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The Implications of Trade and Investment Liberalisation for Sustainable Development: Review of Literature

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THE IMPLICATIONS OF TRADE AND INVESTMENT LIBERALISATION FOR SUSTAINABLE DEVELOPMENT: REVIEW OF LITERATURE

FINAL REPORT

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EXECUTIVE SUMMARY

Introduction

This study has been undertaken at the request of the UK Department for Environment, Food and Rural Affairs. Its purpose is to provide a comprehensive and critical review of the literature relating to the implications for sustainable development, in particular the environmental and social dimensions, of the greater liberalisation of international trade and investment flows. The results should inform Defra of the potential impacts of greater trade and investment liberalisation in the areas of Defra's policy concerns. This will enable a full Defra contribution to the DTI's Trade and Investment White Paper and help to ensure that the White Paper is developed within a sustainable development framework.

The study has examined the likely effects of trade liberalisation and greater investment flows on sustainable development, which are considered to have three aspects, namely economic, social and environmental. The study mainly focuses on the environmental and social dimensions of sustainable development, and examines whether these potential impacts of trade and investment liberalisation are likely to be positive. In making this assessment, the study has taken into consideration both their direct (positive and negative) impacts and indirect consequences (see Figure 1).

In the course of the literature review, over 200 studies have been selected for inclusion in the report. Certain of these studies have been of a theoretical nature but most have been empirical studies. Based on these studies, the assessment of the potential impact of trade and investment liberalisation on sustainable development is organised around the following cross cutting effects:

- *Scale effects*: the impact of increased levels of trade, investment and economic activity on environmental and social outcomes.
- *Structural effects*: the implications for environmental and social outcomes of the structural adjustment within and between economies that occur as the pattern of resource use (production and consumption) shifts in response to trade or investment liberalisation.
- *Technology effects*: environmental or social outcomes arising from greater access to new technologies, which in general tend to produce less pollution and use fewer resources than their predecessors.
- *Location effects*: the environmental and social implications of shifts in production and consumption between countries, and possibly shifts within countries.
- The *integration of environmental (and social) considerations* (or lack of it) into global and regional trade and investment institutions and frameworks.

The review has also been carried out within a framework based on Defra's five strategic priorities, to consider how trade liberalisation and investment might impact, either positively or negatively, on each of these areas:

- Climate Change and Energy
- Natural Resource Protection
- Sustainable Consumption and Production
- Sustainable Rural Communities
- A Sustainable Farming and Food Sector

The final part of the study reviews a number of environmental policies from the perspective of promoting sustainable development. The main focus is on the use of environment policy to mitigate the potentially harmful effects of trade liberalisation and greater foreign investment flows, and their compatibility with WTO trade principles and the objective of environmentally sustainable development.

Key Findings

- Much of the literature on the consequences of trade liberalisation is focused on one dimension of sustainable development and seldom provides an integrated analysis of the economic, environmental and social effects of greater trade and investment flows.
- The methodologies used in the empirical studies are very diverse. There are potential difficulties if the use of different methods, in the same situations, leads to apparently different findings. This highlights the importance of clarifying the methodology used in each study and its principal assumptions when interpreting its findings.
- Much of the economic analysis of trade liberalisation uses a combination of classical trade and welfare theory to deduce, *under idealised market conditions*, that trade liberalisation will lead to increased economic welfare and 'optimal' environmental quality. However, *in imperfect market conditions*, 'win-win' outcomes are not guaranteed. In real world situations, both negative and positive effects should be expected. 'Win-win' outcomes may be potentially realisable, but whether this is achieved in practice may depend on the nature and extent of the flanking and other supporting measures that are taken.
- The findings of the empirical studies, though they differ in detail, reach the same conclusions and are consistent with the findings reached in the theoretical studies. Although there are often potential, aggregate economic welfare gains to be made from trade liberalisation and increased foreign investment inflows, these are not necessarily shared by all countries and all socio-economic groups within these countries. Further, a significant number of the cases reviewed contain examples where the environmental (and social impacts) are negative, where existing environmental and social protection measures are insufficiently effective. As in the case of the theoretical studies, flanking and other supporting measures assume a potentially pivotal role, if trade liberalisation is expected to deliver an overall positive contribution to sustainable development.
- The review of the literature provides support for the conclusion that most 'win-win' outcomes for sustainable development are conditional upon the application of appropriate flanking and other supporting measures. Formal appraisals of flanking measures for trade policies are not well developed. However, certain types of environmental policy instruments

that may be used, have been appraised in other policy contexts and these may be adapted for use in the trade policy area.

- The responsibility and authority for adopting and implementing the different flanking and other supporting measures varies. Only some of these lie with the WTO. The remainder fall within the competence of other international organisations, including the multilateral environmental agreements, or more commonly, with national and local government authorities supported by their social partners. Effective co-operation between different government ministries and different international institutions is very important, and in the case of developing countries, financial and other forms of external support are needed to assist the poorer countries to participate fully in the trade and sustainable development process.

Conclusion

The theoretical and empirical evidence that has been reviewed in this study confirms that while trade and investment liberalisation may be a necessary condition for continued growth and hence provide one of the cornerstone policies in promoting sustainable development, it is not a sufficient one. To ensure that trade and investment liberalisation contributes to sustainable development in developed and developing countries, sound social and environmental policies are needed, both at the national and international level. This requires the development of appropriate regulatory frameworks. The robustness of environmental and social policies and institutions, including the adequacy of supporting regulatory instruments, are important determinants of the environmental and social impacts of trade and investment liberalisation.

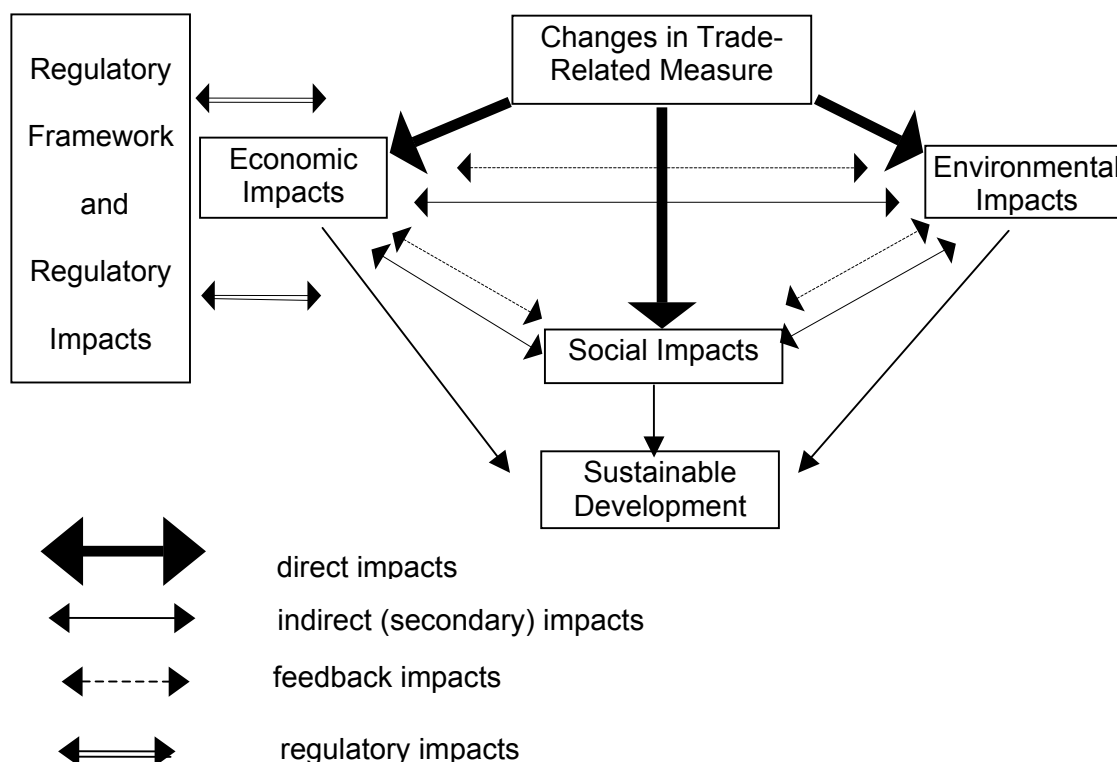
1. ANALYTICAL FRAMEWORK

With the adoption of sustainable development as an over-arching policy goal by many international organisations and national governments, economic efficiency is no longer the sole aim of trade policy and agreements. In particular, the WTO Doha Ministerial Declaration strongly reaffirms a commitment to the objective of sustainable development. There is now a sizeable literature on the effects of trade liberalisation on sustainable development, i.e. on its social and environmental impacts as well as its economic ones. Potential impacts in each of the three spheres include:

- *Economic* impacts: changes in per capita incomes, net capital formation, and employment.
- *Environmental* impacts: changes in air, water and land quality, in biological abundance and diversity; and in other environmental resource stocks.
- *Social* impacts: impacts on poverty and other measures of inequality; effects on levels of health and education; changes in the culture and cohesion of community life.

The analytical framework, which has been used in interpreting the literature, is shown in Figure 1. Trade measures can have *direct* (positive or negative) economic, social and environmental impacts but often also have *indirect* consequences. Some measures (e.g. changes in tariffs or quotas) influence trade flows, which then have a number of direct economic consequences (e.g. on production, employment and income). In turn, these may have social and environmental repercussions. The routes through which the cause-effect relationships operate may be numerous and complex.

Figure 1: Types of Impact of Trade Policy on Sustainable Development



Any change in trade rules may also influence underlying developmental or environmental processes such as technological change, rural-urban migration or change of land use. Such processes are often the most significant influence on the components of sustainable development, such that the effects of liberalisation are felt primarily through the extent to which it accelerates or decelerates these other processes.

Also, the direction and significance of impacts often depends on the nature of the policy and regulatory frameworks in place, and on policy changes that may be made in response to changes in the trade regime. Institutional capacity therefore becomes an important determinant of trade liberalisation outcomes and the impact of a particular trade liberalisation measure can be very different, for example, in a low income developing country where the institutional and regulatory framework are underdeveloped, as compared to a high-income OECD economy with an effective and well-developed capacity for policy analysis and implementation. Flanking and other supporting measures therefore assume a pivotal role in affecting the outcome for sustainable development.

Trade liberalisation is linked to each of the components of sustainable development. However, while overall trade liberalisation can be considered as a necessary condition for sustainable development it is not a sufficient condition. Under *idealised market conditions*, trade liberalisation will lead to increased economic welfare and ‘optimal’ environmental quality. But under *imperfect market conditions*, ‘win-win’ outcomes are not guaranteed. Trade liberalisation can often have negative environmental (and social) impacts, especially where existing environmental and social protection measures are insufficient or absent.

The distribution of all these direct, indirect and dynamic (cumulative) impacts will vary between and within economies, so that a global gain (economic, environmental, social and/or sustainability) may mean significant net benefits for some countries and losses for others. Further, a national net gain may be an accumulation of the gains and losses experienced by different sectors and groups within the national economy.

This calls for an integrated approach where the different elements of the global trade and investment debate are assessed against the ultimate objective of sustainable development. Attention needs to be directed to environmental protection, and also social development, particularly in relation to the improvement in living standards and the reduction of poverty and inequality in developing countries. When there are trade-offs between the economic, social and environmental components of sustainable development, a political choice is needed regarding the weights to be given to each ‘pillar’ of the sustainable development goal.

The analytical framework must also accommodate the many different aspects of trade policy and agreements, which are referred to collectively as trade liberalisation. The areas covered in the WTO’s Doha agenda are shown in Table 1.

Table 1. Trade measures in the Doha agenda

Existing negotiation mandate	<ol style="list-style-type: none"> 1. Agriculture 2. Market access for non-agricultural products 3. Services 4. Trade and environment 5. Dispute settlement 6. Trade Related Aspects of Intellectual Property Rights (TRIPS) 7. WTO Rules (anti-dumping and subsidies; regional trade agreements) 8. Implementation issues in developing countries
Singapore issues	<ol style="list-style-type: none"> 9. Trade and investment 10. Competition policy 11. Trade facilitation 12. Transparency of government procurement
Measures subject to discussion only	<ol style="list-style-type: none"> 13. Other measures Electronic commerce Small economies Trade, debt and finance Technology transfer Technical cooperation and capacity building Least-developed countries Special and differential treatment

The first three areas in the table apply directly to tradable goods and services, and cover tariffs, subsidies and various other non-tariff barriers or distortions to world market prices. The other areas cover more general rules and agreements that apply indirectly to many or all goods or services, including investment.

The degree of trade liberalisation that can be anticipated in the foreseeable future is partial and selective, with each country (and the EU collectively) wishing to retain restrictions in certain areas while liberalising others. The main constraints on liberalisation in the negotiating positions of the EU and the US are in agriculture and the free movement of labour (under Mode 4 of the GATS agreement on trade in services). For other goods and services, these countries have already liberalised their markets fairly fully (except for a degree of tariff escalation for certain types of product), and so the further liberalisation envisaged applies primarily to developing countries. In general, most of the restrictions on liberalisation that countries wish to retain relate to their different strategic interests in key socio-economic areas. Environmental issues have not been a major factor in trade negotiations, although it is increasingly being recognised that the effects on these may be significant.

2. AN OVERVIEW OF THE IMPACT OF TRADE LIBERALISATION ON SUSTAINABLE DEVELOPMENT

In this section we review the literature on the links between trade liberalisation and each of the three main subsystems shown in Figure 1.

2.1 Trade Liberalisation and the Economy

Trade liberalisation and increased openness is generally seen as a means of helping countries to utilise their resources better (WTO, 2003a). This can occur in several ways. First, trade allows a country to specialise in the productive activities that it does relatively better than other countries, and thus exploit comparative advantage. Second, trade can extend the market for local producers, allowing them to better exploit economies of scale, which increases income levels and the efficiency of resource allocation. These effects are known as the static gains from trade. Trade can also have a positive effect on long-term economic growth if it increases the rate of investment and/or improved incentives for the development and diffusion of technology.

The theoretical literature uses a combination of classical trade theory and classical welfare economics to explore the likely overall effects of trade liberalisation (see Anderson and Blackhurst, 1992 and Greenaway and Winters, 1994 for some elements of this approach). Perfectly competitive markets are assumed and comparative static analysis used to deduce an economic welfare gain from trade liberalisation. Environmental problems, as such, do not occur because externalities are internalised within the market system. Provided the time preferences expressed in markets reflect social time preferences, resource use and the resulting impacts on welfare should be optimally allocated over time.

Classical welfare theory is more concerned with static efficiency than dynamic efficiency. Because it uses comparative static analysis, it does not analyse the process of adjustment between one equilibrium position and another, or the social costs that may be associated with this. It is also less concerned with the analysis of equity. Traditionally, it assumes that the existing distribution of income, when the trade measure is taken, is optimal or, if not, other non-trade measures will be taken to correct this. Similarly, it recognises that trade liberalisation may result in a change in the distribution of income. However, it notes, part of the gain in economic welfare could be used to redistribute income so that no-one is worse off

than previously. In other words, trade liberalisation has a *potential* welfare-improving outcome.

A number of theorists have questioned whether the same potentially favourable outcomes will occur if more realistic assumptions are substituted in the analyses. Markets are more likely to be characterised by monopolistic competition or oligopolistic conditions and 'new' trade theory attempts to analyse the different consequences which may result from this. Where markets are imperfect, trade liberalisation may fail to produce the anticipated improvements in economic efficiency. Adjustment costs of uncertain size and direction may be incurred. Environmental externalities may not be internalised, property rights to natural resources may not be well defined, and optimal environmental quality may not be achieved or brought within closer reach. Inequalities in income and wealth will not change, in any clearly determinate way, as a result of trade liberalisation. In summary, given many pre-existing departures from optimality conditions, it cannot be theoretically established, in any determinate form, that trade liberalisation, by itself, can achieve a 'win-win' outcome in either a 'first best' or 'second best' form (Lipsey and Lancaster, 1956).

These findings are not particularly controversial. They do, however, underline the importance of checking the assumptions upon which any theoretical (or empirical) study of the economic impact of trade liberalisation is based when interpreting its findings. In real world situations, negative economic, environmental and social impacts can occur, and both losers and gainers should be expected. Outcomes that contribute to all three dimensions of sustainable development may be potentially realisable but whether this is achieved in practice may depend on the nature and extent of the flanking and other supporting measures that are taken.

The empirical literature on the trade liberalisation and economic growth relationship provides no evidence that countries, in general, are converging in per capita income levels. However, countries that trade extensively with one another tend to exhibit a higher incidence of income convergence than other countries, suggesting that trade provides an important contribution toward the economic growth of nations (Ben-David, Nordstrom and Winters, 1999; Sachs and Warner, 1995). Openness can provide a stimulus to greater efficiency and growth by introducing international competitive pressures and exposure to international technology (WTO, 2003). Other observers have taken issue with the view that openness per se induces growth. Rodriguez and Rodrik (1999) for example, question the measurement of trade openness used in many empirical studies, and argue that there is no clear cut relationship between trade openness and growth, rather that it is contingent on a number of external and country specific factors

2.2 Trade Liberalisation and the Environment

Nordstrom and Vaughan (1999) reviewed a number of studies, which examine the general equilibrium linkages between trade measures and their environmental impacts. They conclude "the above theoretical review has demonstrated that there is no simple one-to-one relationship between trade and the environment, and that the results are often sensitive to the assumptions adopted by individual models ... Let us also stress that general equilibrium models of trade and environment are still in their infancy ... Thus, in waiting for more elaborate theoretical models, we should be somewhat cautious in our conclusions" (p. 31).

