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ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

Economic Reforms, Trade Liberalization and the Environment: A Synthesis of UNEP Country Projects

A SYNTHESIS REPORT

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I. Introduction

This report presents a synthesis of the main findings and conclusions from six projects being undertaken by UNEP to assess the environmental effects of trade liberalization and other trade-related policies in developing countries. These country projects have been undertaken in an overall policy context in which there is increasing recognition of the need for environmental assessment of economic policies, to contribute to design of policies which support sustainable development. The data collection and empirical research on which these projects are based, have been undertaken by policy research institutes in the respective countries which are familiar with local conditions, economic and environmental needs and policy priorities. The projects provide data and analysis on *actual* situations and linkages between trade, environment and development policies and objectives, at the national level. The relative lack of such data and analysis on real life situations has been hampering discussions and design of policy responses to trade-environment-development linkages.

These projects had three more specific objectives. The first was to provide rigorous analysis on the complex interaction between trade, environmental and developmental policies in economic sectors that are of particular importance to these and many other developing countries. The second is to enhance the capacity of institutions within these six countries to analyze these linkages, as well as to enhance the networking between researchers, policymakers and other stakeholders who may wish to respond to those linkages. The third is to record the analytical process and policy design taking place in these national level projects and to disseminate it more broadly, including at the global level.

The current round of projects build on the results of an earlier round of six UNEP projects examining the environmental effects of trade liberalization and the use of economic instruments for environmental protection, that were undertaken between 1997 and 1999. UNEP was one the first organizations to initiate such work at the national level, and the current round of country projects has been designed to have stronger elements of capacity-building and design of policy responses to recorded environmental effects.

The current round of country projects has to varying degrees focused on environmental, social and economic effects depending on the availability of data. In some countries economic and social effects were found to be more prominent than environmental effects. Moreover, environmental data were lacking and/or methodologies for determining and quantifying the environmental effects of trade liberalization are still evolving. As noted above, one of the primary objectives of these UNEP country projects has been to build the capacities of those national institutions to tackle such methodological challenges when undertaking assessments, in a creative manner in the specific context of these sectors and countries.

These country projects have been undertaken simultaneously with the drafting of UNEP's *Reference Manual on Integrated Assessment of Trade-Related Policies*, which was published in June 2001. This manual was drafted with the assistance of a group of experts, which included the team leaders from the current six country projects. This inclusive drafting process enabled UNEP to combine the knowledge of experts with conceptual and theoretical expertise of assessment methodologies with those of experts applying and developing them on the ground. In the reference manual, the experts also sought to extend assessment beyond the environmental effects to economic and developmental effects of trade-related policies.

The results from the country projects show that the relationship between trade liberalization and the environment is complex, often indirect and mediated via effects on levels and patterns of production and consumption. Trade through changing patterns of production and consumption has beneficial and adverse effects for the environment: for example, increased trade can lead to the increased generation of financial resources to help overcome poverty and pay for environmental protection measures, but also to more pollution and natural

resource depletion. Many factors influence what the particular mix of benefits and costs will be in different countries, at different stages of economic development, and under different policy and market conditions. The assessments undertaken in these country projects are a first step towards defining and quantifying those different effects.

These projects have been undertaken in developing countries. This developmental context is important because achieving a sustained rise in the levels of per capita income is a policy priority for these countries. In developing countries with a weak industrial base, a rapid and sustained rise in the levels of income depends on increasing investment, which often may have a high import content. This is because in the initial stages of development, capital equipment has to be imported and paid for by increasing exports of the natural resources. However, the exploitation of these endowments can be detrimental to sustainable development when the resources are not renewable, such as minerals, or their rate of depletion is greater than the rate of regeneration, as can be the case for resources such as timber. The pressure on natural resources will vary between countries, but is likely to be greater when imports are liberalized before competitive export industries are established. This can be explained by the fact that, when increases in imports precede export growth, countries tend to reduce their trade deficit by raising their natural resource exports. Associated problems of natural resource depletion and environmental degradation will then be exacerbated, especially in the absence of a well developed environmental policy framework.

By deepening appreciation and analysis of this nexus between trade, environment and economic development, these country projects aim to empower governments and other institutions seeking to respond to this dilemma. The ultimate aim of such assessments is to *maximize the net gains of trade and trade liberalization*, by enabling countries to design and implement integrated policies, which minimize associated environmental damage.

