concern the world at large, and dynamic Asian economies in particular, for at least three reasons.

First, trade policy measures typically will not be the first-best instruments for achieving environmental objectives. This is because trade sanctions or the threat of trade sanctions do not directly affect the root cause of the environmental problem and may not therefore be the most effective policy instrument. Their use in place of more- efficient instruments reduces unnecessarily the level and growth of global economic welfare as conventionally measured, and may even add to rather than reduce global environmental degradation.

The second reason is that producer interest groups and some environmental groups are nevertheless finding it mutually advantageous to use environmental arguments in support of their claims for unilateral import restrictions, particularly following the costly imposition of stricter environmental standards on domestic producers. In this sense, the environment can provide a convenient excuse for raising trade barriers that reduce real incomes elsewhere, especially in developing and natural resource-abundant countries.

And third, in so far as this can lead to an escalation in trade disputes -- as is almost inevitable, especially given the North-South dimension involved -- it could be followed by retaliatory and counter-retaliatory action, the end result of which would be an undermining of the open global trading system on which Asian-Pacific dynamism continues to depend.

But there is also another important sense in which environmentalism is putting at risk the global trading system. It is closely related to the second concern mentioned above, and has to do with the claim by some environmental groups that liberalization of trade itself will harm the environment. It is to that which we now turn.

3. Effects of trade liberalization on the environment

The actual trading patterns of countries have been affected not only by their relative endowments of resources as discussed above but also by the pattern of distortionary policies introduced by national governments. A distinctive feature of that global pattern of distortions is that developing countries have tended to discriminate against their primary and labour-intensive export manufacturing sectors in which they are competitive and to favour their import-competing industrial sector, while in advanced economies those industries losing competitiveness that are significant employers (agriculture, coal mining, textiles, cars) are the ones assisted most, especially via protection from import competition.

Economic policy reform, and particularly trade liberalization, would lead to (a) higher incomes in both sets of countries and (b) international relocation of production and consumption. Both of these effects worry some environmental groups. With respect to higher incomes, it is sometimes simply assumed that there will be greater demands on the environment due to increased spending. It is certainly true that per capita demands for raw materials and for the waste absorptive capacity of the

natural environment will be greater with higher incomes, ceteris paribus. But account also needs to be taken of the fact that income growth brings with it at least three pertinent changes in behaviour patterns.

The first one, already alluded to above, is that as economies open up and incomes rise, more stringent environmental policies are put in place. This is partly because the demand for such policies has a high income elasticity after middle-income status has been attained. At the same time, more resources are available to spend on improving the environment. As well, the political cost of supplying such policies falls with the opening up of the economy to trade and investment. It falls because liberalization expands the opportunities to acquire more environmentally benign production processes and consumer products and thereby lowers the cost of (and hence the opposition to) implementing stricter standards.

Secondly, higher incomes in developing countries lead in time to lower population growth rates: currently populations in industrial countries are growing at 0.5 per cent, less than a third the rate in developing countries. This, along with the increased employment opportunities resulting from trade liberalization, is likely to have a major effect in reducing the rate of environmental degradation due to population pressures in developing countries. In rural areas it means fewer people denuding hillsides to eke out a subsistence income, while in urban areas it means fewer un- or under-employed squatters in shanty towns with poor sanitation and water (World Bank 1992).

And thirdly, the increase in the value of poor people's time in developing countries will raise the relative price of wood and charcoal as sources of household fuel. Since almost four fifths (78%) of the timber harvested in developing countries is used as household fuel (World Resources Institute 1994, Table 19.3), this alone could have a major beneficial impact in reducing deforestation and CO2 levels.

Environmental groups may be disappointed that governments adopt less- stringent environmental standards and charges than they would like; but the appropriate response in most circumstances is for them to advocate tougher domestic environmental standards in their own and other countries as incomes rise, rather than to argue against those income rises through trade liberalization. The main exceptional circumstance is when the environmental effects of greater spending spill over national boundaries. The spillovers could be physical, as with carbon emissions and large-scale deforestation (climate change, reduced biodiversity) and CFCs and halons (ozone depletion). Or the spillovers could be (for want of a better word) psychological, as with global concerns for plant or animal rights.