Nordstrom and Vaughan (1999) also examine the theoretical underpinnings of the Environmental Kuznets Curve (EKC) prior to reviewing the findings of empirical studies

relating to its statistical form. The main EKC hypothesis, of which there are many variants, maintains that there is an 'inverted U' shaped relationship between a variety of indicators of environmental pollution or resource depletion and the level of income per capita (Barbier, 1997). As per capita income rises in a country, environmental degradation will progressively increase until reaching a peak. Thereafter, as per capita income continues to rise, environmental degradation will progressively diminish. Nordstrom and Vaughan (1999) identify a number of the variables and mechanisms which may influence the relationship between per capita income levels and environmental quality. These include the income elasticity of demand for environmental services, the possible existence of economies of scale in the provision of pollution abatement facilities, structural change during the development process and the influence of different elements of government policy. They observe the diversity of possible values of these variables and the different ways in which they may interact and argue that "these help identify why [the EKC] can assume the multiplicity of shapes that we observe in reality" (p. 49).

The authors further conclude:

"...let us start by emphasising that nothing in the relevant literature suggests that the pollution trajectory will turn downward with increasing income by compelling necessity... income growth, while perhaps a necessary condition for changing the focus from more immediate economic and social concerns to longer-term sustainability issues, is not sufficient to reverse degradation. Environmental policies must follow suit."

Environmental impact assessment studies that have been carried out for trade policy include the North American Free Trade Agreement (USTR 1993, CEC 1999, CEC 1999a, Anderson 2001, Taylor 2002) and the potential environmental impacts of the WTO negotiations for Canada (DFAIT, 2002). The EC has conducted sustainability impact assessment studies of regional trade agreements for EU-Chile (Planistat 2002), EU-ACP countries (PWC 2003) and EU-Gulf States (PWC 2004).

A preliminary overview SIA of the WTO Doha agenda has been carried out as part of the EC SIA programme (George and Kirkpatrick 2003). Detailed sectoral SIAs of the Doha agenda have been carried out for the major food crops sector (Maltais *et al*, 2002) and for pharmaceuticals, textiles and clothing, non-ferrous metals, environmental services and competition policy (Kirkpatrick and George 2003).

UNEP has sponsored a number of case study impact assessments in developing countries, which are discussed below (UNEP 1999a). A second round of studies (UNEP 2002a) has since been undertaken in Argentina, China, Ecuador, Nigeria, Senegal and Tanzania.

The detailed findings of these studies inevitably reflect the specifics of the trade liberalisation policies being assessed, and the characteristics of the economies involved. Nevertheless, they share a number of common features:

- The findings question the inevitability of a 'win-win' outcome, by identifying the potential negative environmental and social impacts of trade liberalisation. This conclusion applies particularly during the often lengthy period of adjustment and in the absence of effective mitigation measures.
- The studies are *ex ante* and involve the estimation of economic, environmental and social impacts that are expected to be significant. They are part, therefore, of a broader

process of public policy impact analysis and consultation, which contributes to good governance. Trade policy is seen, therefore, as a tool for achieving sustainable development and not as an end in itself.

2.3 Trade Liberalisation and Poverty

Winters (1999) carried out a theoretical analysis of the relationship between trade measures and their impact on poverty (Ben-David, Nordstrom and Winters, 1999, Ch. 3). He analyses the different channels through which trade measures may impact on poverty using both simple forms of static, and short and long term dynamic, analysis. He identifies a number of possibilities of both pro- and anti-poor influences and states:

“Thus, it will hardly be surprising that there are no general conclusions about whether trade liberalisation will increase or reduce poverty. I do, however, derive some results about the sort of circumstances under which the effects are likely to be benign and, with them, the makings of a view about how trade liberalisation can be designed to foster poverty alleviation.” (p. 44).

Later, he adds:

“One of the inevitable conclusions from a taxonomy, such as this, is that the impacts of trade on poverty will differ across countries. Thus, great care is needed in generalising from one country’s experience to another, and policy positions for one country will be quite unsuitable for another.” (p. 44).

The relationship between trade liberalisation and poverty has been further analysed in McCulloch, Winters and Cirera (2001). They argue that modelling approaches are stylised with the outcomes depending heavily on the original assumptions and design of the model. Aggregate-level studies are likely to show that trade liberalisation is good for the poor overall where growth occurs as a result of trade liberalisation (the ‘lifeboat effect’), but the differential effects on the poor will be missed. McCulloch et al (2001) also stress the role of institutions, political and social factors in mediating the linkages between trade and poverty.

Ravillion (2000) provides a review of the key issues in the debate over trade, growth and poverty. He argues that those that take a positive approach look at averages over diversities in initial inequalities and how they are changing over time, while more critical approaches focus not on averages, but on how rising inequality ‘dulls the gains to the poor from growth’. This again highlights the problems that arise when using aggregate general or partial equilibrium models, in that the results depend on how the model is specified, and which variables are taken into account, yielding potentially contradictory policy advice (Bussolo and Lecomte, 1999).

In preparation of its White Paper on globalisation (DFID, 2000), DFID commissioned a review (McKay *et al.*, 2000) of research on the relationship between trade openness, economic growth and poverty. The study concludes:

- on average, the poor benefit from increased trade openness in the same proportion as richer households;
- while the effects of trade reform tend to be positive, especially in the medium and long term, it can have significant adverse effects on particular groups, especially in the short term;

- reduction of a country's own trade barriers tends to bring real benefits to its consumers, including poor consumers;
- trade openness, especially import liberalisation, generally has beneficial effects on productivity, the adoption and use of technology, and investment;
- trade openness stimulates economic growth;
- the extent to which trade openness contributes to poverty reduction depends on broader economic and social circumstances and policies.

The DFID study infers that a positive correlation between poverty reduction, growth and openness of trade results from a causal relationship in which openness to trade encourages growth. Brohman (1996) has challenged this inference, by studying the factors underlying the growth of the Asian newly industrialising countries, which have contributed most to the apparent correlation. It is suggested that these countries' growth has been achieved not by liberalisation, but through policies of state intervention and economic nationalism, which themselves have included strategies to enhance the productivity of the poor. Trade openness may then be a consequence rather than a cause of economic growth, which may in turn be a consequence of poverty-reducing strategies. A similar conclusion (Rodrik, 1999) has been drawn from evidence which suggests that successful economies open up to external trade, while open economies are not necessarily successful.

Each of these studies on the trade liberalisation and poverty relationship has its limitations. Those based on economic modelling may not be accurate representations, and may not reveal major effects arising from specific local circumstances. Those based on empirical studies may be misleading if causes and effects have not been correctly interpreted. Those based on aggregate statistical data may suffer from both types of limitation. Even the conclusion that trade openness stimulates economic growth is not demonstrated unambiguously. Between them however the studies show fairly conclusively that for the potential social benefits of trade liberalisation to be realised, the process has to be managed with an awareness of the potential adverse impacts on some sections of society.

Studies of the aggregate relationship between countries' openness to trade and the number of people living in extreme poverty do not show clearly that the incomes of the poor fare either better or worse than average incomes. There is fairly strong evidence of a positive correlation between economic growth and trade openness, but it is less clear whether the relationship is a causal one, and if so, which is cause and which is effect.

Many of the studies show with reasonable confidence that certain types of trade liberalisation policy can have beneficial social impacts, particularly in the long term. Many different adverse effects can however occur for specific sections of society, in both the short term and the long term. While trade liberalisation can in certain circumstances be an enabling factor for social benefits, there is strong evidence that internal policy measures are the most influential factor in reducing the extent and depth of poverty, and in minimising the potentially adverse effects of liberalisation on some sections of society. 'Win-win' outcomes, in which all sections of society benefit from liberalisation, may be realisable in the longer term, but carefully designed policy measures are needed to minimise adverse impacts in the shorter term.

2.4 Disaggregated Studies

Sectoral studies can be viewed as one step towards making trade liberalisation analyses more context-specific. Ervin (2000) comments: “compared to global assessments, they improve the degree of resolution for understanding environmental [and other] effects” (p. 124). However, they may overlook some important sustainability impacts arising from inter-sectoral linkages unless these have previously been identified in global assessments. In other respects, these theoretical analyses are essentially similar to those that have already been described and do not provide discernibly more positive findings on ‘win-win’ outcomes.

Area studies are intended to capture some of the spatial variations in economic, environmental and social impacts, which may result from trade liberalisation. Theoretical studies of this kind are not yet well developed (see, however, Barbier and Burgess, 1996 and Barbier, 2000). Location theory may assist in identifying the variables which influence the spatial distribution of economic activities, population and human settlements. In combination with pollution dispersion analysis, they can be used to assess the spatial distribution of environmental impacts. As the size of the area analysed diminishes, the likelihood of ‘win-win’ outcomes in *each* area diminishes. On the other hand, the areas experiencing negative outcomes can then be identified with greater precision for the purpose of taking corrective action.

Implicit in most theoretical and modelling studies are standard assumptions concerning how individuals and groups of individuals will respond to trade liberalisation measures. Yet these may differ from those assumed, especially in developing countries, because of cultural differences between people in different areas and variations in their economic, social, environmental and institutional circumstances. Theoretically based studies of this kind, which are based upon more realistic behavioural assumptions and which take account of local conditions, are still in their infancy. Some relate to impact assessments of household poverty (Winters and McCulloch, 2000) and, more specifically, impacts on women (Fontana and Wood, 1999) and children (Page, 1999a). Others have analysed how impacts on poverty may then spill over into environmental impacts in forest areas, which may be positive or negative depending on the cultural norms and forest protection provisions in force.

The initial findings of these micro level studies appear to point to a variety of different responses to trade liberalisation measures which can result in unpredicted economic, environmental and social input outcomes, both positive and negative. As in the case of area studies, with which they share some affinity, the greater degree of disaggregation will tend to uncover a greater number of outcomes that are not, unambiguously ‘win-win’. More descriptive, local case studies can provide additional examples of these outcomes, although they often lack the theoretical underpinning examined in this sub section.

2.5 Summary and Conclusions

In summary, this overview of the general literature linking trade liberalisation and sustainable development indicates that:

- The existing literature is incomplete and fragmented in its coverage.
- Under idealised market conditions there is a potential welfare gain but, under more realistic market conditions, the outcomes are indeterminate. The outcomes are most likely to result in winners and losers, when analysed at a disaggregated level.

- Trade liberalisation does not inevitably result in ‘win-win’ outcomes; these are dependent on a multiplicity of factors, certain of which are context specific. Much may depend on the tailoring of trade measures, and their accompanying flanking and supporting measures, to take account of the contexts in which they are to be applied.
- Flanking and other supporting measures are critical factors in determining the significance of the potential impacts of trade liberalisation on sustainable development. However, as yet, the linkages between these policy instruments and those relating to trade liberalisation have not been sufficiently developed, especially in the context of their combined impact on sustainable development.

3. CROSS-CUTTING EFFECTS OF TRADE AND INVESTMENT LIBERALISATION ON SUSTAINABLE DEVELOPMENT

The effects of trade liberalisation are often categorised into scale effects, structural effects, technology effects, product effects, distribution effects and regulatory effects (OECD 1994, UNEP/IISD 2000, UNEP 2002). The literature exhibits a degree of overlap in its treatment of these effects. An alternative classification adapted from George and Kirkpatrick (2003) is shown in Box 1.

Box 1. Cross-cutting Effects

Scale effects

Economic growth and increasing consumption make a positive contribution to the economic and social components of sustainable development, and may be accelerated by increasing trade. However, the resulting increase in the scale of production may be accompanied by an increased use of natural resources and higher levels of pollution, with a negative impact on sustainable development’s environmental component. Economic growth may also make a positive contribution to average income per capita levels. The increase in overall financial capacity may both supply more resources for environmental protection and support greater demand for environmental-friendly goods. However, even though income growth might reduce the load on the environment it does not guarantee an improvement in environmental outcomes.

Technology effects

Technological developments create new products and services whose impacts may be different from those they replace. When these new products or services are traded, this changes the associated impacts. In addition, diffusion of new technology from one country to another, for example through deliberate technology transfer, changes the impacts of products or services that are produced domestically.

Structural effects

Trade liberalisation may lead to structural changes in a country’s economy, through specialisation in those goods or services where the country has a comparative advantage, for example in low labour costs, low natural resource costs, or high availability of skills and socio-economic infrastructure. If the changes favour industries that pollute less, extract less of the country’s natural resources, or provide higher wages, positive environmental or social effects can be expected. If the products for which the country has a comparative advantage have high pollution intensities, a greater dependence on local natural resources, or a high demand for unskilled labour, the effects will be in the opposite direction.

Location effects

Different structural effects in different countries may lead to transfer of production from one country to another, with consequent distributional effects between the trading partners. These may be adverse for some social groups or damaging to local environments. Concerns are expressed that trade liberalisation may promote the use of 'pollution havens' in which environmental regulation is weak, or a 'race to the bottom' in the exploitation of cheap labour.

Regulatory effects

The impacts from all the cross-cutting effects discussed above depend on the nature and effectiveness of social and environmental policies or regulations in the affected country. Trade reforms may themselves have an impact on these policies and regulations, through explicit measures to improve standards, or provisions that impinge on a government's ability to set them. For impacts that have global effects, each country's policies and regulations may be constrained by the need to comply with multilateral agreements, whose aims may overlap with those of international trade rules.

Source: Adapted from George and Kirkpatrick (2003)

3.1 Scale Effects

The issue of whether or not trade liberalisation and economic growth will lead to increased pressures on the environment through increased levels of trade and economic activity has fuelled much of the ongoing trade-environment debate. Neoclassical economists argue that trade liberalisation allows countries to achieve economic growth by maximising output from a given set of resource inputs and they interpret trade reforms more as an automatic movement towards environmental sustainability (Brack, 1998). This is because, according to the theory of comparative advantage, free trade could enable countries to specialise and trade goods and services which they are most efficient in producing. Environmental problems as such, do not occur because externalities are internalised within the market system. The level and composition of environmental impacts may change but the new equilibrium level of environmental quality will, by definition, be optimal. Nevertheless, this optimal outcome is achieved only from a static point of view (Cole, 2000). When dynamics are considered, then the resulting economic growth may lead not only to an increase in efficiency but also to an expansion of economic activities that has adverse effects on the environment. The fact that the latter dynamic scale effect might dominate the former static effect has increasingly raised concerns about future world economic development paths and their "sustainability" features.

The literature reviewed examines the relationship between economic growth both in terms of increased production and increased income per capita, and changes in environmental quality. If trade liberalisation stimulates economic growth, and is shown to result in an improvement in environmental quality, then a 'win-win' outcome (in terms of economic and environmental impacts) will have been demonstrated. If the empirical findings indicate a negative or indeterminate environmental outcome, then the 'win-win' scenario is (at best) unproven.

Moreover, the type of sector subject to reform is of importance in establishing linkages between trade liberalisation and sustainable development, and in particular the potential magnitude of scale effects. If sectors facing high border protection rates before the implementation of trade reforms are extensively based on natural resource extraction then increased market access might lead to serious environmental consequences associated with

resource intensity. And furthermore, access to cheaper sources of energy due to a liberalisation of imports and trade creation effects would exacerbate the environmental damage scale effect. For example, Beghin *et al* (2004) investigate the impact of a unilateral trade liberalisation in Chile on environmental performance. The authors argue, based on general equilibrium simulations, that a unilateral trade liberalisation induces a significant worsening of pollution due to increased access to cheaper energy and expansion of natural resource-based sectors in which Chile has traditionally been competitive. They further demonstrate that the likely increase in environmental damage (emissions of small particles, SO₂ and NO₂) have a substantial impact on social outcomes in terms of urban morbidity and mortality and propose a revenue-neutral environmental tax on air pollution. This abatement measure is predicted to produce health benefits that exceed the foregone real income equivalent to the net efficiency loss induced by such taxes.

Hence, it seems that an increase in the scale of production stimulated by trade liberalisation is very likely to be accompanied by an increase in the use of natural resources and higher levels of pollution. However, though freer trade and increased activity levels might be accompanied (*ceteris paribus*) by adverse environmental effects, a number of other factors might play a crucial role, making it difficult to isolate “pure” scale effects and identify a strong pattern in the commonly-assumed detrimental relationship between increased economic activity and environmental performance. This is emphasised by Morita and Robinson in the IPCC (2001) report where the authors find no evidence of a causal pattern in the economic activity and GHG emissions nexus. The study undertakes several global future scenarios and attributes its findings to the possible emergence of mediating forces (*e.g.* increased energy efficiency and shifts to a service based economy) that might counteract the negative environmental scale effects.

Environmentally beneficial income effects might arise when augmented financial capacity supplies more resources for environmental protection (supply-side effects) and fosters greater demand for environmental quality (demand-side effects) (Esty and Ivanova, 2003). Income or wealth effects of trade liberalisation on sustainable development (in particular on environmental outcomes) are closely related to the scale effects. This is because economic growth stimulated by freer trade tends to be associated with both increasing output and income.

Much of the literature relevant to the growth-environment nexus focuses on empirical tests of the Environmental Kuznets Curve (EKC). The EKC hypothesis proposes an inverted U-type relationship between environmental decay and income per capita. Studies that analyse and test this hypothesis commenced in the early 1990s *e.g.* Grossman and Krüger (1993), who analysed the likely environmental consequences of the North American Free Trade Agreement. Since then, there have been numerous other studies, including those contained in special issues of two journals (*Environment and Development Economics*, 2, 1997 and *Ecological Economics*, 25, 1998) that contain the majority of articles cited in this review.

