# GREENING TRADE or
# TRADING the GREEN?

## An Heretical View of the Trade/Environment Debate

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**Abstract**

This paper puts a case against the standard trade economics thesis that, given appropriate policies, trade liberalisation will normally benefit the environment (the 'trade beneficence' thesis). I argue on the grounds that proponents of the thesis have too narrow a view of environmental problems, overlook many links between trade and the environment and greatly under-estimate the environmental costs of trade. I outline my alternative views of the problems, giving examples of additional links and costs. I also briefly present a possible alternative model for the international trade/environment regime.

**Introduction**

People not familiar with the ins and outs of current trade debates could be forgiven for being confused over the concept of 'level playing fields'. On the one hand most people are now accustomed to hearing Free Traders advocate these for most trade. On the other hand many prominent Free Traders such as Bhagwati have been known to rail against the concept when discussing 'fair trade' arguments which many non-economists advocate.

The problem, of course, is that there are two separate applications of the term 'level playing fields'. Free Traders advocate these for outputs but not for inputs. Trade in produced goods and services should not, according to them, be subject to impediments or discriminatory obstacles, so there should be uniform international rules to ensure this. But labour, resources or other inputs should not be subject to uniform rules because these form the basis of comparative cost differences, which result in comparative advantage and the impetus to trade. As I have said elsewhere, Free Traders want the playing fields levelled, but not the whole stadium demolished (Dunkley, 1997, p.207).

Thus, according to Free Traders, neither labour nor the environment should be subject to uniform standards, lest a 'slippery slope' to new pervasive protectionism be created and trade undermined (GATT, 1992). They often concede that labour and environmental exploitation (i.e. wages below marginal product and pollution levels above the 'optimum') can occur, but argue that this cannot persist under globally competitive conditions. Liberalisation of trade in goods and services can eliminate most forms of labour exploitation and environmental externalities.

In this paper I want to strike a heretical note by arguing that trade liberalisation and trade per se are not as compatible with the environment as Free Trade theorists claim and that developments since the Uruguay Round have strengthened the grounds for this heresy. My argument is based on two broad grounds and a number of constituent propositions in each. My two broad grounds are that: 1. the above-outlined theoretical underpinning of the Free Traders' assertions is inadequate in the face of environmental complexities, and 2. that there are more linkages between trade and the environment than they believe, many of these involving uncounted costs.

These grounds will be discussed concurrently and the paper draws on previous arguments in my book The Free Trade Adventure (Dunkley, 1997: Ch.10). I also propose some alternative ideas for the greening of the world trade regime.

**Post-Uruguay Developments**

Since the end of the Uruguay Round (UR) there have been a number of developments which I believe somewhat weaken the trade-environment compatibility case.

The first is that the UR set up a Committee on Trade and the Environment (CTE), but despite the addition of an environmental brief to some UR agreements, the WTO's green credentials remain skimpy. The CTE has been active, has published many of its deliberations and has undertaken some consultation with NGOs. However, NGOs have been irked that they are still excluded as observers at this and other WTO bodies. The WTO has candidly said that it does not mind some NGOs but is anxious to avoid ratbag groups (such as militant farmers), so found it convenient to exclude the lot (HCEC, 1996: xxv). The substantive issues considered by the CTE have been minor, and this, I believe, is due to its 'trade priority' view and its lack of understanding of trade-environment linkages, as I will discuss below.

The second development is that the trade/environment issue has, post-Uruguay, been discussed more widely around the world than ever before, and although the outcome has arguably been inconclusive, I believe that evidence for trade/environment incompatibility has been strengthened. The most detailed public enquiry has been by the British House of Commons (HCEC, 1996: Vols. 1 and 2), whose findings included the following:-

- that although trans-national companies (TNCs) seem generally responsible and there is not much evidence of 'pollution havens', some trade-induced environmental exploitation does occur;

- that, in particular, trade-induced agricultural commercialisation reduces the sustainability of farming world-wide;

- that the TRIPs agreement of the UR appears to be in conflict with the UN Biodiversity Convention;

- that there is no significant evidence that environmental regulations are damaging trade.

- that GATT should be extensively amended to ensure that trade becomes more environment-friendly.

The third development has been extensive new research on the issue which, I will suggest below, strengthens the trade/environment incompatibility case.

The fourth development is that a number of cases involving environmental issues have come before WTO panels, and all have been decided against what could be called the 'environmental perspective'. The key ones were the 'turtle-shrimp', salmon, hormone-meat and (indirectly) the banana case. These will be noted below where relevant.

**Drawing the Battle Lines**

Environmentalists and 'trade-related environmental economists' (TREEs) largely ignored each other until the 1990s and especially until the GATT tuna/dolphin case. After this environmental activists argued that trade induced 'pollution havens'; that harmonisation of product standards risked a 'race to the bottom'; that 'trade-related environmental measures' (TREMs) should be permissible; that extra-territorial enforcement of policies should be possible; that 'multilateral environmental agreements' (MEAs) should be encouraged and armed with trade sanctions; that priority should be given to the environment, not trade and so forth.

GATT (1992), TREEs (e.g. Anderson and Blackhurst, 1992) and other Free Traders thence prepared answers, including the assertions that trade liberalisation induces efficiencies, new (clean) technologies and environment-friendly development; that trade policy should therefore not be 'encumbered' by non-economic or 'psychic' issues; that markets will encourage 'green comparative advantage' etc. Thus the battle lines were drawn.

The Free Traders' arguments regarding trade/environment issues are based on a number of underlying assumptions, which are open to question, and if proved invalid, would undermine the 'trade beneficence to the environment' argument (henceforth, 'trade beneficence'). I have identified six such assumptions, and outline these below, along with criticism often levelled, including by myself.