One possible solution when there are international spillovers is to seek international environmental agreements (for example, the Montreal Protocol on CFCs, the Basel Convention on Hazardous Waste or the Climate Change Convention). But such agreements typically are very difficult to reach, not least because of large differences between countries in incomes and hence in the valuation of and preparedness to pay for the conservation of environmental resources. In those circumstances, the wealthier and more-concerned environmental groups will look for other ways to influence the extent of global environmental damage inflicted (as they perceive it) by other countries. In the case of tropical deforestation, for example, debt relief for nature swaps or other foreign aid arrangements could be used to compensate developing countries for not felling, but a free- or at least cheap-rider problem arises in getting international funds together to make such payments. Hence the interest of environmental groups in using trade policy instruments as sticks by which to influence behaviour in other countries.

Environmental groups are often misguided also in terms of the environmental impact of trade liberalization through its effects on the international location of production and consumption. Take as examples two of the world's most distorted commodity markets, namely those for coal and food:

both tend to be priced well above international levels in advanced economies and well below them in developing countries (particularly the former centrally planned economies). It is not difficult to demonstrate that liberalizing trade in these commodity markets is more likely to improve than to worsen the global environment, especially if complementary environmental policies are also put in place.

The case of coal trade liberalization

The burning of coal, which supplies nearly one-third of the world's energy, is a major contributor to local and international environmental problems, including global warming and acid rain. Since liberalizing trade in a commodity typically leads to an expansion in its global consumption, one might expect coal to be an example where trade reform would worsen the environment. But in fact this need not be the case. On the contrary, provided domestic taxes on coal consumption are introduced or adjusted to ensure the coal price to consumers does not fall when trade is liberalized, both economic welfare and the environment would improve.

Coal import restrictions imposed by numerous industrial economies, together with their subsidies to domestic coal mining, ensure that industrial countries as a group (which account for one-third of global coal consumption) import less coal than they would if their markets were unrestricted. This has depressed the international price of coal (and hence of other energy sources). If those domestic producer subsidies and import restrictions were to be replaced by a tax on coal consumption which kept the consumer price in those industrial countries at its present level, coal production would decrease and imports would rise but consumption and hence domestically generated pollution from coal use would remain unchanged. Moreover, greater demand by those countries for coal imports would raise the international price of coal (and other energy sources), thereby reducing energy consumption and hence pollution in the rest of the world.

While industrial country reform alone would lower global pollution, it represents only half the story. This is because coal is priced at only a small fraction of the international price in many developing and former centrally planned economies (the latter accounting for about half the world's coal consumption). Should these countries also reform their coal markets their domestic prices would rise substantially, leading to less coal being burnt and hence less pollution from these countries. While the increase in their exports would depress the international coal price, more or less offsetting the increase that would result from liberalization by industrial economies, this would not cause pollution in other countries to rise so long as the latter's tax on coal consumption was adjusted so as to prevent their domestic consumer price from falling below the pre-reform level.

Hence coal trade liberalization in poorer countries -- especially the former centrally planned economies -- could add substantially to the positive global environmental effects of liberalization in advanced industrial economies (not to mention the beneficial effects it would have on acid rain and on visual pollution in downwind neighbouring countries, as Japan and Korea are all-too-well aware of with China so close). And since such reform would at the same time add to economic welfare as conventionally defined, for the usual gains-from-trade reasons, it contrasts markedly with the various proposals to reduce global warming by imposing carbon taxes globally -- proposals on which international agreement in any case would be extremely difficult to reach.