Most of these studies undertake their analysis at individual country level but a small number use regional data. Many undertake a cross-country analysis, others use time series analysis and some combine both approaches. A number of cross-sectional studies include both developed and developing countries but time series analysis involving developing countries are rare (Vincent, 1997). In general, the coverage of developing country experience is less complete, often because of data limitations.

The indicators of environmental degradation used in these studies vary considerably, both in terms of the range of environmental parameters that are included and in the ways in which each is defined and measured. The number and type of pollutants covered varies substantially, some being measured as estimated emissions and others as ambient concentration levels. Coverage of changes in stocks of natural resources is variable and very incomplete in most studies. Finally, most indicators relate to environmental degradation within a country (*i.e.* resulting from that country's production and final consumption activities) and omit the impacts (negative and positive) of the country's import and export activities on the environment of its trading partners (Rothman, 1998).

A variety of different statistical forms of the EKC have been tested. These include the 'inverted U' shape (which has one peak level of environmental degradation) and the 'N' shape (which has two peaks). Strictly speaking, only one shape (progressive reductions in environmental degradation over the fully-observed income range) unambiguously meets the 'win-win' requirement.

Despite the great diversity of studies undertaken, there is a broad consensus in their findings relating to the 'inverted U' shape of the EKC, even though there is sometimes a difference in emphasis in the ways in which these findings are presented.

Barbier (1997), for example, summarises the findings of fifteen recent studies as follows:

"The EKC hypothesis seems mainly to be valid for the air pollution indicators used, with the possible exception of CO₂ emissions. However, the results, apparently valid across all countries, are not necessarily valid for individual countries ... The evidence for water pollution is more mixed. Many studies appear to have difficulty in finding any significant relationship between water pollution indicators and income ... A myriad of other environmental indicators have also been examined for evidence of an EKC-type relationship. With the exception of heavy metals and a measure of toxic intensity, these indicators generally do not appear to support the EKC hypothesis" (pp. 372-374).

Additionally, even where support is found for the EKC hypothesis, the 'turning point' in the curve can differ significantly between different environmental parameters and between different studies relating to the same parameter (Table 2, p. 375). Very few studies, and these usually of a special nature (*e.g.* Carson, Jeon and McCubbin, 1997), support the hypothesis of continuing improvement in environmental quality over the full income range.

Alpay (2002) finds no statistical evidence that economic development in terms of income per capita or openness to international markets would follow an EKC relationship. The author relaxes the assumption of a quadratic or cubic reduced form specification of pollution with respect to income automatically assumed in previous studies, and directly tests the EKC hypothesis through threshold estimation between pollution and both income and openness to trade. The author finds no evidence of relationship between pollution and income. In other words, an increase in income does not induce improvements in environmental quality, even though it might reduce the load on the environment. The study might be taken to suggest that economic/income growth and trade liberalisation do not guarantee improved global environmental outcomes and that income/wealth effects of increased trade do not necessarily fit the pattern of an inverted U-shaped relationship.

Consequently, the relationship between growth in income levels fostered by trade liberalisation and economic growth and environmental outcomes is of an ambiguous nature and might depend on the type of environmental damage and country under analysis, as well as the rest of the effects discussed herein. For example, inconclusive results are more generally obtained when the hypothesis is applied to deforestation as compared to other environmental problems such as pollution for which the EKC hypothesis has been more successfully tested (Angelsen, 1996; Panayotou, 1994).

The first important finding from the literature review is that, following extensive empirical testing of the inverted U-shaped EKC, its lack of robustness has been clearly demonstrated. Similarly, there is neither theoretical nor empirical support, other than in special cases, for assuming that increases in per capita incomes reduce environmental degradation across the full income range, covering both developing and developed countries.

The second finding is, even if those situations where the EKC hypothesis has some empirical support (*e.g.* certain forms of local air pollution) could be generalised to all forms of pollution, overall environmental degradation would still be predicted to increase as income rises in low income and industrialising developing countries. Their current income levels are well below levels associated with the turning points in most estimated EKCs. Without additional, more effective environmental policy interventions, environmental quality would be expected to continue to decline, as per capita income rises, at least over the medium term (Barbier, 1997, p. 380).

For these reasons, an automatic ‘win-win’ outcome (economic and environmental) from trade liberalisation is not expected. There may be potential economic welfare gains, but environmental (and social) gains are not assured unless other complementary measures are taken. Arrow *et al.* (1995) rightly conclude “Economic growth is not a panacea for environmental quality; indeed it is not even the main issue.” Though this is common ground among most researchers in the field, this is less clearly explained in some literature on the benefits of trade liberalisation.

Once again, flanking and other supporting measures have to be moved to the centre stage in the ‘win-win’ debate. As previously mentioned, this is where recent studies of the cause-effect linkages in the trade measures - economic development - environmental quality sub-system can prove helpful. The better the understanding of these linkages and the extent of their influence, the easier it will be to identify and appraise remedial measures to accompany trade policy changes, which offer potentially better prospects of ‘win-win’ outcomes.

3.2 Technology Effects

New technologies offer the possibility of decoupling economic growth from long-term environmental degradation. Technological change is needed to raise the productivity or efficiency of environmental and natural resources and thereby contribute to sustainable development. The technological effects of trade liberalisation will be positive if the lowering of domestic prices following the reduction of trade barriers encourages imports of environmental goods. Similarly, the reduction of restrictions on FDI should encourage the transfer of environmental technology.

Pearce (2002) argues that technology and environmental policy measures should be seen as closely complementary: a dominant justification for technology policy is the environmental

and human welfare gains it will bring. For example, technology policy and improved resource efficiency would positively impact upon human health through a reduction in the levels of waste and pollution with indirect benefits for economic growth and productivity.

Technological change and human capital can foster sustainable development as long as resources and government efforts are geared towards research that produces less polluting technologies with positive implications both for the environment and for human health. Thus, as emphasised by von Schomberg (2002) technology plays the role of a double agent, *i.e.* on one hand it might foster an intensive exploitation of resources and on the other hand it might provide alternative solutions for a more efficient use of the natural resource base. At the same time, however, the technology effect might have an adverse effect on the pace of sustainable development in poorer countries if the benefits of new technologies (that are more likely to be more environmentally friendly) are not equally shared across the globe.

The potential of mitigation factors, in particular the spread of “greener” technologies across the globe, depends in turn on overcoming barriers that hamper their diffusion, and the extent to which trade liberalisation and globalisation forces will encourage the adoption of less environmentally harmful technologies (Sathaye and Bouille, 2001).

3.3 Structural Effects

Trade and investment liberalisation can lead to structural changes that occur in response to changes in incentive structures. Rae and Strutt (2003) focus on the impacts of agricultural trade reforms on the environment in OECD countries. The authors apply a general equilibrium model to predict changes in livestock and crop production induced by further WTO agricultural trade reforms. They further estimate the impact of those changes on the nitrogen balance in OECD countries. The study draws tentative conclusions that lower farm protection in high-income countries would result in less animal waste output and a decrease in fertiliser input usage in cropping mainly due to a contraction of those agro-food sectors that are heavily supported. However, the positive environmental effects that Rae and Strutt (2003) find are associated only with the liberalisation of the agricultural sector and apply only to the specific case of nitrogen balance. The overall net environmental effects would depend on where resources reallocate after the reduction of protection measures. If the agricultural sectors that are most heavily protected coincide with those that are the most polluting at the country/regional level, the structural effects of trade liberalisation could also kick in enhancing environmental improvement. In other words, the relationship between trade liberalisation and the environment would depend upon changes in a country's output composition from a pollution intensity point of view. For instance, Rösner (2003) finds that the mix of industries dominating high-income countries emits on average 35 percent less air pollutants than does the industry mix in middle and low-income economies. Thus, though market incentives might be positive from an economic point of view, they are not necessarily conducive to overall improved environmental outcomes. UNEP (2002) argues that in some cases farmers are likely to shift their production from previously subsidised polluting sectors to other polluting activities. For example, if EU eliminates export subsidies granted to meat producing units that tend to display significant negative environmental impacts, farmers might switch to higher-value outputs such as horticulture, which again puts upward pressure on natural resources as it requires large volumes of agro-chemical inputs.

Hence, the positive/negative net structural effect of trade liberalisation on a country's or region's environment will depend on the pollution intensity characteristics of the traded goods, sectors or industries that are affected (positively and negatively) by liberalisation.

3.4 Location Effects

Different structural effects in different countries may lead to the international transfer of production activities. Alpay (2003) argues that interactions between trade openness and environmental quality largely depend on country-specific factors and existing environmental institutional frameworks. The study mainly discusses the trade-environment nexus with reference to five country-specific factors: stage of economic development, comparative advantage and resource intensity of the traded product, environmental awareness, and the level of environmental policy implementation. For instance, if one investigates a developing country with a comparative advantage in pollution-intensive tradables, then freer trade might concentrate the production of such goods in the respective country, in particular if the level of environmental policy stringency is low. This effect is known in the literature as the "pollution haven" hypothesis and is an example of a distribution, location or composition effect through which trade and investment liberalisation might negatively affect the environment. In other words, higher pollution intensities might be attributed to a "pollution haven" effect if differences in industrial composition across countries are driven by environmental policy (Rösner, 2003). The distribution effect is combined in this case with the lack of harmonisation and integration of environmental measures into global and national trade reform policies. With reference to the latter issue, Alpay (2003) notes that harmonisation should not be set up as a one-to-one matching of policies, but adjusted to country specific factors such as pollution absorption capacity.

Nevertheless, the concern that trade liberalisation might promote the use of "pollution havens" is weakly grounded in empirical evidence. Most of the studies empirically investigating the hypothesis find no evidence of delocalisation in response to North-South regulatory environmental gap. Gallagher (1999) employs a simple partial equilibrium approach to quantitatively test the "pollution haven" hypothesis applied to the NAFTA regional trade agreement. The author investigates the effect of a specific trade policy change on the location of "clean" and "dirty" industry between Mexico and the United States. The study finds that the conclusion of NAFTA did not result in an increase in employment levels in dirty industries located in the developing country and Mexico did not become a pollution haven. A similar conclusion is reached by Gamper-Rabindran (2002) who also assesses changes in US-Mexican trade and Mexican output and air quality during the NAFTA transition. Using a regression analysis the author finds no strong evidence of the "pollution haven" distribution effect that import intensity grew in dirtier industries relative to cleaner ones. In addition, Gamper-Rabindran (2002) comments on the technology effect of trade liberalisation and notes that the conclusion of NAFTA led to a cut in tariff rates applied to pollution abatement equipment and an increase in the imports by Mexico of American pollution prevention technologies. Cole, Elliott and Azhar (2000) undertake a more detailed analysis of trade flows between developed and developing countries. The authors find some support for the pollution haven hypothesis but only for specific time periods and certain trade-pairs. Their study emphasises the importance of splitting the trade data sample into sub-periods suggesting that the concentration of dirty industries in developing countries with lax environmental regulations tends to be a temporary phenomenon. Furthermore, Grether and de Melo (2003) identify a new factor that tends to weaken the location effects of trade liberalisation on environmental outcome, namely the presence of high natural barriers to trade

in typically heavy polluting manufacturing industries. These impediments to trade are represented by larger elasticities of bilateral trade with respect to transportation costs typically characteristic of polluting industries. In other words, polluting sectors tend to produce intermediate inputs or heavy-weight commodities, for which proximity might matter more for location decisions than the presence of an environmental regulatory gap.

Ricupero (2002) points out that fears of conflicts between trade and environment have been exaggerated. He gives the examples of eco-dumping or unfair competition induced by lax environmental regulations, and argues that there is little empirical evidence to support these arguments. Xu (1999) empirically proves that the environmental factor is not a significant determinant of international competitiveness and, hence, eco-dumping is not an effective strategy to follow. The author employs regression estimation techniques and shows that environmental stringency has a negligible effect on international trade competitiveness. The fear that trade liberalisation might foster a shift of eco-dumping production activities to developing countries with lax environmental regulations seems to be empirically ill-founded.

3.5 Regulatory Effects and the Integration of Environmental (and Social) Considerations into Global Trade and Investment Institutions and Frameworks

Trade reforms have an increasing impact on environmental policies and regulations in the country liberalising its trade. An example is the EU's reform of its Common Agricultural Policy that seeks to transform its subsidising methodology of agricultural producers. The EU has diminished its export subsidies and intends to completely eliminate its direct income payment scheme that distorted production, and to replace these protectionist policies with farm payments that would promote quality, animal safety and welfare, and environmental conservation. Thus, EU's CAP might be seen as a case where trade reforms are strengthening the region's environmental policies and regulations. However, from a global and especially developing country point of view, the EU's shift in agricultural policy is merely seen as a strategy to continue subsidising its farmers. Shahin, 2002, for example, argues that the CAP reforms are an example of developed countries using environmental issues as "noble excuses" to safeguard and keep protecting their sensitive sectors. She views the issue of separating protectionism from the environment as a major challenge in promoting worldwide sustainable development. A pragmatic and workable solution to the trade and environment debate might be the creation of a multilateral rules-based system for the environment, a World Environmental Organisation that would represent the counterpart to the WTO and a strong environmental voice on a global scale (Esty and Ivanova, 2003, Shahin, 2002, Ruggiero, 1999). This would also please advocates of free trade as environmental problems could be tackled at their source (*i.e.* where the externalities arise), instead of supporting protectionism and building trade barriers on environmental grounds. Biermann (2002) also favours the establishment of a WEO that would serve environmental interests, in particular for developing countries. The author argues that such an independent high-level specialised agency would support particularly poorer countries in increasing their bargaining power vis-à-vis developed countries, whilst assisting the South in ensuring international assistance to tackle environmental problems that are often overlooked by globalisation and trade liberalisation measures. Nonetheless, the institutionalisation of a global consensus on environmental priorities faces substantial resistance by both developed countries and NGOs. The former believe that the WTO represents the most suitable instrument for policy makers, particularly in the environmental field due to its strong, established and effective dispute settlement mechanism, whilst the latter argue that existing trading systems should be amended to accommodate environmental concerns. In addition, a report published by UN University

(2002) calls for caution and careful consideration and evaluation of the costs and gains associated with any structural or procedural attempt to reorganise and centralise key MEAs. It argues that any effort to create a WEO should not “destroy the strengths of the existing system of international environmental governance” or “reduce the level of systemic fragmentation or MEA autonomy to the point where it hinders capacity for innovation”.

The ambitious goal of addressing environmental concerns through a separate multilateral institution would bring together governments, the private sector and civil society in a more effective dialogue on finding solutions to inequality and environmental threats induced by globalisation (Panayotou, 2000). In other words, as the author argues, a WEO would be more capable of challenging globalisation and integrating environmental and trade policies for equitable human development. This could better serve specifically the interest of developing countries who argue that trade reforms have done little to solve their deep developmental problems such as lack of administrative capacity, obsolete technology, low level of foreign investments and official assistance, limited access to Western markets and high levels of poverty (Gaines, 2002). The author emphasises that developed countries have given too much weight to trade-environment relationships and have not paid sufficient attention to the social impacts of globalisation. In other words, trade liberalisation has so far failed to promote sustainable development in particular in developing countries. Gaines (2002) concludes that the development needs of the poor have often been neglected in trade negotiations and that a more substantive policy triangulation of international trade, environmental protection and development needs to be adopted. This standpoint seems to be supported by recent evidence provided by FAO (2003) with reference to the impact of the implementation of the WTO’s AoA on market access. FAO (2003) reports that after an examination of 23 case studies, almost none of them were able to draw a clear connection between the AoA and export performance. In other words, improved market access to developed markets and the realisation of gains from trade liberalisation by developing countries remains a key objective in future trade negotiations.

3.6 Summary and Conclusions

The likely outcome of these cross-cutting effects of the relationship between trade liberalisation and environmental performance can be summarised as follows:

1. Scale effect: likely to be negative (increase in trade – decrease in environmental performance), assuming all other factors are kept constant;
2. Technology effect: likely to be positive if the new technology is less polluting than the replaced technology (increase in trade – increase in transfer of new less polluting technology between countries – increase in environmental performance);
3. Structural effect: ambiguous depending on the case under analysis;
4. Location effect: insufficient empirical evidence to support a consistent effect;
5. Regulatory effect: positive (increase in trade may stimulate the adoption of national environmental standards and the formation of international environmental agreements) but with limited implementation at the global level. A negative feedback effect on trade flows may occur as governments may be tempted to adopt trade protectionist measures by bringing forward environmental and health and safety arguments;

6. Current negative overall trends for global issues (*e.g.* climate change, biodiversity) are unlikely to be reduced by the effects of further trade liberalisation, and depend primarily on parallel multilateral action.

4. STRATEGIC PRIORITY AREAS

This section considers the implications of greater trade and investment liberalisation on sustainable development in terms of Defra's five strategic priorities: climate change and energy, natural resources protection, sustainable consumption and production, sustainable rural communities and a sustainable farming and food sector. Priority has been given to the first three of these areas. The fourth area, sustainable rural communities, has not been considered in depth for impacts in the EC, since many of the issues have been considered elsewhere, in relation to the CAP reform process. Corresponding issues for developing countries are included under the last of the topics, on sustainable farming and food sector.