1. Assumption: there are three links between trade and the environment - 'product effects' (whether newly traded items are perverse or benign to the environment); 'scale effects' (the impacts of trade-induced growth); and 'structural' or 'technology effects'

(whether trade causes pollution-enhancing or -abating structural and technological changes).

Criticism: although valid, these effects are complex and probably multi-directional, with other links possible; I will discuss several others below.

2. Assumption: environmental problems are 'externalities', and so are rectifiable by adjusted market means and technological solutions.

Criticism: environmental problems are more complex than this implies (see no. 5 below) and market solutions may not be reliable).

3. Assumption: environmental problems are largely local and so can generally be dealt with through domestic rather than international policy-making.

Criticism: certainly domestic policies are required, but ultimately most, if not all, pollution (or other matters of environmental concern) cross borders and have global implications.

4. Assumption: trade leads to growth and growth is benign.

Criticism: the issue is more complex; trade may not always lead to much growth and some say that the causality is the reverse, or at least bi-directional, in which case it is national development policies which lead to trade and this might not be beneficent to the environment. The benign growth argument is based on what is now being called the 'environmental Kuznets curve' (EKC), which claims of income growth and the environment (as Simon Kuznets did regarding growth and income distribution) that the latter improves with the former. As will be discussed below, this is a complex issue and a questionable assumption.

5. Assumption: environmental problems (pollutants etc.) are generally discrete, linear, homogeneous (negatively valued) outputs which are analysable by conventional micro-economic theory.

Criticism: environmental problems are complex, involving multiple causes and effects, having variable and sometimes irreversible impacts and can be persistent, pervasive but unmeasurable, so micro-economic theory can be useful but seldom wholly adequate.

These issues will be further touched on below as required.

**The Great Debate**

The following arguments make up the key elements of Free Traders' case for 'trade beneficence' and I present these, along with some common responses to them, including some of my own criticisms. The following section looks at some further mechanisms which, I argue, militate against trade beneficence.

1. 'Greenery' begins at home - this is the argument that as most pollution is localised and the 'first best' option for policy-making (Francis Cairncross sarcastically calls environmental concerns 'greenery'[(1)]) is to establish domestic environmental policies for optimally 'internalising the externalities'.

Response - this is alright in principle, but there are three major problems. The first is that many countries do not adequately regulate the environment in practice. The second is that, as noted above, the 'locality' assumption is unjustified. Most pollution finds its way into global ecosystems - local river pollutants end up in the sea and air pollution in the atmosphere. Even if diluted, bioaccumulation often occurs. Environmentalists speak of the 'circle of poison' whereby pesticides from 'clean' rich countries are re-imported in food from Third World purchasers. An increasing number of issues, such as acid rain, ozone depletion, global warming, global commons and genetically modified organisms (GMO) trade are inherently cross-border, as are the 'proliferation' and 'footprint' issues (see below). The third problem is that many environmental concerns are more multicausal than TREEs assume. For instance, the world-wide 'forest decline' problem has been found to be caused, not only by acid rain, but by several hundred contributing substances, some of which will be local and some 'imported'.

If these objections are valid, then there will be justification for trade restriction and extra-territorial action in certain circumstances.

2. Green comparative advantage - this is the claim that comparative advantage means some countries have greater absorptive capacities or resource supply capacities, so trade liberalisation combined with appropriate domestic environmental policies will encourage an optimum degree of 'environmental intensive' production, normally resulting in declining environmental intensity over time.

Response: there are many problems with this argument. First, the use of appropriate environmental policies are crucial to the case, but there is no guarantee that governments will adopt such stances, and indeed debt or competitive pressures may encourage the reverse (see below). Even green sceptics accept that markets are not good adjusters of the environment so that policy-making has to be of high quality (e.g. Cairncross, 1995:215), and this might not always be attainable.

Second, although some studies show that open, trade-oriented countries are more likely to develop industries of lower pollution-intensity than more closed economies, the balance of evidence is not strong (Rauscher, 1997). This result may be due to excessively heavy industrial development in socialist-oriented countries, and evidence regarding resource intensity is even less clear-cut. Some studies finding this result count Chile as a 'clean' country, whereas many non-government organisations (NGOs) regard Chile's new orientation to commercial agricultural exports as environmentally disastrous. Some modelling suggests that certain countries may have comparative advantage in pollution-intensive industries, and that imperfectly global competitive conditions may reverse the declining pollution-intensity results.(2)

Third, the notion that some countries have more absorptive capacity and so can 'afford' more pollution is generally rejected by ecologists on the grounds that this is hard to measure and such capacity changes over time (Dunkley, 1997:203-4).

3. The 'clean' technology case - closely associated with the previous argument is the assertion that trade liberalisation, together with a 'strong' intellectual property rights regime, makes the latest 'clean' technologies available, thus ensuring an environment-enhancing trade/growth process.

Response: the claim is partly valid and the OECD has estimated that some 75 per cent of all technology transfer is via trade flows. There is evidence that such trade often up-grades the environmental-friendliness of industries, especially in countries at a lower level of technological development to the exporter.(3)

On the other hand, many things can go wrong. The technology transferred is not automatically the latest, nor environmentally benign, nor at adequate levels to make a difference. The prominent US environmental economist-turned growth critic, Robert Ayres

(1998:146) says that extensive government intervention would be needed to ensure that technological innovation and imports are beneficent, especially in resource areas where market signals are poor. Some Third World countries still buy old technology because of lower cost and appropriate labour intensity, irrespective of environmental impact. Trans-national companies (TNCs) do little or no R and D in Third World countries[4], so environmental suitability is hardly guaranteed. For instance, most energy technology transferred to Third World countries by private power producers to the mid-1990s was unadapted coal-fired plants.[5]

Many TREEs, notably Kym Anderson, regularly assert that agricultural trade liberalisation will, via the elimination of input subsidies and shifts of production to labour-intensive countries, normally improve the environmental basis of farming. However, innumerable environmentalists have shown that there is more often a tendency for trade-induced commercialisation of farming in all countries, and this is usually chemical based (e.g. Mander and Goldsmith, 1996).