The case of food trade liberalization

With respect to the changes in the mix and international location of production that would accompany food trade liberalization, environmental groups are concerned in at least two ways. They fear that in the highly protected countries of Western Europe the rural countryside and villages will become less visually attractive and less populated as farmers respond to lower domestic food prices

by getting bigger or getting out . And they fear that the higher food prices in international markets, following reduced exports/increased imports by the highly protectionist economies, will raise land prices in tropical and Southern Hemisphere countries which will stimulate greater deforestation (to expand the area of agricultural land) and heavier doses of agricultural chemicals (which not only degrade the local environment but also cause greater chemical residues in exported food). These concerns are understandable, but they ignore many of the direct and indirect environmental effects which would be involved in the international relocation of production consequent upon farm trade reform.

To illustrate how one might start to more fully examine the effects on the global environment of reducing agricultural support policies, Anderson (1992b,c) drew on some estimates of the production effects of a multilateral reform as simulated by the Tyers and Anderson (1992) model of world food markets. Those estimates were from an extreme simulation: it assumed complete removal of all farmer support policies in all industrial countries and US land set-asides in 1990, and full adjustment in that same year. Even with such a huge liberalization and instantaneous adjustment, the estimated impact on world food output in aggregate is negligible and the relocation of production is minor: grain and meat production would have been 5 or 6 per cent lower in industrial countries and 3 to 8 per cent higher in developing countries. The big declines would have been in Japan and Western Europe. North America and Australasia would have accounted for more than a quarter of the offsetting increases, with developing countries providing the balance.

The results suggest that for the regions where production would fall, the reductions would be a fairly large proportion of output. But for the regions expanding production, the increases are a relatively small proportion of their current output, especially for grain. This is because the price decreases in the former regions are much larger than the price increases in the latter regions. This has important implications for environmental degradation and chemical residues in food, because the contracting regions are relatively densely populated and so use farm chemicals and intensive livestock methods much more than is the case in the expanding regions. In the case of fertilizer and pesticides, for example, the highly protected countries use more than ten times as much per agricultural hectare as is used in Australasia and most developing countries (Figure 3). Furthermore, land-scarce Western Europe and Japan crop twice as much of their total land area as does the rest of the world on average, so the extent of contamination of their soil, water and air from the use of farm chemicals is even greater than Figure 3 suggests, relative to other countries. The relocation of crop production from those densely populated protectionist countries to the rest of the world would therefore cause a much larger reduction in degradation in the former compared with any increased degradation in the latter.

In the livestock sector, the relocation of meat and milk production from the most densely populated rich countries to relatively lightly populated and poorer countries would be associated with a decline in the extent to which the world s livestock is fed grain and supplements rather than pasture. With this would come a decline in the use of growth hormones and veterinary medicines, partly because animals are less valuable in less-protected economies and partly because the risk of diseases spreading is lower with range feeding than in intensively housed conditions. And in so far as this relocation leads to greater use of crop/leguminous pasture rotation methods, so there will be less need for chemical fertilizer and hence less water pollution from nitrates.

What would be, therefore, the overall effects on global land degradation. In those rich countries where price supports are lowered and there are no land set-aside policies, land values would fall which would probably further reduce the use of land substitutes such as farm chemicals, irrigation water and feed concentrates. Over time their use would fall even more as the land price decline reduced the incentive to seek land-saving technologies. But what about land use in the unsubsidizing

countries where product prices would rise following trade reforms abroad? The lightly populated countries such as Argentina, Australia and New Zealand, where most of the potential farming land is already cleared for agriculture, would see a more- intensive use of that land but from its current relatively low base. In tropical countries some land may be attracted from plantation areas, but the major concern of conservationists is that more tropical forests might be felled. How much so is an empirical question about which there is relatively little evidence at present. It is worth noting, however, that during the period 1950-90 world cereal production increased 185 per cent but the area of land devoted to cereal growing increased only 10 per cent (Mitchell and Ingco 1993). As well, available econometric evidence suggests even in the very long-run the elasticity of land area to farm product prices is estimated to be no more than 0.6 in the country of major concern, namely Brazil (Lopes 1977); and since international food prices are expected to be less than 1 per cent higher each year as a consequence of the Uruguay Round, the annual expansion in the area used for farming in Brazil would at most be only a small fraction of 1 per cent.