4.1 Climate Change and Energy

The contribution of trade liberalisation to climate change occurs primarily through the scale effect discussed previously in the report. From a theoretical standpoint, it has been argued that there is an inverted U-shaped relationship between the level of environmental pollution (in particular, GHG emissions) and income per capita. However, the empirical literature fails to provide any clear findings to confirm that income growth might be sufficient to reverse air pollution (see above)). Furthermore, it is difficult to isolate a "pure" scale effect on climate change reflected by the commonly assumed inverse relationship between growth in economic activity and improvement in air quality. In other words, growth in economic activity may be compatible with both a decrease and an increase in polluting emissions depending on the other driving forces that are likely to emerge from and interact with increased levels of trade and production (Morita and Robinson, 2001, in IPCC, 2001). This is because even if increased economic activity would first tend to put more pressure on the environment, other dampening factors fostered by policy, lifestyle choices or technological development might come into play, possibly contributing to an overall net reduction in emissions. Morita and Robinson (2001) identify factors associated with processes such as "efficiency improvements, energy conservation, shifts to alternative fuels, and shifts to post-industrial economic structures".

Nonetheless, the potential of technological developments to contribute to the reduction of GHG depends in turn on the existent opportunities of overcoming barriers that hamper their diffusion and the extent to which more polluting technologies are favoured by trade liberalisation and globalisation forces (Sathaye and Bouille, 2001). The authors hence emphasise the need for more research to investigate to what extent market globalisation might support less GHG intensive technologies with positive consequences for improvements in air quality and climate change. Srivastava and Dadhich (1999) discuss a more specific issue brought about by globalisation and its relationship with the diffusion of less polluting technologies, namely the role of transnational corporations (TNCs). Whilst the authors highlight the benefits that TNCs might bring to developing countries through a supply of scarce capital, transfers of modern technologies and management know-how, they also point to the potential negative effects not only on host countries but also on the global environment. Such concerns are mainly associated with likely conflicts of interest between TNCs and host

economies. TNCs may display little long-term commitment to their host economy and its environmental objectives. The authors conclude that in order to reduce TNC activities that are detrimental to the environment and the socio-economic development of poorer countries, it is essential that TNC activities be better regulated and that both the positive and negative role of TNCs be accounted for when designing future agreements on climate change.

International action to reduce levels of GHG emissions depends largely on ratification of the Kyoto protocol. Brack and Gray (2003) have noted that 'the Kyoto Protocol on climate change, when it comes into force, will, of course, affect a far greater share of global economic activity than all the other MEAs put together; though others, like the Basel Convention or the Cartagena Protocol, affect not-insignificant volumes of activity'. In the UK Government's Framework for Sustainable Consumption and Production, DEFRA has noted that 'we have a reasonably robust understanding of what is required to stabilise concentrations of greenhouse gases in the atmosphere' (DEFRA 2003), as applied through the UK's emission reduction targets in accordance with the Kyoto protocol.

Alpay (2003) has reviewed research on the relationship between trade flows and delays in ratification of the Kyoto protocol under United Nations Framework Convention on Climate Change, with particular reference to the impact of openness to international trade on the ratification process. Empirical tests are very limited, with mixed evidence that trade matters for the ratification. Whereas total exports have a positive effect on the speed of ratification, total imports have a negative impact on the speed of that process.

While much of the scale effect arises through transport and other increases in energy demands, trade liberalisation in the agricultural sector may also have significant effects on climate change, through its influence on growth of the livestock sector. Rae and Strutt (2003) report that the contribution of livestock to global climate change has been estimated at between 5% and 10%.

4.2 Natural Resource Protection

Forestry

The primary consideration within the literature dealing with liberalisation of trade in the forestry/forestry products sector is whether liberalisation will lead to changes in land use, thus leading to an increase in deforestation. Some of the studies also consider whether there are other social and environmental impacts as a result of liberalisation in this sector. The majority of the studies consider these questions in relation to the different forestry protection and management regimes already in existence. The main documents used in the literature review are Guerrero *et al.* (2000) and Sizer *et al.* (1999) supplemented by Ferrantino (1999), Brown (2000), Tallontire and Blowfield (2000), USTR (1999) and Barbier (2000).

Most of the studies have concentrated on identifying potential environmental consequences as a result of liberalisation in the forestry sector. They have mainly concentrated on the impacts within the producing countries and have considered the effects of both forestry and forestry products. These include; logging operations, sawmills, manufacturing of particle-board, plywood, moulding, wood crates, consumer and industrial pulp and paper products (Guerrero *et al.*, 2000).

Economic effects are examined in a fairly preliminary manner. The data provided relate to imports, exports and existing tariffs for forestry and forest related products, and attempts are made to link economic changes to trade liberalisation. Similarly the social effects are not well covered in the studies with the exception of Guerrero *et al.* (2000), who provide a detailed analysis of the effects of liberalisation under the NAFTA Agreement on the indigenous forest *ejidos*. A number of the reports studied (Guerrero *et al.*, 2000; Sizer *et al.*, 1999; and Barbier, 2000) provide a brief consideration of the indirect effects of trade liberalisation in the forestry sector.

The majority of the studies reviewed draw heavily on data from government documents, literature reviews and direct case study experience (*e.g.* COSYDDHAC's work with indigenous Tarahumara forestry *ejidos* in Chihuahua, Guerrero *et al.*, 2000). The study by Guerrero *et al.* (2000) applies the CEC's Final Analytic Framework for Assessing the Environmental Effects of NAFTA to the forestry and forestry products sectors in the State of Chihuahua, Mexico. Ferrantino (1999) concludes that CGE models with forest submodels are potentially useful for analysing the effects of trade policy on deforestation. Two simulation models, the Global Forest Products Model (GFPM) and the CINTRAFOR Global Trade Model (CGTM), are used by USTR in their study of the economic and environmental effects of accelerated tariff liberalisation in the forest products sector.

Trade is identified as an important instrument influencing land use. However, it is not considered to be the only factor causing deforestation. Other causes of deforestation and forest degradation include population increase, migration, land tenure provisions, forest products trade, fuelwood demand, corruption, infrastructure development and government policies including provision of subsidies (Brown, 2000). Ferrantino (1999) illustrates how trade affects land use by identifying the following chain of causality:

"Trade liberalisation changes prices of traded goods relative to each other. It also changes the price of factors of production, the prices of non-traded goods and also changes real incomes. Price changes in turn influence the production, consumption and investment decisions of agricultural households. One of these decisions is how much land to clear. Price and income changes may affect the behaviour of commercial logging operations, which in most countries is secondary but still has an impact on land clearing."

A number of studies suggest there will only be a very small increase in world timber harvest levels as a result of liberalisation and that it is unlikely to alter the proportion of the harvest coming from developing countries, as current tariffs are generally quite low (USTR, 1999; Sizer *et al.*, 1999). However, Sizer *et al.* (1999) note that elimination of low tariffs might have a larger than expected impact in highly competitive markets with low profit margins. In addition, the study by Guerrero *et al.* (2000) shows that wood production has increased substantially in Chihuahua since Mexico's entry into NAFTA. This has been accompanied by an increase in exports of wood and wood products from Mexico and an increase in imports from the USA.

A small number of countries account for the bulk of the imports and exports of forest products. Countries that would benefit most from tariff reductions are those that currently dominate world export markets. There are significant benefits to be gained in terms of trade expansion, enhanced competitiveness and efficiency within these producer countries. However, without adequate enforcement of environmental protection policies and the

incorporation of social safeguards, a range of negative impacts could be experienced (Sizer, 1999).

Guerrero *et al.* (2000) provide evidence on the occurrence of some of these negative effects. Chihuahua producers are under pressure to keep product prices low in order to maintain their share of the Mexican market. This has resulted in pressure on the producers to oppose environmental regulations as these regulations increase costs of production. Over the last few years large numbers of citizen complaints have been filed about illegal cutting and other unsustainable forestry practices. At the same time, the traditional socio-economic structure, which enables a few powerful leaders to profit but the majority of *ejido* residents to receive very little, has persisted and adapted to the new situation. In addition, Barbier (2000), using case study evidence from Mexico and Ghana, indicates that both direct and indirect rural resource degradation effects have resulted from liberalisation. On the other hand, the assessment of the environmental and economic effects of accelerated tariff liberalisation (ATL) in the forest products sector (USTR, 1999) states that, 'environmental effects are likely to be mixed (both positive and negative) and small. For the US the ATL's environmental impacts on US forests are expected to be indistinguishable compared to what would be the case in the absence of the ATL'. Economic effects are also predicted to be indistinguishable. Scriciu (2003) also finds, by employing regression analysis, inconclusive results regarding the ability of macroeconomic forces such as economic development and increased trade to empirically and systematically explain their contribution to tropical deforestation at a global level.

Many restrictions, standards, regulations, requirements (e.g., for labelling, recycling and recovery) and financial support measures (e.g., subsidies and tax breaks) are applied in the forestry sector. Some of these non-tariff measures are designed to protect domestic industries from foreign competition. However, many have specific non-trade related objectives such as environmental protection. Concern is raised that eliminating these non-tariff measures may have significant negative consequences (Sizer *et al.*, 1999). This is supported by Guerrero *et al.* (2000), who state that:

'NAFTA's provisions regarding non-tariff trade barriers, particularly rules for adopting product standards and for government purchasing programmes, could adversely affect the sustainable production of wood and wood products in Mexico depending on how these rules are interpreted and applied'.

On a similar note, the potential impact of free trade on ethical trading has been considered by Tallontire and Blowfield (2000). The two types of ethical trade in operation in the forest sector are trade in timber from certified forests and various fair trade and conservation driven trade schemes focussing on products derived from nuts, honey and other non-timber forest products. The authors conclude that the growth of ethical trade should not be prevented as long as steps are taken to ensure that such schemes do not impede trade and are inclusive.

The main limitation in this group of studies is that there is a lack of combined, systematic consideration of all of the environmental, social and economic impacts of liberalisation in the forestry sector. No single study addresses all three sets of impacts adequately. However, taking the studies as a group, it is possible to obtain evidence of some of the impacts within each of these three elements.

An overall economic benefit is predicted in a number of studies but this is likely to be concentrated in the few main producing areas, which dominate the export market. Evidence from Guerrero *et al.* (2000) suggests that the social impact of liberalisation in a developing country situation has been negative as the pressure to keep prices down in combination with a lack of social and environmental safeguards has led to increased illegal logging and the persistence of corrupt social practices. In terms of the environmental impacts, a causal link between liberalisation and deforestation has been identified and potential risks to biodiversity, soil erosion and water quality have been highlighted. However, it is recognised that more information is required to determine, more certainly, the actual and potential effects of increased forestry production.

A number of studies recognise that international trade, in itself, is not directly a threat to forests and that it can even provide incentives for responsible management and more efficient practices (USTR, 1999; Sizer *et al.* 1999) However, the findings of the majority of the studies do not support an unambiguous ‘win-win’ situation, while recognising that a potential ‘win-win’ outcome is possible if appropriate mitigatory measures providing adequate environmental and social safeguards, are put in place and made to work.

Fisheries

The main focus of the literature reviewed is on the interface between trade liberalisation, conservation, and sustainable development. Trade-related conservation measures include the regulation of fisheries products to promote sustainable harvesting, the implementation of international and multilateral agreements that authorise the use of trade measures to promote sustainable fishing practices, the elimination of subsidies that promote overfishing and other environmentally harmful practices, and the regulation of foreign access to fisheries to implement sustainable fisheries requirements (Bache *et al.*, 2001). In terms of value, more than half of total world fishery exports originate in developing countries, and fish exports account for a significant share of total merchandise exports for many low-income countries (FAO, 1999). However, international trade in fish and fish products can also generate significant environmental and social costs, with overfishing creating problems of stock depletion and threatening the livelihoods of fishing communities. The main documents used in the literature review are Deere (2000), OECD (2000a), MRAG (2000), Allison (2001), Page (1999b), Page *et al.* (2000), Bache *et al.* (2001).

Trade in fish and fish products is closely linked to environmental issues relating to the management of world fish stocks. This is reflected in many of the studies reviewed, where trade *per se* is not discussed, but rather as part of a package of measures (including quotas and subsidies) which, taken together, may have significant environmental and social impacts. A range of approaches is used in the literature to identify the economic, environmental and social impacts of trade liberalisation and related measures in the fishery sector, but few of the studies use a clearly defined methodology for assessing impacts. Some studies have used a modelling approach (*e.g.* OECD, 2000a) to consider the economic and environmental impacts of a change in fishery management policy, but no study has systematically looked at all the elements referred to in Figure 1. The data used in the studies are drawn mainly from international (principally FAO) and national sources, with a limited amount of primary data from case studies. Establishing the economic and environmental consequences of international trade in fish and fish products is complicated, however, by incomplete and inaccurate data on fish stocks and trade flows.

The Uruguay Round proposed various tariff reductions for fish, including the halving of EU import duties for white fish and the elimination of US tariffs on most types of frozen fish and fillets. These tariff reduction proposals were additional to the 33 per cent across the board reductions for non-agricultural products. The actual results have been mixed, with considerable variation in the reductions in fisheries tariffs implemented by different countries. Developing country exports continue to face high effective tariffs of between 12 and 22 per cent in OECD countries (Page *et al.*, 2000), although fish imports into the EU from ACP countries have preferential tariff treatment. Non-tariff barriers to fish and fish products include health regulations, quotas, reference prices and seasonal controls.

There is widespread international concern about the overall decline in world fish stocks – “by all account, the world’s fisheries resources continue to undergo an alarming deterioration, whereby the extent of annual harvesting world-wide is undermining the sustainability of fisheries resources” (WTO, 1997a). Overexploitation of fish stocks has negative environmental, economic and social consequences. On the environmental side, heavy fishing can affect genetic diversity of fish stocks and the future regenerative capacity of the fishery. Declining stocks of commercial fish for direct human consumption can threaten food security and nutrition levels in developing countries, particularly in coastal areas and among the poor where fish is a staple food.

The international fisheries crisis is related to the significant level of subsidisation of the fisheries industry, particularly in OECD countries. Subsidies to fisheries alter the incentive structure faced by participants in the sector. Production subsidies have led to increased investment and capacity, and have allowed fisheries to operate at an economic loss, thereby encouraging overfishing with the consequential negative environmental impacts. Subsidies (or transfer payments) to the fishing industry take a number of forms: transfers in the form of direct payments to fishers, cost reducing transfers and general services (OECD, 2000a: 129). An additional form of subsidy is market price support, normally created by trade restrictions, which allow the domestic price to be greater than the world price. OECD countries spend large sums of money on subsidies to the fisheries sector: the total level of subsidies (excluding market price support) in 1997 was equivalent to 17 per cent of the landed value of marine capture fishery products (OECD, 2000a: 131). While the payment of subsidies to fisheries is only one of several factors that can contribute to overfishing and stock declines, there is evidence to suggest that transfers have contributed to overcapacity in fishing fleets, and a shift of subsidised fishing fleets into third-country waters (OECD, 2000a; MRAG, 2000).

The empirical literature typically does not consider the impact of a reduction in fishery tariffs separately from reform of other fishery measures. It has been argued that high levels of effective protection resulting from tariff escalation cause economic inefficiencies and environmental costs, through the over-use of fisheries resources in the protected markets, but no empirical evidence is reported to support this argument (Deere, 2000: 48; WTO, 1997a: 26).

The economic, social and environmental impacts of adopting a “more responsible” fisheries policy are examined in OECD (2000a). Drawing on modelling and less formal studies for the major OECD fishing sectors, the study demonstrates that a move to a “maximum sustainable yield” level of harvesting *might* generate higher and more sustainable yields, with consequential positive economic, environmental and social impacts. If stocks are allowed to rebuild, then *after a transition period*, yields and income *may* increase above current levels. In this case, support industries would also benefit economically, and social gains will accrue to

poorer communities through a reduction in risk and vulnerability of household incomes. The environmental gains would be realised through the move to a sustainable level of extraction. It is also possible and perhaps more likely, however, that the long-run sustainable equilibrium will be below the current level of extraction, in which case the environmental gain will be accompanied by negative economic and social impacts. Also, if only part of the international market is controlled, the removal of subsidies in the controlled segment of the market may lead to an expansion in fishing activity in the uncontrolled segment.

In considering the impact of subsidies reduction, it is important to recognise that the removal of certain forms of subsidies may not always have positive impacts. Subsidies can be classified as positive and negative (Bache *et al.*, 2001: 24). In terms of fisheries, positive subsidies include those directed towards reducing capacity, and are used to defend, for example, subsidies for the decommissioning fishing vessels and retraining of fishers. The positive environmental impacts may not arise however, in the absence of a parallel set of measures to ensure that an increase in effort does not occur in either the controlled or uncontrolled markets. Other studies that discuss the potential for significant environmental benefits through the removal of subsidies include OECD (1999a), Porter (1998), Dommen (1999), IIEP (2002), OECD (2003a), UNEP (2001a), and UNEP (2001b).

To summarise, trade liberalisation will not lead to ‘win-win’ outcomes in fisheries, when other major components of an effective fisheries policy are not in place. These measures would include effective monitoring of quantitative controls, removal of subsidies, and redistribution measures, for social reasons, during the adjustment period.

4.3 Sustainable Consumption and Production

The UK Government defines the core of Sustainable Consumption and Production as ‘continuous economic and social progress that respects the limits of the Earth’s ecosystems, and meets the needs and aspirations of everyone for a better quality of life, now and for future generations to come’ (DEFRA, 2003: 10). Given that there are limits to the capacity of the global ecosystem to absorb pollution and provide natural resources, the only way to maintain economic progress in the long term without approaching these limits is to decouple economic growth from environmental degradation. In practice this means more efficient production using less raw materials, less waste and pollution in the production process and less energy, water or waste in meeting consumer needs. Given the definition of sustainable consumption and production in terms of decoupling economic growth from environmental degradation, the discussion of the impact of trade liberalisation on SCP inevitably cuts across most of the topics discussed in this report. We therefore confine the discussion in this section to those aspects of SCP that are not dealt with elsewhere in the report.