Finally, it cannot be assumed that all new technology is 'clean'. Electronics, for instance, is usually assumed cleaner than older 'chemical-mechanical' systems, but although this may be so in processes, microchip production is extremely polluting, emitting up to 100 toxic gases, acids and solvents, which have contaminated soils around all production sites. Trade and global dispersion of the industry may have reduced attention to this matter.[6] Electronic processes also involve electromagnetic radiation (EMR) whose effects are of concern, though heavily disputed.

4. The Pollution Haven Myth - this is the argument that environmentalists' claims of a tendency for some countries to seek trade advantage or investment capital by lowering environmental standards are untrue. It is actually primarily an empirical argument, suggesting that cost savings are too low to be an incentive and that evidence of industry shifts or other 'eco-dumping' processes is minimal. Some TREEs accept that in theory eco-dumping can occur (due to comparative advantage in pollution-intensive sectors), but claim that it is only a temporary phase of development.

Response: although it is true that environmental compliance costs are usually assessed at 2-3 per cent or less of total production costs for 85 per cent of US industry, for instance, this figure can be as high as 20 per cent for sectors such as chemicals. The literature, both mainstream and non-mainstream, increasingly cites at least some cases of trends towards

standards-induced industry shifts, especially where higher compliance costs prevail, including chemicals, metals, oil refining, pulp and paper, furniture and so forth.(7) Japanese re-location of 'dirty' industries to Asia is well documented (see below).

It is also becoming apparent that energy-intensive industries are drifting to non-OECD countries, apparently due to a combination of electricity being made artificially cheap for that purpose and to generally lax environmental standards(8). NGOs claim to have documented many on-the-ground cases of pollution haven strategies, of which Mexican *maquiladoras* are only the most discussed (HCEC2, 1996). It is widely documented that, although TNCs usually employ higher environmental standards in Third World countries than local firms, their standards are usually lower than at home(9).

Overall, I suggest that the evidence for eco-dumping has strengthened somewhat since the UR, thus undermining the trade beneficence argument, and it also indicates potential for future exacerbation of the problem, even if it is not an overwhelming factor at present. If 'pollution shifting' is occurring, it can have what is being called a 'leakage effect' - i.e. an environmental policy in one country, say carbon abatement, can be counteracted by the restricted industry shifting to a less regulated country.

5. Growth to the Rescue - this is the argument that there is a direct, generally positive relationship between trade, growth and the environment such that trade liberalisation leads to economic growth which leads to environmental improvement. The latter link allegedly occurs due to income growth raising environmental awareness and 'green values', as well as making resources available for environmental research and technologies. More precisely, the relationship between growth and the environment is claimed to be a 'bell curve', or an inverted U-shape, with growth initially increasing pollution up to a per capita GDP level of around US$5,000, but thereafter declining due to the above factors. This has become a major argument by TREEs (e.g. Anderson and Blackhurst, 1992) and by free trade officialdom (e.g. GATT, 1992) for 'trade beneficence'. See Diagram 1 below for a modified depiction of the curve.

Response: this argument seems counter-intuitive, greenies always having assumed that growth is the main cause of pollution. Some are now calling this argument the 'environmental Kuznets curve' (EKC) following an earlier thesis by Simon Kuznets that growth initially worsens, then improves, the distribution of income.

The EKC theory is based on a limited number studies whose results have sometimes been over-generalised. Some suggest, for example, that the EKC is only a broad, general relationship which does not hold for all countries or localities and certainly not for all pollutants - e.g. CFCs and $CO_2$ show a direct relationship with growth.(10) Recent research by critics of the thesis, who include Nobel Laureate Kenneth Arrow, finds that although there are EKC patterns in the data, there is a range of qualifications and complications, including the following:

- many of the studies use per capita pollution data, whereas it is usually absolute levels of pollution which affect the environment;

- environmental effects of growth are best captured by consumption rather than production effects, and when linked with trade, consumption obscures the real impacts of growth, many of the polluting products or processes being exported to countries not studied in the research so far - also see below(11);

- when the effects of energy intensity and trade in manufactures are considered, the bell curve effect may be diluted or eliminated because OECD countries increasingly reduce their energy use (and associated adverse environmental impacts) by importing manufactures from non-OECD states (Suri and Chapman, 1998); the manufacturing sector appears to display a positive relation between income growth and pollution(12);

- the link between income growth and pollution alleviation is not clear-cut for all countries or all periods; it is strongest for pollutants with local impacts, low abatement costs and which require few lifestyle changes; the link varies over time, exhibiting considerable trajectory variation with policy changes or other historical events; and it generally is less clear-cut with dynamic modelling(13);

- environmental improvement may be linked, not directly to income growth, but primarily to social advances in literacy, political rights and civil liberties, which have just a loose association with economic growth(14);

- most critically of all, a book-length study of the issue by Swedish economist Per Kageson (1998) concludes that, whilst there is evidence for the EKC in general, especially in relation to resource intensity, the absolute levels of environmental

damage already attained in OECD and 'Tiger' countries is serious, and are alleviated rather than eliminated by the growth mechanism; some of the damage may be unmeasured and irreversible in effects;

- some of the literature identifies a further upturn in the bell curve at higher income levels, but this is subject to dispute; the trend may be clearer if factors such as electronic (see above) and indoor pollution are considered, which to my knowledge they have not been in the standard pro-trade literature.