The above potential changes in the use of land and other farm inputs would not be a problem from an environmental perspective if private property rights were well established, full information was available on the environmental effects of production changes, and optimal environmental charges were in place. The first priority of environmental groups therefore should be to encourage the establishment of the above conditions. If such efforts were made at the time of the trade liberalization, the benefits from trade reform would be even greater.

4. Implications for Asian-Pacific countries and APEC

This paper has sought to clarify a number of matters concerning the nature and some of the trade effects of the greening of world politics. The first point is that the current wave of concern for the environment is much more intense, more widespread, and likely to be sustained and to affect a much broader range of countries than was the first wave around the early 1970s. This is partly because more is now known about the considerable extent to which we are degrading the natural environment. The demand for many of nature's services is increasing also because of rapid population and income growth. By contrast, growth in the supply of environmental services is limited by their non-renewability and/or by incomplete markets for them, particularly in developing economies and at the global level where cheap-rider problems are especially acute.

Second, because of differences in the availability and valuation of environmental resources and preparedness to pay for their conservation, countries will necessarily have different optimal environmental policies. In many cases, however, environmental problems spill over to neighbouring countries and the global commons, both physically (acid rain, ozone depletion, global warming) and psychologically (species depletion, deforestation, animal rights). The resulting challenge to national sovereignty implies considerable scope for friction between countries. This friction is especially great when there are interactive environmental problems, as with global warming, deforestation and biodiversity: developing countries tend to see global warming as caused by wealthier countries' earlier deforestation and continuing high levels of carbon emissions, while wealthier countries see tropical deforestation as reducing the world's capacity to absorb more carbon emissions as well as reducing its stocks of plant and animal species and pristine wilderness areas. Since wealthier countries can better afford to worry about these problems, developing countries feel their citizens should be paid to contribute to rich-country welfare through curtailing tropical deforestation activities.

Third, one of the few ways in which countries with a preference for strict environmental standards can influence the environmental policies of other countries is via trade measures. This should worry Asian-Pacific countries, partly because trade instruments are almost never going to be first-best policies for achieving global environmental objectives but also because they are open to abuse by

protectionist groups seeking covert government assistance. Any intensification in the use of discriminatory trade restrictions for environmental purposes is therefore likely to cause trade disputes and retaliation, which could ultimately undermine the global trading system on which Asian-Pacific dynamism depends. And that system is further undermined by the misinformation being circulated by some environmental groups concerning the effects that further trade liberalization would have on the global environment.

How might individuals and governments of countries in the Asian-Pacific region respond to these developments? Opportunities, as well as challenges, present themselves. New production opportunities will arise in response to changes in the terms of trade brought about by changes in other countries' environmental policies and preferences. This could affect not only the traditional smokestack industries but also service industries (for example, promoting eco-tourism exports), primary sectors (for example, marketing food exports as being relatively low in chemical additives), and high-technology activities (for example, exporting anti-pollution equipment).

The opportunity also exists simply to set an example within the Asian-Pacific region by not using trade measures unnecessarily for environmental purposes, including in the context of negotiations on international environmental agreements, and instead seeking more imaginative and more effective solutions (for example, avoiding tuna import bans by adopting harmonized dolphin-friendly labelling provisions or monitoring the fishing nets used; and controlling the production rather than exporting of tropical timber). The opportunity also exists to set an example in the region by giving higher policy priority to liberalizing trade in cases where it would have the additional benefit of reducing local, regional and global pollution, as with coal.

The key challenge is to limit the current tendency toward greater use of trade measures for environmental purposes in order to avoid undue erosion of the global trading system. This challenge can be met if individual countries minimize the extent to which they use the environment as an excuse to raise import barriers in the region.