Trade Liberalisation and Environmental Services

There has been a significant expansion in the market for environmental goods and services to remedy and prevent problems of water pollution, waste treatment, air pollution, habitat protection, and sustainable resource use (OECD/Eurostat 1999; UNCTAD, 1998). The WTO Secretariat estimates that the international trade in services, of all kinds, now constitutes over a third of total international trade, and has been the fastest growing sector of world trade (Andrew, 2000). Within the service sector, trade in environmental services is becoming increasingly important and some consider it offers the potential for a ‘win-win’ outcome from further trade liberalisation. The main documents used in this literature review, of trade

liberalisation in the environmental services sector, are OECD (2000b), supplemented by, Andrew (2000), OECD (1999b), OECD (1998), OECD/Eurostat (1999), UNCTAD (1998), WTO (1998) and WTO (1997b).

The OECD (2000b) study on 'Environmental Goods and Services: An Assessment of the Environmental, Economic and Development Benefits of Further Global Trade Liberalisation' was prepared for the OECD Joint Working Party on Trade and Environment. This was to develop a framework for future trade liberalisation efforts in the environmental goods and services sector, including the role of complementary policy measures. It is a consolidated report arising from a series of five papers, two of which are referred to in this case study (OECD, 1999b and OECD, 1998).

The study examines the likely environmental, economic and development benefits of trade liberalisation in this sector. It then goes on to look at case examples of 'win-win' situations accruing to developing countries from liberalisation of their environmental services markets (OECD, 2000b). The case studies investigated only include examples in the water supply, wastewater treatment and solid waste management sub-sectors which is just a part of the environmental services sector. The reasons for only considering these sub-sectors are given as: the fact that they represent the immediate environmental services priorities for most developing countries; they are the most demanding in terms of financial resources; they are the leading areas of privatisation or part privatisation initiatives in the environmental sector; and much more information is readily available for the water and waste sub-sectors. However, it is recognised that there are additional cases to be examined in other environmental media.

The likely environmental consequences of trade liberalisation in the environmental services sector are covered in the OECD (2000b) report. However, the review is limited to beneficial environmental effects. Andrew (2000: 22-3) refers to a recent investigation by UNEP, which identifies potential negative environmental effects. These include increased energy consumption for waste and water treatment and soil, water and air pollution from waste disposal sites. In addition, the report by UNCTAD (1998) notes that trade in environmental services may be adversely affected by lack of market access in other sectors, and liberalisation would therefore need to be extended to several sectors to be effective.

The economic effects of trade liberalisation in the environmental services sector are also covered in the OECD report but, again, the focus is on specific examples of economic and development benefits. However, there is some consideration of the potential economic difficulties covered in the discussion on implementation challenges. Social effects of liberalisation are not mentioned explicitly and are only covered indirectly in the OECD study. The social effects of liberalisation are briefly considered in the WTO paper (1997b), where the costs associated with labour displacement, the depreciation of skills, the need for professional re-training and, possibly regional relocation are noted. However, the direct social consequences of trade liberalisation are considered to be less serious in many service sectors than in other sectors such as mining, manufacture or agriculture.

The OECD study identifies a number of potential or actual 'win-win' outcomes for developing countries from trade and investment liberalisation in the provision of water and waste management services. From the examination of the case studies it identifies specific examples of potential environmental benefits as:

- Clean water and waste collection services delivered to greater numbers of citizens, leading to healthier human environments;
- Reductions in the wastage of, and/or inequitable access to, scarce water resources (e.g. through leaks and ease of bypass/siphoning associated with old/inadequate pipe infrastructure);
- Increased availability of drinking water from the introduction of recycling of effluent water for industrial use;
- Use of waste recycling to create alternative sources of energy;
- In-country presence of foreign firms creates increased opportunities for environmental management education and training, and skills transfer, to other commercial sectors, both for the water and waste media and other environmental services;
- Availability of a larger choice of environmental technologies addressing the environmental problems more appropriately for the country in question which can often mean a move away from end-of-pipe solutions to preventive ones;
- Reinvestment of a share of profits in research and development of new environmental technologies and skills, environmental infrastructure upgrades and new environmental investments.

The study also identifies the following potential economic and development benefits based on the case studies investigated. However, it is noticeable that there is no *direct* reference to the social effects of liberalisation:

- Relief of pressure on government budgets, including at state and municipal levels. Savings may be reallocated to environmental policy, inspection and enforcement budgets, to other social services, or to the overall budget balance.
- The creation of skilled and unskilled jobs for local workers, in design, construction and long term operation of the facilities.
- The provision of water and waste management systems attracts foreign and local investment to the community, bringing more jobs, stable economic growth and an increased local tax base;
- Local private sector partners extend their experience in large and/or very specialised projects which are then exported to other countries with similar needs and operating conditions;
- Build-operate-transfer operations revert to local ownership at a specified time, and include significant environmental resources and sources of jobs, which continue into the future.

The study briefly considers the potential ‘losers’ from trade liberalisation in the environmental services sector and these are identified as:

- Consumers may be faced with new or higher fees.
- Local entrepreneurs who currently make a living from garbage collection and sorting, or from siphoning off water from old pipeworks.
- Loss of employment within existing service providers.
- Loss of subsidies to existing monopoly utilities which means that they are unable to compete with new providers.

The development of a framework of complementary measures to support trade liberalisation in the environmental services sector is recommended. It is suggested that this should include:

- i) Strengthening the environmental regulatory framework and choice of environmental policy instruments to be used.
- ii) Emphasising the growing importance of environmental software or services when selecting environmental hardware or equipment and other goods.
- iii) Reflecting the evolution in the kind of environmental hardware demanded, from end-of-pipe technologies and add-on equipment to production systems embodying pollution prevention approaches.
- iv) Distinguishing the needs for environmental services in developing countries from those in developed countries.

A considerable number of examples of potential or actual positive outcomes have been identified (OECD, 2000b; OECD, 1999b). However, the studies failed to examine, sufficiently fully and systematically, the negative impacts of trade liberalisation in environmental services, particularly relating to social impacts, and to present an overall, balanced analysis of likely 'win-win' outcomes. There are no detailed mitigatory measures proposed in order to offset potential negative effects beyond stating that: "careful design and implementation of market-opening strategies can address most of the potential concerns" (OECD, 2000b).

The studies point to the 'strong potential for a 'win-win' situation from the trade liberalisation in environmental services', and emphasise that the 'environmental services sector is directly involved in the delivery of improved environmental performance, environmental protection and sustainable resource use'. However, there are significant potential negative impacts, which may occur within developed and developing countries. The consideration of these potential impacts would need to be built into the analysis before this 'strong potential' can be verified. In addition, the key conclusion from the OECD (2000b) study is that in order for the potential 'win-win' situation to be realised, liberalisation needs to be accompanied with complementary measures. Although the studies investigated provide valuable background support for the potential for an overall 'win-win' outcome, further detailed case study analysis is required in order to substantiate these findings.

Water and Wastewater Services

The potential impacts on sustainable development of trade liberalisation in water and wastewater and solid waste management services have been assessed as part of the EC's SIA of WTO Negotiations programme (Bisset *et al*, 2003). The report argues that the liberalisation effects will result mainly from mode 3 and mode 4, liberalisation under the General Agreement on Trade in Services (GATS), where private sector investment and management expertise would participate in the water and waste management sectors in the liberalising markets, particularly in developing countries.

Foreign direct investment flows, particularly to developing countries, depend mainly on general domestic market conditions and the investment 'climate', rather than on the level of protection. The impact of environmental services trade liberalisation on foreign direct investment inflows is likely to be more significant, therefore, when accompanied by domestic market policy reform, including regulatory capacity strengthening. However, where an increase in foreign private sector involvement does occur as a result of trade liberalisation, there are likely to be significant gains for the multinational enterprises from OECD countries that supply environmental services. There are also potential gains for the host developing countries, in terms of economic, social and environmental improvement. But to realise these potential benefits requires an effective regulatory institutional framework, which can control

anti-competitive behaviour, safeguard the public interest, and achieve social objectives in terms of poverty alleviation and equity. Where these regulatory frameworks are absent or ineffective, the gains will be much less likely to be achieved, and outcomes for sustainable development will be more uncertain.

A number of flanking measures are considered as necessary conditions for ensuring an outcome that is supportive of the goal of sustainable development (Kirkpatrick and Parker, 2004). These are: improving transparency and clarity of WTO rules relating to GATS liberalisation; implementing complementary domestic market development policy measures; strengthening regulatory capacity; and improving international institutional policy coherence and support for the Millennium Development Goals of poverty reduction in development.

Industry Studies: South and East Mediterranean Region

This set of case studies was co-ordinated by Friends of the Earth Middle East under the sponsorship of USAID, to assess the potential impacts of the Euro-Mediterranean Partnership between the European Union and ten countries of South and East Mediterranean. The prime aim of the study was to contribute to a better understanding of potential environmental effects of the free trade zone, and to suggest policy recommendations to avoid or minimise adverse impacts. Environmental issues were the principal consideration, but some social factors were considered in the context of a broad sustainable development framework.

The studies included analysis of primary macro and micro-level economic data, the use of empirical data from secondary sources, industry interviews, analysis of government objectives and forecasts in relation to the free trade area, identification of existing environmental effects, and extrapolations based on anticipated trade changes.

The Egyptian study made use of the textile industry's own forecasts of production changes, plus interviews and a literature review. Environmental data and evaluation of existing environmental protection mechanisms were taken from published reports, including the UK government's SEAM project. The industry's ability to respond to environmental pressures was evaluated on the basis of interviews with textile companies.

The study of the Jordan phosphate industry, which is primarily government owned, made use of the government's own policies for the development of the industry, and analysis of current inward investment initiatives. Environmental data were taken from secondary sources, and extrapolations were made on the basis of anticipated changes in the nature and volume of production.

The principal environmental impacts from the textile sector in Egypt are water consumption, wastewater effluent and air pollution. Prices of inputs such as water and electricity do not reflect environmental costs, so that increased production may exacerbate over-use. Equipment used in the sector is old and inefficient. Without improvement, expansion of the industry may lead to increased resource consumption and pollution. Most of the producers in the sector are small or medium sized enterprises. Working and social conditions of the workforce are poor, although working conditions for international markets are generally better than for the local market. These SMEs lack the financial capital and technical knowledge to take advantage of environmental market niches provided by eco-labels or environmental management systems such as ISO 14000, which the free trade area might provide. With appropriate support,

modernisation of the industry could play a potentially beneficial role in some aspects of both social and environmental conditions.

The phosphate sector in Jordan currently extracts water beyond sustainable limits, and is a major consumer of electricity. Air pollution from particulates, pollution of groundwater and damage to corals in the Gulf of Aqaba due to marine transport are identified as significant impacts. The Euro-Med Partnership is expected to contribute to a planned expansion of phosphate mining by up to 67 per cent over the coming decade. Given a lack of internalisation of environmental costs and weak environmental regulation, the planned expansion of production is predicted to exacerbate current negative environmental impacts, especially in terms of exploitation of water resources and energy consumption.

The comparative law analysis found that even when framework legislation exists, the necessary by-laws, standards, and supporting agencies necessary for enforcement of the laws do not. It is anticipated that this could result in development without appropriate environmental protection initiatives. Furthermore, it is suggested that the legal gaps between the EU and partner countries could encourage accelerated development of highly polluting industries and possibly the relocation of such industries to partner countries.

Most of the policy measures recommended by the study call for further investigation, monitoring, and strengthened decision-making mechanisms. This is consistent with the somewhat speculative nature of the findings. As the study itself points out, several of the recommended measures for environmental supervision of the Euro-Mediterranean Partnership are broadly similar to those adopted for the North American Free Trade Agreement, and also to those adopted by the EU for managing the environmental impacts of its own internal market reforms.

A number of potential ‘win-win’ outcomes are identified by the study, along with potential barriers to them being achieved. In the Egyptian textile sector for example, environmental improvements may be achievable in parallel with economic growth, if the response to trade opportunities includes significant modernisation of the industry. ‘Win-win’ outcomes are less likely in other aspects of the expected effects of the free trade area for which modernisation offers smaller environmental benefits. In such cases the study’s recommendations seek to avoid or minimise potentially adverse impacts.

FDI and the Environment

Studies of the ‘*pollution haven*’ thesis generally show little evidence that it is a significant factor in multinational corporations’ choice of location. Research conducted by the US government has indicated that environmental protection costs have sometimes been a factor in industry relocation, but studies by the Mexican government of the affects of NAFTA suggest that foreign corporations have better environmental and safety records than domestic firms (Grossman 2002).

Other studies have shown that, overall, environmental protection costs are rarely a major factor in international companies’ relocation decisions (van Liemt 2001).

For most corporations, environmental costs are only one of many factors in their choice of location. In manufacturing, the cost of environmental control is typically 2 to 3 per cent of total costs, although it can be much higher in particular sectors, such as aluminium or cement

manufacture (UNEP/IISD 2000). Even there, modern clean technologies, which do not waste their raw materials, may be more efficient economically as well as environmentally, so a company's choice of location may be irrelevant to its environmental performance. Multinational corporations can have a beneficial effect through introducing environmentally efficient manufacturing techniques and management systems. However, where production takes place in small-scale operations its environmental impacts are strongly dependent on national regulation. Also, this does not apply so strongly for commodities. Here, economic and environmental efficiency may be less closely aligned, and consumer pressures to maintain environmental standards overseas may have less effect.

It has been argued that a reduction in *tariff escalation* will have environmental benefits for developing countries, by shifting production away from production of highly polluting raw materials to higher levels of processing. A review of the evidence has shown the effect to be negligible (Hecht 1997).

Sustainable Consumption

Consumption has been an important issue in international policy since the Brundtland Commission in the early 1970s, which stated that 'it is simply impossible for the world as a whole to sustain a Western level of consumption for all'. Robins (1999) suggests five main reasons for the need to address the issue of sustainable consumption:

- environmental damage: the use and disposal of goods and services is a source of serious environmental problems, with the growth in car use and solid waste being perhaps the most pronounced
- poverty and inequality: the growing gulf in consumption standards within and between countries makes meeting needs and eliminating poverty central to the goal of sustainable development
- quality of life; rising pressure for conspicuous consumption can have damaging social and psychological effects, and there is a growing recognition that beyond a certain threshold there is no necessary link between growing consumption and quality of life
- economic efficiency: traditional approaches to meeting needs have tended to stress expanding supply: this has often been to the detriment of more cost-effective and resource conserving action in the consumption phase
- health: current consumption patterns also lead to damage to human health, with air and water pollution being major causes of premature death and illness.

It has proved difficult, however, to achieve consensus on a precise definition of sustainable consumption, with differences tending to evolve around the question of whether sustainable consumption means consuming differently, consuming responsibly or consuming less. The closest to a consensus definition is provided by UNEP (1999): 'sustainable consumption is not about consuming less, it is about consuming differently, consuming efficiently, and having an improved quality of life'.

This broad definition of sustainable consumption allows the focus to be placed on either sustainable production, or sustainable consumption patterns, or a combination of both (Jackson and Michaelis, 2003). In the context of trade and investment liberalisation, the key issue is therefore, the impact which liberalisation can have in changing production and consumption patterns in ways that improve the quality of life in its economic, environmental and social dimensions. The challenge of sustainable consumption is little different, therefore,

to that of sustainable development, and the findings in this report on the effects of trade and liberalisation on sustainable development are equally relevant and applicable to assessing the potential impact of liberalisation on sustainable consumption.

4.4 Sustainable Rural Communities

This area of Defra's strategic priorities relates primarily to impacts within the EU. In this area the impacts of trade liberalisation are closely related to reform of the CAP, which has been extensively studied elsewhere (see for example Colman and Roberts 1997, Potter *et al* 1999, EC 2000, EC 2001, CEP II 2001).

In relation to developing countries, the effects are covered in the following section on the agricultural sector.

4.5 A Sustainable Farming and Food Sector

Impact of Trade Liberalisation on Agriculture

The main documents used in the review were OECD (2000c), Ervin (1999, 2000), FAO (1999a). Modelling studies have been used to estimate the economic welfare impacts (Hertel, 1997; Hertel *et al.*, 1999, Hockman and Anderson, 2000; Matthews, 2000). Some of the environmental impacts of trade liberalisation have also been estimated using the modelling approach (Anderson and Strutt, 1996; Dean, 1999; Ervin, 2000; OECD, 2000c). The most commonly used approach has been to assume a functional relationship between the outputs of particular activities and environmental externalities, using information from ecological or biological systems modelling to link output changes to environmental impact. For example, OECD's *Ag-link* commodity market analysis and the *Agric-environmental indicators* database have been linked to derive quantitative estimates of the impact of trade liberalisation on the environment (OECD, 2000c; OECD, 2001). The study notes, however, that "the numerical results have to be interpreted with care, since the relationship between agriculture, trade and the environment is complex, depending on such location-specific and often scientifically not fully explored factors like the assimilative capacity of the natural environment" (OECD, 2000c: 10).

Modelling approaches to estimating the social impact of agricultural trade liberalisation have been confined mainly to the impact on national food security levels in low income, food import-dependent developing countries (Stevens *et al.*, 1999; FAO, 1999a).

Ex post empirical studies of the consequences of trade liberalisation in agriculture are less common. The studies that have been undertaken have focused on impacts at the household or community level (Oxfam, 2000; Wiggins *et al.*, 1999). The more disaggregated level of analysis used in empirical case studies can give rise to a tension between the impact outcomes revealed by empirical studies and modelling studies of the same policy measure, with the modelling approach predicting overall positive impacts and the empirical studies revealing negative impacts (Winters and McCulloch, 2000).