In sum, the key argument that trade leads to growth, which leads to environmental improvement, has some statistical support, but is subject to sufficient doubt as to make it unreliable. Furthermore, for the EKC to be true it requires the correct discretionary policy-making by governments, and the operative factor may be political development rather than income growth per se. The notion that clean environments are only for the rich is nonsense. Where the political climate is amenable, such as in India, environment awareness, even near-rebellion (as in India) can occur at per capita income levels way below the usually hypothesised point of inflection (US$3,000-5,000).[(15)] If so, then it is likely that environmental improvement can occur without rapid income growth, high trade ratios or trade liberalisation.

Overall, I suggest that post-Uruguay evidence has strengthened the case against the trade beneficence argument, even if not fully undermining it, and indicates that trade is not the only way to environmental improvement.

There are several other associated arguments which I will not discuss in detail, but which should be noted. Two of these involve those GATT principles which do not permit extra-territorial policy actions, nor allow Article XX exceptions on the grounds of 'processes and production methods' (PPMs), these two prohibitions having been invoked in a number of disputes. There seems to be no profound theoretical grounds for the 'outlawing' of these two concepts, just a pragmatic assumption that allowing these would open a Pandora's Box of exceptions, as hinted at by WTO environmental director, Richard Elgin (HCEC2, 1996:81). In other words, it is a value judgment rather than a necessity. Yet many environmental issues involve both of these concepts, which are integral to emerging problems such as GMO trade, forest protection policies, the unresolved leg-hold trap case etc, so the issues will not go away. It is notable that PPMs have been covered in the TRIPs agreement where it suited TNCs to do so!

Another issue is that of MEAs. The WTO would prefer that cross-border environmental problems be dealt with through voluntary MEAs and implemented by consensus - i.e. without trade sanctions. Environmental NGOs, however, hold that trade sanctions strengthen MEAs and that WTO intransigence has a 'chilling' effect on good quality, enforceable MEAs, so are pressing for appropriate amendment of GATT.

Another issue in dispute is what I call the 'green Trojan horse' problem, involving Free Traders' suspicions that TREMs and other environmental measures may be 'captured' by protectionists for their own purposes. In my view this argument is a weak one because there is little evidence of capture, protectionist motivation is detectable and if the environment is given priority (see below) then the costs of 'capture' may not be serious (see Dunkley, 1997:201-2).

The final issue is the 'trade priority' question involving the view that GATT/WTO has always given priority to trade expansion, every dispute involving an environmental question having, to my knowledge and in my opinion, been resolved against the environmental case. In his testimony to the British parliamentary enquiry Elgin repeatedly stressed that the WTO was a trade body and preferred not to know about the environment. When pressed he admitted that the situation could arise in which the WTO may rule in favour of trade and against the saving of a species - i.e. where the potentially saving action was against GATT rules or was extra-territorial (HCEC2, 1996:82). TREEs often assess that the benefits of trade may outweigh its environmental costs, but even some mainstream economists suggest that there is no à priori reason why trade should have priority over the environment (see Adam in OECD, 1997:82). In any case, from the environmental point of view some ecological impacts are irreversible or derive from proliferation (see below), so are not directly comparable with trade benefits.

I conclude, therefore, that the Free Traders' case for trade-environment compatibility has not been adequately made, and that the concomitant principles of 'no extra-territoriality', 'no PPMs', 'voluntary MEAs' and 'trade priority' are not justifiable. For more details see Dunkley (1997):Ch. 10.

**And Another Thing!**

My case against the trade beneficence thesis rests partly on rebuttal of the above arguments as well as on a number of additional points relating to links between trade and

the environment. I argued earlier that there are more links than TREEs usually acknowledge, and that the mechanisms and effects of such links are inadequately studied. Some of these links are extensions of the standard 'product-scale-structural' effects and some additional to them.

1. Competition, Demand and Debt Effects - there is virtually no recognition in the trade beneficence argument that globalisation and pressure on countries to link into the global trade/investment system can create new processes which may be unfriendly to the environment. But there are three main processes which potentially may be so - competition between countries for investment or trade markets, global demand-pull pressures and indebtedness, requiring urgent foreign exchange earnings.

Many examples have been documented, especially by NGOs and environmentalists. The most common is where countries switch to export-orientation suddenly (usually under IMF/World Bank pressure) and are forced by competition to switch from traditional sustainable agricultural or resource harvesting methods to more exploitative commercial methods. For instance, under trade pressure many countries are adopting an export-oriented prawn industry, often in areas where mangroves need removing, and environmentalists claim that about half the world's tropical mangrove forests have so far been destroyed as a result. Often the costs outweigh the benefits because many other fish species spend part of their life cycles in mangrove habitats, so populations are being damaged or destroyed (Goldsmith, 1996:84). In addition, prawn harvesting is often done in a destructive way, especially where turtles are incidentally killed (the US case for turtle protection was thrown out by the WTO - officially on MFN technicalities, but effectively on a trade priority basis).

Another case is tobacco, a major emerging traded cash crop, which has adverse effects on soils in many areas and encourages deforestation both for plantations and for fuelwood in the curing process (Goldsmith, 1996:83). Comparable impacts have been noted for export cash cropping of forest timber, NGOs claiming that current competitive pressures are resulting in extensive and potentially destructive de-regulation (Menotti, 1999), as well as for soy beans and coffee.[16] The case of tourism is more complex, the impacts depending on whether cultural, eco- or resort-based tourism is involved but in the latter case, massively adverse pollution and water resource-use impacts have been documented for resort and golf course development. Moreover, tourism as a development form is often

pushed by governments against the will of local people, so is purely for purposes of trade, and hence there is a direct environmental cost of trade (see Madeley, 1992:77ff).