In 1992, the world community agreed at UNCED on the importance of promoting sustainable development, including by making trade and environment policies mutually supportive. In the two years that have followed, work in this area has intensified and, in particular, GATT Contracting Parties agreed, on completion of the Uruguay Round in April this year, to establish a GATT/World Trade Organization Committee on Trade and Environment. In the meantime, OECD countries have agreed, as part of the OECD Guidelines on Trade and Environment, that they should subject their trade policies and trade agreements to domestic environmental assessment. And, of course, the Environment side agreement to the NAFTA has set an international precedent of considerable potential significance, not only for the NAFTA member countries, but for all APEC members and indeed for the entire global community.

Meanwhile, many APEC Governments are focusing on new instruments for domestic environmental regulation, largely aimed at internalizing environmental costs and encouraging lifecycle (cradle to grave) management of products, including traded products. As these new measures come into force, more trade-related problems could arise in relation to differing environment-related standards and other technical regulations among APEC members. This could emerge, for example, in the APEC discussions on conformance of standards. But their resolution does not necessarily lie in regional harmonization of environment-related standards, especially process standards. Indeed the vast differences that exist among local eco-systems implies that harmonization could be inappropriate from an environmental perspective. And the significant economic and developmental differences between APEC members implies that harmonization could be unduly costly.

These various factors suggest that new cooperative mechanisms will eventually be required,

including within APEC, through which growing environmental concerns can be managed. Agreement might ultimately be required, for example, on a mutual course of action for resolving potential disputes over trade-related environmental measures in the region (probably soon to take on the acronym TREMs in GATT speak!).

In addition, APEC may prove to be a valuable forum for exploring trade and environment issues further before they are taken up more comprehensively by the WTO's Committee on Trade and Environment, especially given the wide range but relatively small number of economies represented in APEC.

It follows from the various issues discussed in this paper that the interaction of trade and environment policies in the region will have considerable implications for the future direction and dynamism of trading patterns within the Asian-Pacific region. Growth in the APEC region has been predicated on ongoing outwardly oriented liberalization of trade and investment regimes in member countries and APEC members are moving steadily forward towards enhanced political commitment on the trade liberalization front. The push internationally for greater environmental protection, combined with increasing policy interest in the environmental implications of trade liberalization could put the benefits from more liberalized trade in the region at risk. APEC member countries, therefore, need to be vigilant against the potential for disguised protectionism in this arena but also to show genuine openness towards enhanced environmental dialogue in the region. This will help to ensure that on both the trade front and the environment front, APEC member countries are moving steadily forward toward the goal of sustainable development.

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ENDNOTES:

1. See, for example, Baumol (1971), GATT (1971), Siebert (1974) and Walter (1975, 1976). Such protection from import competition cannot be justified on economic efficiency grounds (nor for that matter on environmental grounds), because the environmental policy is aiming to eliminate an unjustifiable (implicit) subsidy arising through undervaluation of environmental resources), rather than to add an unjustifiable tax (Snape 1992).

2. This does not apply equally to all environmental resources of course. The doomsdayers such as Meadows et al. (1972) have been proved spectacularly wrong in predicting the exhaustion of minerals and energy raw materials, for example, because they have failed to take into account economic feedback mechanisms. Beckerman (1992) and Crowson (1992) note that the cumulative world consumption of many minerals during the past quarter century exceeded 'known reserves' at the beginning of the period; but today's revised 'known reserves' nevertheless exceed those of twenty five years ago! The same cannot be said for tropical hardwoods and many fish species, however, although in these cases there is scope to move further from the current 'hunter/gatherer' technology to using land or water for tree crops or aquaculture in the same way as agriculture uses land to produce most of our other food and fibre and softwoods.

3. This is not unlike the US using the threat of withdrawal of MFN trade privileges for Chinese goods

unless China improves its human rights situation as perceived by the United States, or of requiring Mexico to sign a side agreement on labour standards before approving the NAFTA accord.

4. Much of what follows draws on Anderson (1993).

5. Crude though these proxies are, more sophisticated indexes are unlikely to change greatly the relative positions of the country groups shown in Figure 1.