A reduction in the barriers to agricultural trade is likely to have positive and negative impacts on the environment. The direction and magnitude of these changes will depend on the trade liberalisation-induced producer responses and resultant changes in agricultural production

patterns, the state of the environment, and the environmental regulations and policies in place. Environmental impacts will vary, therefore, between countries, regions and locations.

The impacts will occur at both international and domestic level. The direction and magnitude of some of these environmental impacts are estimated by combining results on the commodity market impacts of agricultural trade liberalisation, with agri-environmental indicators (OECD, 2000c). The OECD study estimates a significant increase in methane emissions at the international level. With respect to domestic environmental impacts, the quantitative analysis suggests that environmental gains would accrue from a fall in agricultural prices and production intensity, with reduced levels of fertiliser and pesticide application, but the impact on other environmental indicators (biodiversity, soil and food protection, landscape) is uncertain. The impact on marginal agricultural land is not explicitly considered.

The environmental consequences of trade liberalisation for developing countries will also "... depend on the decisions about intensification and extensification that farmers make across the natural resource base. These decisions depend directly on the incentives and disincentives created by agri-environmental policies" (Ervin, 1999: 69). *A priori*, developing countries can be expected to experience greater environmental risk than developed countries from any given production expansion resulting from trade liberalisation. Production is likely to increase by extension into marginal land, and by increased application of fertiliser and pesticides. Regulatory frameworks will typically be weak. This general prediction is borne out by case study evidence. The expansion of horticultural exports from Kenya, for example, as a result of improved market access to the EU, significantly increased the negative environmental impact (Markandya *et al.*, 1999).

The environmental impact of agricultural trade measures can also affect developing countries through the growing concern over food safety and health issues. Sanitary and phytosanitary standards can act as barriers to market access, although attempts have been made to limit the trade restricting effects of sanitary and phytosanitary (SPS) measures and technical requirements through the WTO SPS Agreement and Technical Barriers to Trade (TBT) Agreement. Concerns over environmental standards also arise in relation to process and production method (PPM) standards, which stipulate how goods should be produced. Furthermore, Article XX of GATT provides for the unilateral application of import restrictions "(b) necessary to protect human, animal or plant life, or health; (g) relating to the conservation of exhaustible natural resources, if such measures are made effective in conjunction with restrictions on domestic production or consumption". The interpretation of these provisions is provided by judgements of the WTO Appellate Body, which in the *turtle-shrimp* case appeared to accept that a country could make access to its market conditional on whether the exporting countries comply with environmental conservation policies prescribed by the importing country. While these issues are not directly the concern of agricultural trade negotiations, they do affect the developing countries' trade in agriculture and food (see Henson and Loader, 2001).

The social impact in developing countries of agricultural trade liberalisation has been examined at the aggregate level by considering the impact on food security and sustainable livelihoods. Within the multilateral context, 'food security' is taken to relate primarily to the adequate supply of imported food to Member States. This reflects a concern that liberalisation of world agricultural trade could lead to rise in world prices for commercial imports and a reduction in the volume of food aid available. Food security in this sense is a necessary (but not always sufficient) condition for ensuring food security at the individual level. To deal with

the potential adverse effects of higher world market food prices on low income and food importing countries, the URAA was accompanied by a *Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed Countries (LLDCs) and Net Food-Importing Developing Countries (NFIDCs)*. It identified four specific responses: food aid, favourable treatment with export credits, concessional financing for food imports, technical and financial assistance to increase agricultural productivity and production.

Analysis of the impact of the Uruguay Round trade liberalisation on the food security situation in developing countries is inconclusive, but does not show significant negative impact. Part of the increase in the volume of commercial food imports by developing countries which has occurred since 1995 can be attributed to a reduction in food aid volumes as a consequence of reduced EU intervention stocks, but “with only four completed years of data available, it is still rather early to assess the impact of the UR on global commodity markets and food security” (FAO, 1999a: 19).

To ensure that the objective of international agricultural trade liberalisation is consistent with the pursuit of effective food security policies in developing countries will require trade liberalisation to be accompanied by appropriate flanking and other supporting measures (Stevens *et al.*, 1999).

The social impact of trade liberalisation at the household level will be strongly influenced by local conditions. The character of the impacts will be diverse, and their incidence will vary between groups, with some gaining from trade liberalisation related change, and others adversely affected. An increase in demand for marketed output can increase household income and reduce vulnerability to risk. But increased commercialisation of rural activities can have an adverse social impact on social capital formation through the erosion of customs of collective support and assistance (Wiggins *et al.*, 1999).

Given the considerable diversity of agricultural production systems, natural conditions, social conditions, and regulatory approaches between countries, the economic, environmental and social impacts of agricultural trade liberalisation vary greatly between countries, regions and locations. Aggregate level studies point to economic welfare gains from agricultural trade liberalisation for developing countries as a whole, but with significant variation between countries in the magnitude of the gain. There are significant environmental costs at the international and national level associated with agricultural trade liberalisation. These are likely to be relatively more significant in developing countries where trade liberalisation leads to an expansion in commercial production, and environmental regulatory frameworks are weaker. The negative impact of trade liberalisation on the livelihoods of the poor on developing countries can also be significant, if their food security is threatened by a reduction in availability of emergency food supplies or by a weakening of social capital, through migration or abandonment of communal arrangements for support and cooperation.

The evidence in the studies reviewed indicates that agricultural trade liberalisation on its own, will not result in ‘win-win’ outcomes for developing countries. Modelling and empirical case studies are consistent in identifying potentially significant negative environmental and social impacts from agricultural trade liberalisation. Flanking and other environmental and social policies, which distort agricultural trade to the least possible extent, will be needed to move outcomes closer to a ‘win-win’ position.

The maize sector in NAFTA

In December 1992 the NAFTA agreement was signed by Mexico, Canada and the US and it went into force in January 1994. *Ex ante* environmental reviews were prepared in the US by the Office of the US Trade Representative (USTR, 1993) and in Canada by the NAFTA Environmental Review Committee (Government of Canada, 1992). Both reports looked at the environmental implications of the NAFTA Agreement. The Canadian review focused on the environmental implications for Canada alone, with other countries only being considered in relation to transboundary effects. However, the US Report also includes a discussion of Mexico's pollution control regime and recent developments in the US-Mexico environmental relationship.

Following the implementation of the NAFTA agreement there has been considerable research on the potential impacts of trade liberalisation particularly on Mexico. The most substantive and one of the earliest pieces of work to be undertaken, was a four year study by the NAFTA Effects Project Team (Commission for Environmental Co-operation, CEC) into the development and application of a methodological approach for analysing major environmental changes under NAFTA (CEC, 1999). The main document used in the literature review is the 'Issue Study on Maize in Mexico', which was one of the four case studies analysed during Phase II (1996–1997) of the CEC project (CEC, 1999). This is supplemented by Chomo and Ferrantino (2000), Graham and Wada (2000), Government of Canada (1992), Moreno (2000), León (2000), Nadal (2000), USTR (1993), Robertson (2000), Katz (2000), Schatan (2000), Williams and Shumway (2000).

The aim of the 'Issue Study on Maize in Mexico' is to consider the impacts on the environment arising from the behaviour of corn producers in Mexico in response to economic and social forces unleashed or sustained as a result of expanded North American trade and investment under NAFTA (CEC, 1999a). Therefore, although the economic and social implications are discussed, they are mainly considered as drivers for the main focus of the study, which is the effect on the environment.

The first stage of the study puts the issue in context in terms of the environmental, economic, social and geographic conditions. This provides a baseline from which NAFTA-associated change can be identified. The section on the economic context does provide some detail on the NAFTA associated change with respect to the economy and this leads on to a discussion of the response to the change in the economy in terms of changes in patterns of production and changes in social activity. The section on the social context details the social institutions and social history in the area relevant to the study. However, the social impacts of trade liberalisation are only discussed in detail in terms of their effect on the environment or their effect on changes in patterns of production.

Within the supporting literature, economic and environmental effects of NAFTA liberalisation are discussed both in general terms and also in relation to the particular sector being investigated (León, 2000, Graham and Wada, 2000, Chomo and Ferrantino 2000, Schatan 2000, Williams and Shumway, 2000). Social effects are not so well covered but are addressed in the studies by Nadal (2000), Robertson (2000) and also by Guerrero *et al.* (2000) in relation to the forestry sector. The majority of the studies reviewed rely on literature reviews and on data from government documents. Chomo and Ferrantino (2000) and Schatan (2000) perform a series of calculations based on primary data from various national and international sources

and Williams and Shumway (2000) apply aggregate production-based models to analyse the impacts of trade liberalisation and agricultural chemical use in the US and Mexico.

The 'Issue Study on Maize in Mexico' concludes that imports of corn from the US to Mexico have increased, and that domestic prices have dropped to international levels. However, despite this, the total production of corn in Mexico has remained the same and in some cases it has increased. Two possible explanations are offered for this observed pattern. Firstly, relative to other crops, the price of corn has remained higher for most of the period of study and secondly, there was a return to production in regions where corn had long-since ceased to be the most important crop. The study recognises that patterns of production and social activity are two processes through which responses to declining prices could be felt. The potential impact of different production responses open to Mexican corn producers and the potential change in social activity are discussed in terms of their impact on the environment. These are summarised below:

- Soil erosion – NAFTA-induced production processes are not the primary cause of erosion, however there are indirect effects arising from production techniques that respond to economic forces as a result of NAFTA which could accelerate existing problems – for example, the introduction of a monoculture on sloping terrain. Social activity such as migration may indirectly affect erosion particularly in areas where labour-intensive maintenance is required for the prevention or mitigation of soil erosion.
- Deforestation – if corn prices are low, poor households that produce corn for self-consumption will have to rely to a higher degree on fuel wood if they can collect it directly. Poverty and consumption of fuel wood and other biomass to meet energy needs are closely correlated.
- Water pollution – water availability and use is one of Mexico's most important resource-management issues. Intensive crop production, which involves greater use of water resources or results in the pollution of water, will put additional stress on this resource.
- Use of fertilisers and pesticides – much of the modernisation of the agricultural sector will rely heavily on the use of fertilisers and pesticides. This could have a negative effect on workers' health and result in the accumulation of pollutants in soils and water.
- Crop diversity – production methods, modernisation strategies, land use decisions, social organisation (institutional support for using certain types of corn, collaboration with neighbours, traditional cultivation technologies) will have important implications for the genetic diversity of corn.

Data presented by Graham and Wada (2000) show Mexican economic performance has been erratic but overall there has been slight economic growth during the 1990s. The data is consistent with the view that the continued expansion of foreign direct investment in Mexico was driven by the expectation of the free trade area created by NAFTA and that this effect was at least as important as the investment provisions of the NAFTA itself. However they state that it is too early to know for sure whether Mexico has benefited from the recent inflows of foreign direct investment. Graham and Wada (2000) also show that foreign direct investment in Mexico is associated with higher wages in the domestic Mexican economy and there has been an increase in the demand for skilled workers. Robertson (2000) supports this. However, he notes that this has had the knock-on effect of increasing wage inequality.

In terms of the social impact of liberalisation in the Mexican corn sector, the study by Nadal (2000) found that poverty levels have increased in the past five years particularly with respect to the corn-producing farmers. This is believed to be partly as a result of the NAFTA-induced

changes in trade and other government policies. Corn prices have dropped and there has been an increase in imports, which has resulted in the expansion in the surface area of corn cultivation in order to maintain production levels. There has been increased migration from rural areas and the weakening of social institutions. Similar effects have been observed in other sectors. For example, pressure on forestry producers to keep product prices low in the wake of the NAFTA agreement has been observed by Guerrero *et al.* (2000) and this has resulted in problems of illegal cutting and other unsustainable forestry practices. The study by Nadal (2000) reported problems of increased soil erosion and increased pressure on land, aquifers and forests as a result of liberalising the Mexican corn sector.

Chomo and Ferrantino (2000) conclude that in the case of Mexico, liberalisation may have relieved the total pressure on fisheries by permitting the substitution of imported fish for domestic catch. However, on the whole, NAFTA-related changes in trade policies have had a minimal effect on fisheries. In the case of Mexico's manufacturing exports and the environment, Schatan (2000) cautiously suggests that a 'win-win' situation does exist. The results of his study indicate that there has not been a shift of the most polluting industry towards Mexico and that the observed pollution expansion is a consequence of Mexico's intensification of trade in some of the most polluting sectors rather than a greater weight of polluting sectors. In addition, it is noted that within Mexico, there has been a partial specialisation in technologically sophisticated products that are comparatively less polluting than the more traditional manufactured export goods.

During NAFTA's drafting stage, trade negotiators did not take into consideration issues that they viewed as non-trade matters, including several possible environmental impacts of the agreement. Largely as a result of the public interest generated, an environmental advisory board was established and an environmental review was carried out. In the end, a few mitigatory measures in the form of general environmental provisions were included within the NAFTA Agreement, while details regarding methods and instruments for dealing with environmental issues were included in a separate, parallel agreement – The North American Agreement on Environmental Co-operation (NAAEC). The environmental goals addressed within the NAFTA Agreement and its parallel agreements were intended to address the problems of environmental standards, potential conflict with international environmental agreements and 'pollution havens', establish various environmental institutions and introduce the precautionary principle by establishing a new system of burden of proof (Katz, 2000).

The literature describes a complex picture of winners and losers and there is no clear picture as to whether or not a universal 'win-win' situation has resulted so far from the NAFTA agreement. Studies range from those highlighting the beneficial effect of liberalisation for the US, where León (2000) states that, 'NAFTA and its side agreements have contributed to equity, better economic performance of the member countries, job creation and economic growth. They have promoted the protection of the environment and labour rights', to warnings in Nadal (2000) over the 'deepening socio-economic and environmental crisis in rural Mexico'.

The 'Issue Study on Maize in Mexico' highlights two important trends in the production of corn. In the modern sector expanded production has occurred on irrigated land using technologies and techniques including hybrids and mechanised agriculture. This trend is described as being economically beneficial. However, the major impacts on the environment are negative and the only mention made of social impact relates to the demand on human resources necessary to implement several of the techniques. Secondly, poorer producers have

also expanded their production, although at a slower rate using traditional technologies on poorer land. This may be a positive finding but it is emphasised that, should corn prices fall too low, there is a risk of migration to find alternative employment. This will have a negative community effect and the quality of the remaining labour supply may be diminished. It may also result in negative impacts due to the loss in traditional skills and weakening social structures.

Whilst examining important relationships and identifying general trends, the issue paper does not clearly indicate whether a 'win-win' outcome has resulted from the liberalisation of the corn sector under NAFTA. Similarly, the simulations undertaken by Williams and Shumway (2000) in their analysis of trade liberalisation and agricultural chemical use in the US and Mexico also do not indicate a clear 'win-win' situation. However, the report by Nadal (2000) concludes that there are significant social, environmental and economic problems associated with liberalising the Mexican corn sector. The mitigatory environmental provisions built into the framework of the trade agreement have made the NAFTA agreement more environmentally sensitive than it would have otherwise been. Despite these mitigatory measures, Moreno (2000) concludes, 'the predictions of resounding failure of five years ago may still come true if the trade agenda fails to be continually informed and tempered by considerations of environmental protection and sustainable development.'

Other literature reviewed

Kousnetzoff and Chauvin (2003) conclude that the linkages between agricultural production changes induced by trade reforms and environmental damage depend on several case-specific factors. Such factors that include the natural resource base, the production systems, and agricultural and environmental policies need to be analysed at a regional or even local level in order to identify key environmental indicators relevant to the area under scrutiny.

Animal welfare issues have been discussed (van Horne and Bondt 2003, CIWF 2000, EAW 2000, CEC 2003a). The principal concern is that while a government can legitimately set standards for production in its own territory, any standards set which relate to methods of production rather than to the characteristics of the product, and which have the effect of discriminating against imports, will not be permissible according to the normal requirements of GATT. Liberalisation may therefore lead to increased competition in domestic markets from countries with low standards. It has been suggested that domestic producers may become uncompetitive, through the higher costs of producing to high standards, or governments may relax animal welfare legislation for their own countries. In either case, animal welfare standards for the food that is eaten would fall. The EU has therefore proposed in its submissions to the WTO that compensation should be permissible for the additional costs of meeting legal standards

Impacts of liberalisation on the rural poor in developing countries have been discussed in a review by UNDP (UNDP 2003). This notes that such communities often depend on subsistence agriculture and traditional production of locally consumed cash crops, on a small scale, with low productivity and limited access to distant markets. This traditional activity often coexists with commercial agriculture that is more highly mechanised, using higher intensity inputs, often owned by city based companies or foreign corporations, producing internationally marketable crops with relatively small amounts of labour. In areas that have already converted to commercial agriculture, employment can be expected to rise, with beneficial economic and social effects. Elsewhere however, the opportunities created by trade

liberalisation may be tapped more readily by commercial agriculture, with consequent incentives for commercial operations to expand their land use, reducing that available for traditional farming. This may result in an overall fall in rural employment, increasing poverty, and migration to the cities in search of alternative livelihoods. The changes in production patterns can also have significant gender impacts. In some areas women are mainly involved in traditional food production, while new jobs for commercial farm workers go mainly to men. Other areas such as floriculture may employ large numbers of women, but in conditions that may be less healthy and provide a poorer standard of living than traditional agriculture.

Competition for resources in rural and peri-urban areas may also create conflict between different social groups, with indigenous people among the most vulnerable (Mbiba 2002).