Pressure for global trade competitiveness can force countries to modify, delay or ignore the need for domestic environmental regulation. It is said, for instance, that in China pro-growth forces are strongly lobbying for minimal regulation. Such pressures are not confined to Third World countries. At present many OECD governments, notably the EU and the US, are refusing to adopt carbon taxes until the others do. Many are now reducing food and other product standards under pressure from both official liberalisation agreements and global competition. NGOs claim that there has been extensive dilution of standards, including in a protectionist country like Japan, and even some mainstream commentators describe this pressure as 'political drag'.(17)

An intriguing, related case appears to be the result of newly emerging global demand. During the 1980s a global market arose for frogs' legs, partly because waterways in OECD countries became too polluted for frogs, so India and Bangladesh established major export markets in this 'product'. Soon however, crop pests were proliferating and the ecological role of frogs in pest control was realised. Pesticide imports rose to several times the export earnings from frogs' legs. In time the situation was rectified by bans on the export of frogs' legs, strictly speaking in breach of GATT Article XI, and pest levels declined, thus reducing pesticide imports.(18) Similar kinds of questionable new commercial exports have been induced by indebtedness, as NGOs have regularly documented, and as some mainstream economists now concede (e.g. Rauscher, 1997:14).

There are several points to note about these cases. First, many of the costs involved are difficult to measure, so the environmental impacts are almost certainly being under-estimated. Second, there is continuing global pressure for cash crop exporting, so many of the costs are just now emerging and may worsen in future. Third, often these trade policies are adopted suddenly and involuntarily via IMF/World Bank conditionalities, so clearly reflect the impacts of trade, although they would be unlikely to be accompanied by adequate policy measures and thus may be just an 'upward slope of the bell curve' problem.

On balance, however, I argue that the environmental impacts of trade are almost certainly under-estimated, and may be on an increasing trend.

2. 'Footprint' Effects - also dramatically known as 'shadow ecology', this refers to the notion that the total environmental impact of a society consists not only of domestic effects but also the effects of all its economic activity, including trade, investment, foreign aid, and even its role in multilateral organisations. Various studies have found 'footprint' effects ranging from several times domestic impacts to as much as twenty times in the case of The Netherlands, though minimal in the case of resource self-reliant countries such as Australia and New Zealand, and some improvements have been observed.(19)

High footprint countries are usually those with large imports of resource and pollution-intensive products, or whose outward foreign investment is in such products. A notorious case is that of Japan where many polluting industries have been 'exported'; Asian fisheries exporting to Japan often use cyanide or dynamite for large, quick catches; native forests for the Japanese pulp industry are being replaced by monocultures and even many Japanese aid programmes are linked to environmentally unsound corporate-sponsored projects.(20)

The implications of national 'footprints' for trade-environment links are clear and dramatic. A country's environmental impacts are clearly under-estimated on the basis of domestic data alone, yet to date mainstream studies of the EKC use only domestic data. As noted above, when trade is considered the results are different, and even then almost certainly not all footprint effects are being captured. Moreover, the effects can be considerable. In the mid-1980s, for instance, the proportion of British $CO_2$ production deriving from the carbon content of imports was over 18 per cent and rising (Adams in OECD, 1997:183). In all probability trade and other footprint effects 'subsidise', so to speak, the reassuring downward slope of the bell curve in higher income countries.

3. Proliferation Effects - this relates to one of the many examples of how economic methodology over-simplifies and under-estimates environmental problems. A proliferation effect, in my own terminology and definition, occurs when at least one of the ecological problems with a product lies in the very spread of the product in the environment. There are two topical examples. Hormone-grown meat, for instance, is of concern for a wide range of reasons, not all of which have been considered in the recent WTO case. Not only are there health concerns regarding hormones in the meat itself and effects on the animals, but also concerns about the 'feminisation of species' problem which derives from proliferation in the environment of female hormone-mimicking chemicals. There is a similar proliferation concern with the use of antibiotics in animal raising, over-use inducing ineffectiveness. Likewise with GMOs, the current concerns include possible health effects

of the products, but particularly involve the increasing evidence that GMOs can inter-breed with wild species more readily than originally anticipated, thus posing enormous ecological dangers (see Dunkley, forthcoming). Proliferation also involves the displacement of natural species. Trade is, of course, integral to proliferation.

4. Process Effects - as briefly mentioned above, GATT rules have always prevented discrimination between 'like products', thus disallowing Article XX exceptions on the grounds of processes or production methods (PPMs), and I argued above that there seem to be only practical, not theoretical, reasons for this. There are several problems with dogmatic adherence to this provision. First, most environmental impacts occur via PPMs, or else are subject to multiple causes, including via PPMs, so excluding these is like the Catholic Church excluding abortion for pregnancies due to 'temporary passion'.

Second, there is likely to be an increasing number of cases before the WTO involving PPMs, including the two already mentioned, i.e. hormone-bred meat and GMOs, so allowable PPMs will make an important difference. Third, ecolabelling is a major, mainly voluntary, method currently being used to provide guidance to consumers about PPM impacts, and although these have not been opposed by the WTO (investigations are still under way), some countries nevertheless consider ecolabelling discriminatory and may challenge it through the WTO (HCEC1, 1996:XX). In my view PPM exceptions will have to be allowed or else trade will have an increasingly serious impact on the environment (also see Cairncross, 1995:230-1).