6. Three recent papers reporting evidence in support of the claim that the demand for implementing and enforcing pollution abatement policies is income-elastic are Grossman and Krueger (1991), Radetzki (1992), and Grossman (1994). See also Deacon and Shapiro (1975) on the correlation between income levels and voter attitudes toward environmental priorities.

7. The term 'pollution-intensive production processes' should be broadly interpreted to include activities such as mining in pristine areas or leisure services that may attract undesired local or international tourists.

8. The extent of international relocation of productive activities due to the enforcement of environmental standards should not be exaggerated, however. Recent studies suggest the effect of such policies on comparative costs may be quite minor. See, for example, Leonard (1988) and Low (1992). As well, Tobey (1990) finds little evidence of actual changes in patterns of trade specialization in response to the imposition of environmental regulations since the 1960s. However, as noted by Leidy and Hoekman (1993), the absence of changes in trade patterns may be because import barriers were raised to offset any decline in competitiveness in affected industries.

9. For details of the Montreal Protocol see, for example, Benedick (1991) and Enders and Porges (1992). A list of the other major international environmental agreements with trade provisions is provided in GATT (1992, Appendix 1).

10.For a discussion of other environmentally related trade measures in use or under consideration, see GATT (1992, Part III).

11. The ban on ivory trade again provides a case in point. By lowering the value of elephant products, the ban reduces the incentive for rural Africans to tolerate elephants trampling their crops and so ultimately could result in fewer rather than more elephants in some areas. In other areas, the value of the animal has fallen so much that it is no longer profitable to cull the herd. An unfortunate consequence is that bushland in national parks is being decimated by the increased number of elephants, which is of course endangering other species.

Even the threat of trade restrictions can be environmentally counterproductive. The talk of European import bans on tropical hardwood logs has encouraged Indonesia to ban log exports. But since felling has been allowed to continue, this policy has lowered the domestic price of logs and thereby raised effective assistance to Indonesia's furniture and other timber-using industries to extremely high levels (GATT 1991, p.127). At that lower timber price it is not surprising that less of each tree is now used, leading possibly to more rather than less trees being felled.

12. See the discussion in Hillman and Ursprung (1992) and Hoekman and Leidy (1992a), as well as the empirical evidence analysed by Van Grasstek (1992) of voting behaviour of U.S. senators.

13. See, for example, Shrybman (1990), Ritchie (1990) and Arden-Clarke (1991).

14. Data from Steenbilk and Wigley (1990) and Jolly et al. (1990) suggest that the combined effect of import protection and direct producer subsidies was to cause the domestic producer price of coal to

be above border prices in 1986 by about 100 per cent in the United Kingdom, 240 per cent in West Germany and 290 per cent in Japan.

15. According to data published by the International Energy Agency (1992), during 1988-90 the domestic price of steaming coal used for energy, as a proportion of the West European import price, was 15 per cent in Czechoslovakia, 20 per cent in Poland, 32 per cent in Hungary and 27 per cent in India. Prices in the former Soviet Union may have been even lower, especially when valued at the shadow exchange rate. Prices for steaming coal in China vary a lot by region, but even at the overvalued official exchange rate the Plan prices (which apply to about two thirds of all coal) were well below half the US export price in 1989 (Albouy 1991, p.5). Burniaux et al. (1992, p. 55) suggest the user price of coal in 1985 averaged less than 55 per cent of border prices in all of Eastern Europe, the former Soviet Union, China and India.

16. Evaluations of the costs and distributional consequences across countries of such proposals can be found, for example, in Nordhaus (1991), Burniaux et al.(1992), Cline (1992) and Winters (1992). The Burniaux et al. study models the effects of reducing carbon emissions both with and without current energy user price taxes/subsidies in place. The results -- consistent with the above conclusion - - show that the level of emissions by the year 2050 would be 20 per cent lower if present distortions in energy user prices were to be removed.

17. Of course the demand for farm chemicals depends on more than just the level or distortion to output price, but previous econometric work suggests that a thorough multivariate regression analysis that included such additional variables as wage rates is still likely to find a strong positive correlation between chemical use and output prices.

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