While distributional impacts of this nature may be exaggerated or accelerated by trade liberalisation, they are more fundamentally part of a wider process of agricultural commercialisation (Pingali 2001). A variety of policy approaches to minimising adverse effects and maximising beneficial ones are proposed.

The case studies carried out by UNEP (UNEP 1999) reveal a wide range of potential beneficial and adverse effects, influenced by levels and patterns of production and consumption. Barrett *et al* (2001) identify a number of common themes in a review of the empirical and analytical evidence:

- *Deforestation and degradation of marginal land.* In principle, increasing crop yields due to commercialisation may reduce pressure for land conversion. In practice, deforestation and other conversion have continued despite past increases in yields. This suggests that population growth and other demographic factors may be the more important effect, and that increasing yields may do little to slow the changes.
- *Toxic chemicals and pollutants.* Increased commercialisation has led to higher intensity inputs, and higher levels of agricultural pollution. In addition, increased exports to developed country markets have required a response to consumer demand for unblemished produce, and hence further increase in the use of insecticides and fungicides. Against this, consumer pressure and product labeling have reduced the use of some toxic and polluting chemicals.
- *Water consumption and salinisation.* The trend towards higher value crops tends to be less water intensive, leading to decreased pressure on groundwater and less salination. Similarly beneficial effects can be expected from the removal of subsidised water use in some developing countries.
- *Livestock and nutrients.* An increase in commercial livestock production for export markets may cause nutrient overloading from animal wastes. Against this, commercial agriculture offers greater possibilities for the management of wastes and their controlled use as fertilisers.
- *Transgenic crops.* The complex and potentially major effects of the adoption of transgenic crops are discussed below under Trade and Environment.
- *Air and water pollution from food processing.* Unless effectively regulated, increased processing in developing countries may have significant pollution impacts.
- *Transport.* While increased international trade in foodstuffs can be expected to increase the environmental impacts of transport, an increase in local processing may mitigate this effect. The net impact will depend on changes in the quantities transported at different levels of processing.

An OECD study of the potential environmental impacts of trade liberalisation identifies similar effects, and notes a potential further effect on biodiversity, through the creation of new pathways for the introduction of exotic species (OECD 2000).

In respect of the WTO agreement on trade-related aspects of intellectual property rights, there is no clear evidence that TRIPs and the Convention on Biological Diversity are incompatible with each other (CEAS 2000, CEC 2002). However, the Commission on Intellectual Property Rights expresses many concerns that the extension of intellectual property rights may run counter to the aims of the convention, or otherwise affect the environment (CIPR 2002). These concerns include:

General environmental issues

- erosion of farmers' rights and their traditional role in conservation
- usurpment of traditional knowledge and folklore, reducing their capacity to conserve biodiversity
- wider use of a smaller number of monocultures, reducing agricultural biodiversity
- prevention of low cost manufacture of patented environmental products such as CFC alternatives

Issues associated with transgenic crops

- beneficial effects of lower pesticide use, from varieties with built-in pest resistance
- adverse effects of higher herbicide use, from herbicide-resistant varieties
- transfer of genes to wild relatives or conventional crops
- indirect impacts on other components of the ecosystem that have not co-evolved with the varieties introduced
- more fragile, less sustainable agricultural systems
- more fragile, less resilient ecosystems

The CIPR review concludes that 'when there is so much uncertainty and controversy about the global impact of IPRs, we believe it is incumbent on policy makers to consider the available evidence, imperfect as it may be, before further extending property rights in scope or territorial extent' (CIPR 2002)

In relation to transgenic crops in particular, assessing the validity of these concerns, and identifying other issues of potential concern, 'is hampered by an exceptionally small core of scientific information' (Batie and Ervin 2001). The authors argue that long-run environmental implications of transgenic crops cannot yet be evaluated with any certainty, and that evidence to date is limited even for the potential environmental benefits that certain varieties are designed to achieve. It has been argued that beneficial impacts on conservation are unlikely, as 'conservation is fundamentally about protecting habitats and IPRs make no real contribution to this' (CEAS 2000).

For issues other than those related to transgenic crops and their potential environmental impacts, the evaluation is somewhat less problematic, although large uncertainties remain. It is fairly widely accepted that protection of traditional knowledge needs to be strengthened, and that a requirement for patent applicants to disclose the origin of their genetic resources may contribute to this (CEC 2002), with related benefits for biodiversity and benefit sharing.

However, the CIPR report suggests that such arrangements may be of little value unless they are legally enforceable within the international IPR regime (CIPR 2002).

New plant varieties are expected to increase food production per unit of land and labour, with potentially beneficial impacts on poverty, and potentially lower pressures on natural habitat. Again however, the evidence is mixed on whether these benefits will actually accrue. Food security is influenced as much by issues of distribution as it is by total availability (Scoones 2002), food supply is closely linked to population growth, and increased labour productivity generates the surplus rural labour that drives increasing urbanisation in developing countries (DFID/UN 2002).

5. ENVIRONMENTAL POLICY

5.1 Environmental Policy Linkages with Trade and Investment Liberalisation

The preceding sections have examined the implications for sustainable development, particularly in the environmental dimension, of greater liberalisation of international trade and investment flows. The review of literature showed that trade and investment liberalisation would not always result in ‘win-win’ outcomes. In particular, the economic gains from liberalisation may be accompanied by adverse environmental (and social) effects. Policy measures are needed, therefore, to mitigate any adverse effects of trade and investment liberalisation. Given that there is a broad consensus in the literature that most ‘win-win’ outcomes from trade and investment liberalisation are conditional upon the application of appropriate flanking measures, it is surprising that the appraisal of these measures has received comparatively little consideration so far.

The main focus of this section, therefore, is on environmental policy instruments, and their potential mitigating effect on the adverse impacts of trade liberalisation. The range of measures that might be used to promote ‘win-win’ sustainable development outcomes by strengthening economic efficiency, environmental improvement and social welfare, both nationally and internationally, is very wide. The policy instruments can be categorised into three main groups (OECD, 1997b):

- **Command and control instruments**

These directly regulate behaviour affecting the environment, typically through permit and authorisation procedures relating to the following:

- a) the products produced and distributed
- b) the materials used in production and distribution
- c) the technologies by which goods and materials are produced

- **Economic instruments**

These modify behaviour, using financial incentives and disincentives, to improve environmental performance through:

- a) charges and taxes
- b) grants and subsidies
- c) fines etc for non-compliance
- d) market creation instruments, such as emission permit trading schemes

- Other instruments

These often containing a non-mandatory element, and aim to improve environmental performance by i) improving the supply of information relating to environmental problems and ways of reducing them, and ii) raising the level of voluntary commitment, both at an individual organisation and collective level, to modify practices to reduce these problems.

The use of environmental policy measures to minimise the potentially adverse consequences of trade and investment liberalisation for the environment and sustainable development, may also have a reverse impact on trade and investment flows. The manner in which environmental policy is implemented varies greatly from country to country, reflecting differences in their preferences regarding environmental protection, in the absorptive capacity of their ecosystems, and in income levels. The differential application of environmental protection measures at the national level can affect national competitiveness and trade performance. Similarly, the application of environmental policy measures to particular production processes or investment activities may be inconsistent with the WTO rules of non-discrimination and market access.

Environmental problems can be divided into two types: domestic, in which the damage is contained within the boundaries of a country, and transboundary in which the damage affects more than one country. Dealing with the latter generally requires international cooperation. In both cases, the justification for the application of environmental policy instruments lies in market failures, which only become internalised where markets are perfectly competitive. Unfortunately, these idealised market systems are not realised in practice. Prices generated by imperfect markets convey misleading information about resource scarcity, providing inadequate incentives for management, efficient utilisation and enhancement of natural resources. The presence of open access resource exploitation and public environmental goods, externalities, and incomplete information and markets, all contribute to market failure (Rao, 2000). Therefore, the objective of applying environmental policy instruments is to change market behaviour in ways that are more consistent with behaviour when externalities are internalised, using methods which are feasible and cost-effective and which have acceptable distributional effects. At both national and international levels, a widely accepted principle of environmental policy is that of the 'polluter pays': public policy should try to ensure that firms pay not only the direct cost of production but also the social cost of the environmental damage they cause. The application of the polluter pays principle (PPP) therefore seeks to internalise environmental costs.

It is important to recognise that this objective is often imperfectly achieved. The economic benefits may be out-weighted by the economic costs incurred when the policy instrument is applied. Similarly, the distributional consequences may be adverse. Environmental policy instruments need to be carefully assessed, therefore, to ensure that the measures are feasible and cost-effective and have acceptable distributional consequences.

Key policy instruments for addressing the environmental externalities (positive and negative) associated with trade liberalisation and greater investment include:

- economic pricing policies
- trade measures based on process and production methods (PPMs)
- multilateral environmental agreements
- investment requirements.

Pricing policies involve the application of market-based economic instruments, whereas the latter three approaches mainly refer to regulatory (mandatory or voluntary) measures.

The choice of appropriate policies and instruments will depend on the nature of environmental problems to be tackled (unless dictated by mandatory regulations (DEFRA, 2002)). More specifically, the selection of environmental policy measures in the context of international trade and investment should be guided by an appraisal of potential outcomes from the application of these measures and, more specifically, by whether they are likely to contribute to 'win-win' outcomes. The following criteria may be used in their initial selection (Kirkpatrick and Lee, 2001):

Relevance: suitable to address specific impacts identified in the assessment (*i.e.* would reduce negative impacts and/or enhance positive impacts identified in the appraisal of specific trade liberalisation measures)

Workable: the measures proposed are practical in legal, organisational and technical terms

Cost-effective: the measures are likely to be a least cost way of achieving the desired improvement

WTO compatible but not necessarily WTO led: measures should be consistent with WTO rules but not necessarily organised, financed or implemented by WTO

Coherent: the measures should be both consistent with each other and with the goals of sustainable development

5.2 Pricing Policies

The use of economic instruments of environmental policy has been actively encouraged by the OECD, among others, and pricing policy has increasingly been used to supplement the use of other environmental measures such as command-and-control direct regulations (standards, bans, quotas) that focus mainly on point-source pollution and specific issues like hazardous waste. Market-based economic instruments (such as taxation and tradable permits) are likely to both apply the polluters-pay principle and be more cost-effective in addressing wider environmental problems that require a change in behaviour across the economy rather than just controlling certain activities (ACCA/EA, 2003). In addition, compared to command-and-control measures they seem to provide more potential for static and dynamic efficiency gains, as well as more flexibility in meeting environmental objectives (World Bank, 2003). More recently, a fiscal argument has been added, namely that the introduction of environmental taxes may contribute to the process of fiscal reform by allowing other, less desirable taxes to be reduced (the so called 'double dividend' (OECD, 2003b)).

However, although theoretically achievable, these efficiency gains may not be realised in practice if, for example, the charges are not set at the appropriate level to achieve the environmental quality target. Similarly, the dynamic efficiency gains from technical change and innovation may not be realised in practice if, for example, financial incentives are set at too low a level. The institutional context in which economic instruments are applied will also influence the effectiveness of the instrument in practice. It is generally advisable that economic instruments for pollution control are introduced within environments that are already experienced with command-and-control regulatory approaches and have in place a

well-designed environmental monitoring system and effective capacity for enforcement (Kraemer *et al*, 2003).

It is generally agreed that the removal of subsidies that are coupled to production diminishes the incentives for the over-use of polluting inputs and lowers the pressures on environment. For instance, OECD (1997) discusses the example of water-relevant “perverse” subsidies to agriculture in OECD countries. Subsidies to agriculture in most OECD countries not only entail considerable economic costs and inefficiencies but also favour agricultural production patterns with high negative environmental repercussions. Hence, the removal of subsidies in such cases is expected to provide a “win-win” scenario. However, it should be noted that ‘no reliable quantitative assessment was possible of the fiscal and environmental consequences of subsidy reform in the water sector’ (OECD, 1997:38). Also, policy measures like the elimination of subsidies are not easy to implement and need to be phased in ways that allow for non-disruptive social and political adaptation. Finally, it is worthwhile noting that not all subsidies have a perverse effect, and that government support is socially desirable in cases where it pays for previously unpaid environmental benefits. For instance, the Parties to the Kyoto Protocol may encourage fuel/energy efficiency through the provision of subsidies that support climate-friendly technologies (*e.g.* green electricity production, combined power and heating technology) and the consumption of renewable forms of energy (Swedish National Board of Trade, 2004).

Other pricing policy measures that may be used to promote sustainable development include environmental taxes and tradable permits. Beghin *et al* (2004) provide a case study of the Santiago metropolitan area and use computable general equilibrium techniques to show that environmental taxation on air pollutants has the potential to promote all three pillars of sustainable development by inducing efficiency gains, environmental benefits, and health improvements. Taxing air pollutants results in health benefits that are greater than the efficiency losses associated with the introduction of taxes, leading to both environmental and net efficiency gains. Parry and Bento (1999) also employ a simple numerical CGE model and find that the efficiency gains from recycling environmental tax revenues are larger than the additional distortions they might introduce. The authors explain their results by arguing that pre-existing taxes not only were distorting factor markets but also consumption decisions, whereas revenue-neutral emission taxes might display negative net economic costs in a setting where all revenues are lump-sum transferred to the household. Hence, revenue-neutral packaging of environmental taxes combined with reductions in other less-desirable taxes may eliminate some of the business costs of the sector and therefore reduce the fear of competitiveness loss due to the additional environmental tax burden (OECD, 2003b). Moreover, revenue-recycling if distributed uniformly across processes might have long-term positive consequences as resources would further shift towards cleaner productive capacities. This might be the case for example, if an OECD-wide environmental tax is applied to the steel industry (OECD, 2003c). The author employs a partial-equilibrium model of the steel sector and argues that an OECD-wide carbon tax combined with a uniform redistribution of tax revenues across processes would induce further significant restructuring towards cleaner steel making. However, the environmental benefits initially achieved through eco-taxes might be substantially dampened if the recycled revenue is used to cut down taxes applied elsewhere to “dirty” sectors (OECD, 2003b).

Tradable permits provide individual companies (and governments) with the choice of responding to achieve desired outcomes and complying with emission ceilings (and national targets) in the most efficient manner (ACCA/EA, 2003). The establishment of emissions

trading regimes provides an incentive for firms to implement cost-effective strategies that would deliver pollution abatement solutions and the possibility of selling their excess credits to more-polluting companies (World Bank, 2003). In addition, auctioned tradable permits are often assumed to have equivalent effects as environmental taxes, in particular in terms of competitiveness (OECD, 2003b). This is due to the fact that auctioned tradable permits perform the same revenue raising functions as eco-taxes that could then be used to reduce the rates of other existing distortionary taxes on businesses. However, this does not necessarily imply that emissions trading schemes should replace environmental taxes. On the contrary, it is recommended that tradable permits be applied in conjunction with eco-taxes, as these economic market-based instruments are very likely to reinforce each other. For instance, with a tradable permit regime in place, an environmental tax could bring additional incentives to cut down pollution as it forces a cost on the difference between the number of rights held and the actual usage, and consequently any unused rights would eventually carry a price for businesses (Kraemer *et al*, 2003).

However, whereas environmental taxes and tradable permits might work if applied to air pollutants, these are more difficult to implement in relation to other environmental problems such as soil pollution and biodiversity loss, in particular where environmental assets do not have well-defined property rights. This is because a first-best Pigouvian tax to correct an externality would require the regulator to measure the use of the resource, the value that people attach to it, and to levy a fee to enforce compliance, actions that are very difficult to undertake in practice.

The possibility that economic measures to internalise environmental costs might have adverse effects on sectoral and national competitiveness has been a major concern of policymakers and industry (OECD, 2003b). The effect of environmental taxes on the competitive position of firms will be a matter of relative performance. Some firms will be affected more than others and it is even possible that some firms will benefit in terms of profitability from ‘first mover’ advantages or gain from marketing advantages from a ‘green’ image. At the international trade level, the effect on national competitiveness will be gauged by the changes in macroeconomic indicators, such as the exchange rate and real wages. Much of the existing evidence suggests that the impact of environmental policies on overall competitiveness is limited (Charnovitz, 1998). A number of possible reasons have been suggested for this:

- environmental compliance costs are small relative to other costs of production, so that environmental protection can be purchased at relatively low abatement cost
- environmental policies have been designed to minimise competitive effects, using mechanisms such as exemptions, rebates, subsidies and phase implementation
- data and methodological limitations may mean that effects on overall competitiveness have not been detected by investigative research (OECD, 2003b)

5.3 Trade Measures based on Process and Production Methods (PPMs)

PPMs, processes and production methods, refer to the way in which a product has been produced. PPM-based trade measures specify processes or production methods that either must or must not be used (Lankoski and Lankoski, 1999). There are two types of PPMs. First, there are those product-related environmental PPMs that have an impact on the final characteristics of the product. These are equivalent to product requirements for purposes of WTO rules and are covered by the GATT, TBT and SPS agreements. Second, there are non-product-related PPMs that are not reflected in the product’s final characteristics. These relate

to production externalities that arise in the producer country and may or may not have trans-border spillovers. They do not relate, however, to consumption externalities that arise in the importing country. PPM-based measures are increasingly considered necessary to address domestic environmental problems. Non-product-related PPMs are not covered by the GATT, TBT or SPS agreements.