5. Transport Effects - these are related to the standard 'scale' effects, but are usually not considered serious, amongst mainstream economists, because transportation costs are only a tiny proportion of total production/distribution costs (1-2 per cent or less), because trade liberalisation and micro-economic de-regulation are meant to reduce transport costs even further and because transport costs are minimal with services trade, which is a growing portion of all international commerce. But these claims overlook the two key problems - that for the environment it is absolute costs which count (these rising directly with trade), and that the full environmental costs of transport are probably under-estimated.

Almost all research suggests that even if trade liberalisation and transport de-regulation reduce unit transport costs as Free Traders claim, such positive 'regulatory effects' and improved 'technology effects' are certain to be outweighed by negative 'scale effects'. Some transport efficiencies, for instance, derive from larger vehicles, but these can have

disastrous effects on roads and buildings, especially older 'heritage' structures, yet these costs are probably not counted.

The UR is projected to increase international transport by 4 to 5 per cent, the EU single market by several-fold and NAFTA by a factor of seven. Much of the increases is projected to be by road, which is up to 50 times as polluting as rail, or by air freight, which trebled between 1985 and 1997, another trebling being projected to 2017. Shipping is projected to almost double between 1997 and 2010, due variously to trade liberalisation and economic growth. Road modes account for over 80 per cent of all transport-derived $CO_2$ emissions, 50 per cent being from cars and light transport, 33 per cent from heavy vehicles. Air freight is 47 times as energy intensive as shipping, and for food conveyance often costs many times the calorific value of the food transported. The EU is projecting a 30-50 per cent increase in pollution and noise due to liberalisation-induced transport increases.(21)

Much of the increased transport is economically rational but ecologically irrational, induced by a situation where trade is liberalised but labour costs vary considerably. Europe is rife with cases where parts are trucked right across the continent for processing or assembly and back again. The same thing is increasingly happening globally. Yet, as indicated above, much of the external cost is uncounted. Transport externalities (noise, pollution, accidents etc) are estimated, for many countries, at 3-5 per cent of GDP and higher still if climate change costs and others such as those mentioned above and below are included. Such a figure is several times the usual estimate for direct, accounting-based transport costs.(22)

The implications of all this are clear. Although most transport increases derive from domestic economic growth, these also relate to trade expansion, which is out-pacing GDP growth world-wide. The point is that transport increases are directly related to trade and GDP growth via the bell curve and almost certainly the environmental costs are under-estimated, thus again 'subsidising' the downward arm of the bell curve (see Diagram 1). Trade may therefore be more damaging to the environment than is generally recognised.

6. Biome-Crossing Effects - this concept, named by myself on the basis of recent scientific evidence, is closely linked to the transport issue and relates to the ecological impacts of shipping. Biomes are the basic ecological regions of the Earth, most species originally being confined mainly to these regions, and although gradual natural crossings did occur, these were sufficiently slow to enable adaptation. Human global colonisation

and trade has greatly accelerated such crossings, especially in the last two centuries, Australia being the exotic-species capital of the world.

Recently, evidence has emerged of a direct and serious link with trade and transportation through the introduction of exotic marine species. Although these have been known about for a long time, the full extent of infestation in Australia, and Victoria specifically, has only become apparent with the completion of a decade-long study of Port Phillip Bay by CSIRO and other bodies. The study has estimated that the Bay contains some 170 exotic species, most arriving since White Settlement and probably all through shipping. Most seem not particularly harmful at present and in ecological balance with predators, but a few are not, the North Pacific Seastar (*Asterias amurensis*), for instance, having increased in population from 150 to 12 million within a year or two. Another is Japanese kelp (*Undaria pinnatifida*) which latches onto ships, dock pylons and so forth, breeding prolifically.(23)

The culprits can be summarised as ballast, bilges and bottoms, along with paradoxical costs of new technologies. Once ballast consisted of rocks and cleaning was done labour intensively in dry docks. Today pumping and cleaning technologies facilitate the pumping of seawater for ballast, which directly transfers aquatic and demersal (bottom-dwelling) species world-wide, and in-water hull cleaning which is cheap but causes the hull-fouling species to drop to the sea-bed. These new methods are almost certainly causing an acceleration of biome-crossing, and such exotics are adversely affecting shellfish and other aquatic industries around the world. Some 68 of Melbourne's in-bound shipping continues to other Australian ports so exotic arrivals can quickly spread.(24)

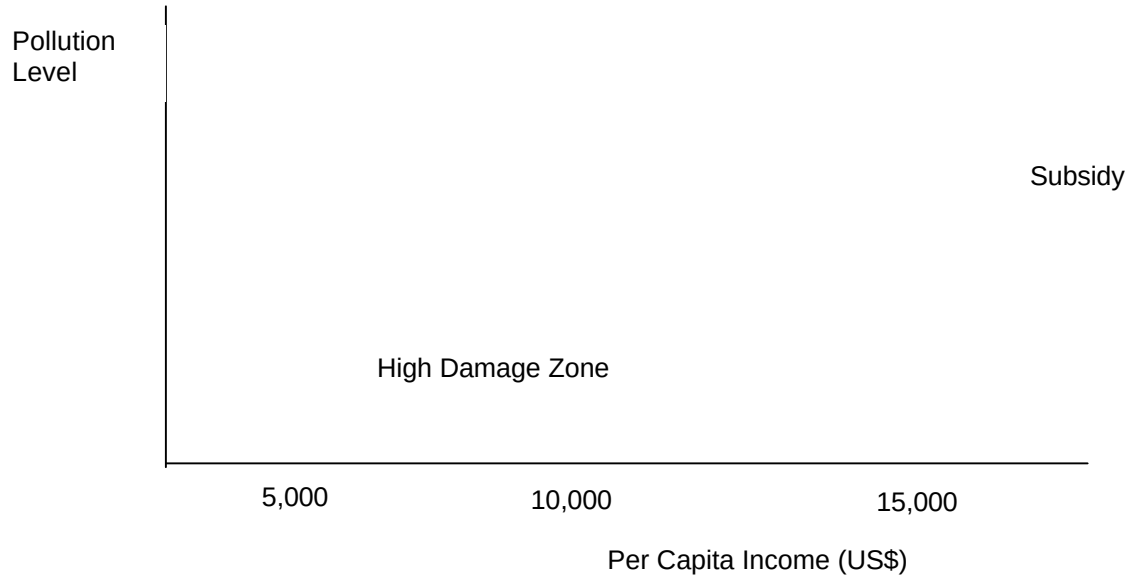
At first sight the problem would seem to be manageable through regulation and/or optimising pollution charges, but to date virtually no thought has been given to policy solutions and monitoring could be difficult. Again, global competition is a problem because cost competitiveness requirements induce quick ballast discharge and regular cleaning (hull-fouling slows ships and raises costs). This story suggests a clear, direct impost of trade upon the environment, the costs of which have not been counted in any impact studies to date.

In conclusion, I have briefly examined eleven arguments against the trade beneficence thesis, some being rebuttals of pro-thesis arguments and some involving new slants on the question. I believe evidence is strengthening against this thesis and that the environmental costs of trade have been under-estimated. This is so because links between trade and the

environment have been inadequately studied, the impacts of trade have been too narrowly defined and many environmental costs of trade have been neglected.

**Diagram 1**

**The Ecological Kuznets Curve (EKC)**
**or The Bell Curve**




**Notes**

1. The EKC is a concept widely used in the literature and here modified by the author as required.
2. The curve purports to show a 'bell' or 'inverted U-shaped' relationship between pollution and income (or GDP) growth - i.e. the former rises with the latter to a per capita income level of about US$5,000, thereafter declining as values change and R and D is applied to finding technological solutions to environmental problems.
3. The curve may turn up again at higher income levels, though this is not clearly confirmed by data at this stage.
4. Pollution never returns to its pre-industrial levels, so the world does become more polluted with growth.
5. The downward slope may be 'subsidised' by various factors identified in the paper (e.g. 'footprint' effects), or by various unmeasured costs (transport, 'biome-crossing' etc).
6. There may be a zone in which, at the higher pollution levels temporarily attained, some degree of permanent damage is done.

**Greening the Millennium Round?**

I have outlined a few prognostications for the possible Millennium Round elsewhere (Dunkley, forthcoming), so will only briefly consider the options here. The current world debate about new directions for trade/environmental administration is complicated by the wide range of environmental consultations and bodies which have arisen recently, and by strong differences of opinion. There are two main areas of discussion - what amendments to make, if any, to GATT and what new international environmental organisation(s), if any, should be established.

As regards amendments to GATT, TREEs want few if any, arguing, as outlined above, that 'green comparative advantage' must be observed, that trade is not a root cause of environmental problems, that standards improve with trade, that there is a risk of protectionist 'capture' etc.(25) I believe that the arguments I have presented above undermine these assertions and that some amendment is justified.

Green groups tend to want TREMs and MEAs included in Article XX, as well as allowance for the precautionary principle and PPMs. The EU has proposed amending Article XXb to mention the environment as a ground for exceptions to trade liberalisation, and a new sub-section to permit trade sanctions in MEAs. The British Parliamentary enquiry (HCEC1, 1996) concurred, and even wanted animal and human rights included as an Article XX exception.

I agree with the latter group of proposals and suggest that the following amendments to GATT are required:-

1. an addendum to Article XXb at least allowing the environment in general as an exception, thus permitting the use of TREMs (green tariffs and the like) for purposes of 'internalising' the costs of trade externalities; human and animal rights should also be considered, for, if included, are likely to be only occasionally invoked; this would, for instance, allow the long-running leg-hold trap issue to be considered, and to allow the rejection of China as a WTO member until it reforms its appalling human rights record.

2. an addendum expressly allowing MEAs, with trade sanctions where the signatories deem these appropriate;

3. amendments where appropriate to allow PPMs coverage in GATT, especially in Article XX exceptions;

4. a general provision in GATT which gives the environment equal priority with trade;

5. amendment of GATT and other appropriate agreements, notably the TBT Agreement, to give some allowance to the 'precautionary principle', consumer concerns in standards setting and an element of extra-territorial enforcement.

Free Traders will resist such proposals, especially 4 and 5, but they have to understand that many people rate environmental issues much more highly than trade, so that if the WTO persists with its trade priority dogma, it is likely to find its legitimacy continually challenged in the international community. Free Traders' concerns about the 'open slather' possibility is understandable, but I argue that the risk is worthwhile for a stronger international environmental regime, which I believe does need the above policies, given the uncounted trade costs to the environment discussed above.

As regards new organisational structures, proposals range from a minimalist 'panel of environmental advisers' (PEA) to a fully fledged new environmental organisation. Outgoing WTO director-general, Renato Ruggiero has proposed a model of the latter, provisionally designated a 'world environmental organisation' (WEO), but with largely only advisory functions. Mainstream economists John Whalley and colleagues, have proposed a stronger WEO with the job of brokering environmental improvement 'deals' between countries, acting as an umbrella for WEAs, monitoring compliance with such deals and agreements, assisting environmental policy implementation at the national and international levels, support for NGOs doing this and so forth.[(26)]

Various NGOs advocate an international body, often designated the 'Inter-governmental Panel on Trade, Environment and Sustainability' (IPTES), which would liaise with existing bodies, integrally involve NGOs, advise on environmental questions and ensure integration of trade and environmental issues. Some versions have the UN Environment Programme (UNEP) and UNCTAD as joint conveners of an IPTES to ensure Third World participation. A few NGOs are also investigating the concept of 'international commodity-related environmental agreements' (ICREAs) which would provide positive incentives such as trade

concessions or commodity agreements, rather than trade sanctions, for the enforcement of environmental standards (HCEC2, 1996).