Non-product-related PPMs could have an impact on the market and in this way affect importers, as in the case of eco-labelling. Debate has recently arisen around the issue of eco-labelling and its legality under the WTO agreement on Technical Barriers to Trade (TBT). Eco-labels represent indicators of the product's environmental performance and have been developed to support green/sustainable consumerism, provide information to consumers, and encourage manufacturers to achieve better environmental performance (Childs and Whiting, 1998). Put differently, the main objective of an eco-labelling scheme is to create a market-based incentive for better management of natural resources by creating consumer demand for products from well and sustainably managed stock (Wessells *et al*, 2001). However, as the authors note, such an incentive will exist as long as consumers express environmental concern and as long as eco-label providers create and maintain sufficient credibility and public engagement in eco-labelling. Eco-labelling is viewed as a new, "second generation", environmental policy instrument that will become more important in the near future and will increasingly substitute and supplement previously established environmental measures such as sustainable development strategies and eco-taxes (Kern *et al*, 2001). Currently, several eco-labelling schemes are coexisting and competing across the globe. This tends to create confusion amongst consumers and producers, and may impede labelling performance, if competing labels do not show signs of increased convergence (Kern *et al*, 2001). As the processing and production methods impact on environmental performance, and as the WTO position on non-product related PPM eco-labelling is as yet unclear, the issue of promoting the legality of non-product related PPM eco-labels has also received much attention. It is important to note here that setting mandatory international standards regarding eco-labelling is only relevant for global environmental impacts. This is because eco-labelling ameliorating any ecological impacts that are not trans-boundary should be voluntary since each country is free to determine the value it places on the environment (George and Kirkpatrick, 2003). Support for eco-labelling as efficient tools for promoting better resource management has in particular been given by developed countries (Wessells *et al*, 2001). Nonetheless, the authors note that developing countries express increasing concerns that they might not have a powerful voice in creating eco-labelling standards and that the development of a set of standards would lack transparency. Another concern expressed by developing countries is that eco-labelling might prove to be another form of disguised protectionism and restricted market access, that would erode their competitiveness in terms of increased costs of meeting foreign labelling standards. However, the latter argument does not find much support in empirical evidence and it seems that the competitive effects of environmental standards (seen as technical barriers to trade that adds to exporter's costs) may have been somewhat overstated in the public debate. For instance, WTO (1999) enumerates various empirical studies that have investigated the effects of the introduction of environmental regulations on competitiveness. The study concludes that there is very little evidence that environmental standards might impede upon an exporter's competitiveness position in the trading system. Xu (1999) reaches a similar conclusion. The author uses regression analysis to empirically argue that environmental stringency has a negligible role in determining an industry's level of international competitiveness. Moreover, according to the "Porter hypothesis", regulatory pressure similar to competitive pressure might encourage technological innovation that would eventually promote more efficient and cleaner production methods, offsetting any environmental compliance costs.

Nevertheless, the concerns expressed by developing countries act as a caution to the potential non-environmental impact of such schemes, and the key challenge will be to guarantee that their effects will be mostly positive, *i.e.* those that meet the objectives of sustainable development and healthy ecosystems (Wessells *et al.*, 2001). It is worth noting here the interesting observation made by Dosi and Moretto (1998) that the adoption of cleaner technologies within a firm due to eco-labelling might not be necessarily accompanied by a reduction in investments in conventional production processes. This might occur in the case where a firm expects that the eco-label obtained for a specific product will project a positive image across its entire product range, inducing increased investment in conventional polluting technologies. A stricter selection of candidates and more effective measures might be necessary to prevent such perverse effects. Yet another concern expressed by developing countries that needs to be seriously considered pertains to their economic, social and environmental priorities. Sustainable development concepts and the weights attributed to each of the three pillars might differ greatly between developing and developed countries. For instance, poor countries might be more concerned about infrastructure, education and health than any environmental issues, or about clean waters rather than global warming (UNEP/IISD, 2000). The authors note that, at a minimum, such concerns should be met with financial and technical assistance to help promote capacity building and environmental improvements.

Other trade measures based on processes with a view to promote sustainable development refer to trade and investment restrictions and bans when certain environmental problems persist and ecosystems are under threat. Because countries are linked mostly through trade and interact under the supervision of WTO, the use of these environmental policy measures may in principle conflict with GATT articles. For example, trade bans may conflict with rules on the elimination of quantitative restrictions. The potential conflict between environmental and trade policy is discussed in more detail in the following sub-section on multilateral environmental agreements.

5.4 Multilateral Environmental Agreements

More than 200 multilateral environmental agreements (MEAs) now exist, with membership varying from a relatively small number of countries to over 180 (Brack and Gray, 2003). More than 20 of these MEAs incorporate trade measures, restraints on trade in particular substances or products, either between parties to the treaty and/or between parties and non-parties.

UNEP/IISD (2000) enumerates the following key MEAs with trade provision:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (entry into force: 1975);
- Montreal Protocol on Substances that Deplete the Stratospheric Ozone Layer (entry into force: 1987);
- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (entry into force: 1992);
- Convention on Biological Diversity (entry into force: 1993);
- Framework Convention on Climate Change (FCCC) (entry into force: 1994);
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC) (entry into force: 1998);
- Cartagena Protocol on Biosafety (entry into force: 2000)

UNEP/IISD (2000) also identifies four main reasons why trade restrictions have been incorporated into certain MEAs:

- Regulatory framework: some regulatory constraints are mandatory for all market participants if scientifically-based severe and irreversible environmental damage is to be avoided;
- Containment: certain limits/borders need to be imposed due to practical requirements of administering environmental markets disciplines;
- Controlling markets: an international structure of market control is required for cases of high-demanded products that display scarcity values;
- Ensuring compliance: securing greater compliance with MEAs could be effectively promoted under the threat of imposing limits on trade that are neither arbitrary nor disproportionate.

The debated issue is whether the respective trade restrictions are compatible with WTO rules. Currently, both the WTO and the various Multilateral Environment Agreements (MEAs) are responsible for regulation of different dimensions of the trade and environment relationship. This raises the issue of potential incompatibilities between these two domains of trade and environment regulation. This issue is often regarded in the wider community as an important source of conflict between international trade and environment policies. Furthermore, it is also a source of possible confusion and conflict in the internal policies of governments that have accepted the multilaterally agreed rules of the WTO but at the same time, have subscribed to MEAs whose compatibility with the WTO may be doubtful. The main documents used in the literature review are Brack (2000), supplemented by WTO (1996); OECD (1999c); OECD (2000) (papers by Fauchald (2000) and Torres (2000)), House of Lords (2000), Brack (ed) (1998), Ward and Brack (eds) (1999) and Jha, Markandya and Vossenaar (1999).

Most of the studies which have been published to date have concentrated on identifying the potential conflicts of any trade provisions in MEAs with existing WTO rules. The likely environmental consequences have not been examined, other than in a preliminary manner. Any resulting social and economic effects (i.e. also relevant to an overall sustainability impact assessment) do not appear to have been investigated. Similarly, the economic, environmental and social consequences of alternative specific measures to remove these incompatibilities do not appear to have been assessed.

The methodology used in carrying out the above studies is largely rooted in international law and draws heavily on case law experience in identifying the potential conflicts that may occur. Brack (2000) concludes:

- “MEAs are an important means of protecting the global environment.
- In a number of cases, they may need to employ restrictions on international trade in order to help achieve their aims.
- In general, there are no non-trade restricting alternatives that appear to be as effective.
- In any case, the trade restrictions cause minimal disruption to the world economy.”(p. 10).

The implications of these conclusions, if these are accepted, are that the trade restrictions contained in approved and draft MEAs are likely to have positive environmental impacts without (in his view) having any significant negative economic consequences (no reference is made to social impacts). Provisionally, this may be regarded as a ‘win-no loss’ outcome, given

also that none of these trade measures have so far been challenged through the WTO disputes procedure. Elsewhere, Brack (2000) concludes that further benefits may be drawn from clarifying the interpretation of the WTO rules to remove uncertainty in the future (House of Lords (2000), vol. 2, p. 103).

Recent interpretations of these rules, within WTO, have already gone some way to reduce uncertainty. For example, the Secretariat has stated that: “problems were unlikely to arise in the WTO over trade measures agreed and applied among Parties to an MEA”. However, concerns remain, particularly among developing countries, that trade measures might be used by some governments “to ‘level the playing field’ using the threat that less stringent standards would be considered akin to subsidies to the producers involved” (Torres, p.176, in OECD, (2000); see also, Jha, Markandya and Vossenaar (1999), ch. 3). In its report, the House of Lords Select Committee on the European Union (2000) concluded that there was broad support among witnesses to encourage closer links between other international agencies and the WTO, and stated itself that “we agree strongly ... that there should be better co-ordination between the WTO and other international bodies so that each can fulfil its proper function within the framework of international governance” (House of Lords (2000), vol. 1 para 62).

The main limitation in this group of studies is that their findings on possible ‘win-win’ outcomes are insufficiently substantiated. They provide valuable interpretations of the relevant provisions in international law and of the case law findings relating to this. However, these are not sufficiently supported by systematic empirical analysis of the economic, environmental and social outcomes from the implementation of existing trade measures within MEAs. Nor have there been sufficient analyses of the likely outcomes of those that might be introduced by future trade liberalisation, or of alternatives that might be used to achieve similar sustainable development objectives (see Fauchald (2000) for one approach to impact assessment of new trade rules). If such additional studies were undertaken, with effective participation by developing countries, they might enable future negotiations to proceed on a better-informed and less contentious basis. The Swedish National Board of Trade (2004) investigated such issues with reference to the UN Framework Convention on Climate Change, its Kyoto Protocol and the WTO rules. Its main conclusion was that the two bodies of rules seem to be compatible, but that the Convention and the WTO appear not to be explicitly mutually supportive. Hence, the promotion of mutual supportiveness between WTO and MEAs in general, and increased cooperation at the interface between trade and environment are essential for a friendly coexistence of trade and environmental regulatory bodies with favourable consequences for sustainable development prospects.

5.5 Investment Requirements

Foreign direct investment flows have grown rapidly over the past three decades from about \$60 billion in 1982, to about \$200 billion in 1990, and almost \$1,300 billion in 2000 (UNCTAD, 2001). For many developing countries FDI now accounts for a significant share of total private investment. Investments are made primarily by transnational corporations (TNCs), and can make a positive contribution to employment, technology transfer, growth, productivity and competitiveness in the host country, as well as generating profits for the corporation and its home country. FDI will also have an impact on the host country’s environment. These impacts can be both negative and positive, depending on the nature and scale of the investment.

Countries generally aim to attract FDI in order to obtain the perceived benefits, by offering incentives such as tax concessions. At the same time governments negotiate with investing TNCs, in order to minimise any adverse effects on domestic competitors. In doing so they may place restrictions on the activities of investing companies, which are considered to be trade-distorting (Trade-Related Investment Measures, or TRIMs). TRIMs may include local content requirements, import restrictions, export requirements, or domestic sales limitations. It was not possible in the Uruguay Round to negotiate a full agreement setting out internationally agreed provisions on the treatment of investment and the current WTO TRIMs Agreement applies only to those measures defined in an illustrative list. A separate attempt conducted within OECD to establish a Multilateral Agreement on Investment (MAI) collapsed in 1998.

As previously noted, trade liberalisation and increased investment flows are likely to negatively impact the environment, in particular through scale effects. Hence, a robust environmental management regime that fosters an effective environmental impact assessments and enforcement system, is an important pre-requisite at both the domestic and international level, if investment is to contribute to sustainable development (IISD, 2002).

Differences in the scope and effectiveness of national environmental policy towards foreign investment have fostered several related concerns about the impact of environmental policy on investment. If the costs of compliance with environmental regulations increase more rapidly in the North than in the South, we might expect to see the relocation of dirty industries to the developing countries where the costs of compliance are lower. This pattern of FDI relocation might be reinforced if countries deliberately try to attract FDI by offering lower environmental regulations, resulting in a competitive 'race to the bottom'. This pollution haven hypothesis has been extensively tested in the literature, which has not produced strong supporting evidence. The OECD (1997a) in a review of the literature on FDI and the environment states that 'fears of a 'race to the bottom' in environmental standards, based on the idea of 'pollution havens' may be generally unfounded'. Also, Jaffe *et al* (1995) conclude that there is little evidence to suggest that stringent environmental regulations have a significant effect on industrial competitiveness in developed countries.

Research conducted by the US government has indicated that environmental protection costs have sometimes been a factor in industry relocation, but studies by the Mexican government of the effects of NAFTA suggest that foreign corporations have better environmental and safety records than domestic firms (Grossman, 2002). Similar findings have come from a comparison of multinational and local companies' operations in China. Other studies have shown that, overall, environmental protection costs are rarely a major factor in international companies' relocation decisions (van Liemt, 2001). For most corporations, environmental costs are only one of many factors in their choice of location. In manufacturing, the cost of environmental control is typically 2 to 3 per cent of total costs, although it can be much higher in particular sectors, such as aluminium or cement manufacture (UNEP/IISD, 2000). Even there, modern clean technologies which conserve raw material input usage may be more efficient economically as well as environmentally, so a company's choice of location may be irrelevant to its environmental performance.

In general, any advantage manufacturing TNCs may take of weak environmental regulation tends to be indirect, operating through local producers rather than through laxer standards in their own relocated activities. However, this does not apply so strongly for commodities. Here, economic and environmental efficiency may be less closely aligned, and consumer

pressures to maintain environmental standards overseas may have less effect (UNEP/IISD 2000). Since the production of commodities is a major component of the economy in many developing countries, the environmental impacts of increased investment in such activities may in some cases be significant, particularly when regulation is weak.

The case of extractive industries presents particular challenges for environmental policy towards foreign investment. While mining FDI represents no more than 4-5 per cent of total FDI flows to developing countries, it can represent a significant share of overall FDI in some regions and for individual countries. For example, in the member economies of the Southern African Development Community (SADC), mining FDI represents 23% of total FDI. In Ghana FDI in mining represents 55% of total FDI and 45% of exports. The mining sector has potentially significant adverse environmental (and social) impacts. Cademartori (2002), for example, investigates the impacts of foreign investment on sustainable development in the desert mining region of Antofagasta (Chile) that has witnessed spectacular economic growth in the 1990s due to substantial FDI. Because of its good economic performance Antofagasta has been labelled as a model region by international financial institutions. However, as the author notes, the explosive growth in mining has triggered a set of problems in the region, such as deterioration in employment conditions, environmental degradation and geographically uneven development.

Historically, the most important environmental impacts of mining have included the discharge of toxic substances into river systems, large volume waste disposal, and equate disposal of hazardous waste (OECD, 2002). Social impacts include the displacement of people and the destruction of local communities' livelihoods. Because of the sector's poor environmental and social record, opposition to new mining projects from civil society has increased. In many developing countries the capacity for effective environmental regulation of the mining sector is weak and regulatory failure has allowed avoidable environmental impacts to occur. Where regulatory systems are weak, the role of voluntary self-regulation becomes more important. The OECD Guidelines for Multinational Enterprises, which have been approved by more than 30 OECD and non-OECD governments, are intended to encourage better social and environmental corporate governance. However, "to date the efforts in the mining sector have been insufficient to improve the sector's 'social licence to operate'" (OECD, 2002: 13). The main reasons given are the problem of free-riders, the frequent lack of a set of clearly defined targets, inadequate monitoring and enforcement procedures and the absence of external independent verification.

Hence, developing countries need FDI that promotes the adoption of higher environmental and social-responsibility standards, and encourages the fulfilment of sustainable development and poverty reduction strategies of host regions (IUCN/WBCSD, 2002). This report identifies the promotion of sound corporate governance, the building up of public-private partnerships to deliver development projects, and the issuance of regulations imposing certain human and environmental health standards, as tools for ensuring that FDI promotes sustainable outcomes in its host country. Gardiner (2000) also mentions the promotion of greater environmental commitment in host countries that could be only achieved through increased international cooperation and targeted international assistance for those host economies that lack the means to inspect, monitor and effectively regulate foreign investments to ensure that they promote not just economic development but sustainable growth. In addition, for most developing countries, the synergies between official development assistance (ODA) and FDI could be enhanced to help support sustainable development (Vitalis, 2001). This requires an efficient use of limited capital resources, which could be achieved by drafting structured international

investment agreements with the capacity to enforce the necessary mechanisms that would insert domestic health, safety and environmental issues into investment requirements (UNEP/IISD, 2000).

5.6 Summary and Conclusions

Trade and investment liberalisation impacts on the environment in many different ways. In many situations – possibly the majority – both the economy and the environment may benefit but only if certain preconditions are met. These preconditions are established by implementing a set of policies that will allow for ‘win-win’ outcomes to be realised. The aim of key policies such as those outlined above is to ensure that any negative repercussions that greater trade and investment liberalisation might have on environmental performance are minimised as much as possible and that any eventual positive impacts are maximised. The objectives of such policies *may* conflict with the principles underlying trade and investment liberalisation, as they are intended to promote environmentally sustainable development rather than simply economic efficiency and growth. How environmental policy-making relates to multilateral trade and investment policies is an ongoing and contested area for international discussion and negotiation within and outside the WTO (Jha, 2002; Sampson and Chambers, 2002). Irrespective of the institutional structures that evolve, multilateral trade policy and environmental policy-making need to jointly address issues in a balanced and coherent manner, which recognises that trade liberalisation and environmental protection are each means for achieving the end goal of global sustainable development. Policies on economic development and environmental (and social) protection should be designed and implemented in conjunction with each other, thereby avoiding the separation of trade liberalisation policy from environmental policy. In other words, the more integrated environmental and trade policies are, the more sustainable economic growth will be (Panayotou, 2000). Moreover, it is crucial in the case of developing countries that besides effective cooperation between various institutions and governments, substantial additional financial and technical assistance is provided to enable the poorer nations to engage effectively in this process of enhancing understanding and strengthening policy coordination in the areas of trade, environment and development.

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