Unfortunately there is currently a proliferation of international bodies with environmental roles - UNEP, CSD, GEF, ISO, MEA secretariats etc - and innumerable policy proposals, but no consensus. Many of these proposals are disconnected from existing structures and are of questionable viability. I suggest that there should be a WEO-type body, but connected to the UN and based on the existing UNEP, with a status comparable to the ILO. It should advise the WTO and WTO panels on environmental issues; seek reconciliation of trade and the environment; promote, monitor and enforce MEAs; assist with national environmental policy-making; undertake requisite research; and involve representation of suitable NGOs.

If such a body could produce a good 'green' consensus there may be no need for the sorts of amendments to GATT discussed above. But while what I and many others consider extreme trade priority exists, and trade costs to the environment of the sort I have outlined here are not acknowledged by the trade 'club', such a consensus is unlikely and demands for amendments will grow. The setting up of such an organisation would be a good starting point. The most critical goal is to get all governments implementing good environmental policy-making, for which a combination of sanctions and inducements may be required.

## Conclusion

I have argued here that Free Trade economists adopt an unduly narrow understanding of the nature of environmental problems, of trade/environment links and of the costs of trade impacts on the environment, both direct and indirect. Such costs are higher than they acknowledge. Solutions require a clearer possibility of the use of TREMs; stronger MEAs; assistance for poorer countries to implement environmental policies; better research and monitoring of trade costs; quality environmental advice to the WTO; involvement of NGOs; recognition of PPMs, extra-territoriality and the precautionary principle; and higher priority for the environment relative to trade. These solutions should be sought through a new international environmental body and through amendments to GATT if necessary.

Increasing numbers of commentators, including some mainstream economists[27], are now prognosticating an end to the 'growth and free trade paradigms' - i.e. the view that human progress is best served by persistent economic growth, the maximum freedom of trade and

increasing trade volumes. Until the Free Trade 'club' understands the nature of this challenge there will be no global consensus about the trade/environment issue.

**Notes**

1. Cairncross (1995) and regularly in The Economist.
2. Rauscher (1997); Ulph, and Ulph and Ulph in C. Carraro et al (eds), Environmental Policy and Market Structure, Kluwer, Dordrecht, 1996.
3. See articles by Johnstone and others in OECD (1997).
4. Johnstone in ibid:231.
5. Jones and Youngman in ibid:206.
6. See J. Mazurek, Making Microchips, MIT, Cambridge Mass. (1999).
7. Especially see articles by Esty et al and Sprenger in OECD (1997), and Rauscher (1997).
8. Jones and Youngman in OECD (1997:207ff).
9. Sprenger in OECD (1997):339; Suri and Chapman (1998).
10. See Dunkley (1997):204ff and sources cited there.
11. D. Rothman, 'Environmental Kuznets Curves - Real Progress or Passing the Buck?', Ecological Economics, 25, 1998.
12. Studies in Swedish by Wibe, cited in Kageson (1998):8-9.
13. Arrow et al (1995). D. Rothman and S. de Bruyn, 'Introduction'; S. de Bruyn et al 'Economic Growth and Emissions'; G. Unruh and W. Moomaw, 'An Alternative Analysis of Apparent EKC-type Transitions', in Ecological Economics, 25, 1998; Kageson (1998).
14. M. Torras and J. Boyce, 'Income, Inequality and Pollution', Ecological Economics, 25, 1998.
15. G. Dunkley, People for Change, VUT and CAA, 1993; K. Ainger, 'The Meek Fight for their Inheritance', Guardian Weekly, 21 February 1999:23.
16. Friends of the Earth studies - summaries in HCEC2 (1996):116ff.
17. M. Hiroko, 'Liberalisation of Imported Foods', AMPO, 28/4:31-2. Esty et al in OECD (1997):163. On China: W. Zhang et al, 'Can China be a Clean Tiger', Pacific Affairs, Spring 1999:34.
18. As for Note 16.
19. J. Proops et al, 'International Trade and the Sustainability Footprint', Ecological Economics, 28/1, January 1999.
20. J. Taylor, 'Japan's Global Environmentalism: Rhetoric and Reality', Political Geography, 18, 1999.
21. Goldsmith (1996):85-6; Rauscher (1997); Dunkley (1997):205-6; Jones and Youngman in OECD (1997):208ff; V. Menotti and L. Sobhani, 'Globalisation and Climate Change', The Ecologist, 29/2, May/June 1999:178.

22. Sprenger in OECD (1997):344; Weaver in Ayres et al (eds), Eco-Restructuring: Implications for Sustainable Development, UN University Press, Tokyo, 1998.

23. Port Phillip Bay Environmental Study: Final Report, CSIRO, Melbourne, 1998.

24. Ballast Water, Hull Fouling and Exotic Marine Organism Introductions via Ships - A Victorian Study, EPA, Melbourne, May 1996.

25. For example, Kym Anderson in A. Kruger (ed), The WTO as an International Organisation, Uni of Chicago Press, Chicago, 1998; also generally, Anderson and Blackhurst (1992).

26. P. Newell and J. Whalley, 'Towards a World Environmental Organisation?', IDS Bulletin, 30/3, 1999.

27. Arrow (1995); Ayres (1998). I have also argued this in G. Dunkley, The Greening of the Red, Pluto, Sydney, 1992.

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