UNEP expects that all six country projects will be completed by the end of 2001, and that some of them will be extended into a policy design and implementation phase with interested governments. The findings of these assessments will be published in separate volumes and in a more comprehensive synthesis than is possible to draw together in this paper. Readers of this paper are therefore referred to those more complete publications, which will be available in the first half of 2002. In the meantime UNEP hopes that this preliminary synthesis of the results of this work will make a useful contribution to understanding of the dynamic relationship between trade, economic development and the environment.

II. Theoretical Framework¹

This section aims at presenting the theoretical framework on which the country case studies are based. This framework has been elaborated according to the UNEP Reference Manual on Integrated Assessment of Trade-Related Policies, which has been developed simultaneously with the conduct of the country case studies. This Manual has itself been structured to a large extent by efforts to theorize and summarize the experiences of assessment "on the ground", in both rounds of UNEP country projects.

Assessment focusing on a sector

A number of organizations have adopted a sector-based approach to the assessment of trade policy and trade liberalization at the national level. The advantage of this approach is that the positive and negative effects of the policy or agreement under consideration may be more easily identifiable as collecting statistical data can prove less difficult and the data itself, more reliable. The disadvantage of this approach is that economy-wide impacts are not immediately identified and that important cross-sector links may not be captured in the process.

Among the most important criteria for selecting priority sectors, are the following

¹ This section draws on "Building on developing countries experiences with integrated assessments of trade" Trainfortrade 2000, UNCTAD, mimeograph, 2001, Geneva.

characteristics and considerations.

- The sector is important to the national economy and in particular in its contribution to export revenues.
- The sector relates directly or indirectly to major environmental media and natural resources.
- The sector relates directly or indirectly to important issues of equity and social well-being.
- The sector furnishes strategic natural resources (such as a certain foodstuff) to a large proportion of the population.
- The sector is subject to changes in economic rules induced by trade-related policies.
- The sector is significant in terms of trade flows, both in volume and financially, and should be experiencing changes in trade flows.
- There is a presumption of important sustainability effects due to trade-related policies.

Timing

The timing of an assessment is another important factor. An **ex-ante assessment** takes place prior to the implementation of trade liberalization policies (TLP) a trade related-measure (TM) or the negotiation of a trade agreement (TA); a **concurrent assessment** takes place during the implementation of TLP, a TM or negotiation of a TA; an **ex-post assessment** takes place following the implementation of TLP a TM or the final ratification of a TA.

Until now, UNEP has mainly conducted ex-post assessment. However, it is also important to note that integrated assessments can also stretch over more than one of these time periods, or could even be conducted as a continuous process. For instance, the results of a particular ex-post assessment could be used as the baseline for a future ex-ante assessment.

II. 1. Preliminary Assessment

There are many ways of assessing environmental and sustainable development effects of trade policies or trade liberalization. One of the most commonly used approaches is based on the environmental assessment methodology of the OECD², which has been further developed by other practitioners of assessment, including UNEP. This methodology qualitatively assesses the impacts of trade on the environment and can be similarly used to assess the social impacts of trade policy. It takes into account the full range of effects—direct and indirect—that trade reforms may have on the environment and on society. Five broad categories of environmental impacts from trade reforms can be identified:

Product effects. These effects occur when the products themselves have an impact on the environment or development. Some of the products traded may be environmentally friendly, while others may be hazardous to the environment. Overall product effects therefore can be positive or negative, depending on the nature of the products traded as well as their volume.

Technology effects. Increased trade may lead to the transfer of production technologies across borders. Again, these technologies may be harmful or friendly to the environment. There is a positive technological effect when a trade policy allows the flow of environmentally friendly technologies, and a negative effect when it prompts the transfer of harmful technologies.

² Organization for Economic Co-operation and Development, *Methodologies for Environment and Trade Reviews* (Paris, 1994, OCDE/GD(94)103, online).

Scale effects. Scale effects occur as trade reforms often raise the overall level of economic activity. This is usually accompanied by a higher rate of use of natural and environmental resources. This could be offset if efficiency is improved, or if higher economic growth makes greater investment in environmental projects possible.

Structural effects. Trade liberalization could lead to changes in the composition of a country's economy, as it specializes in the production of goods or services where it has comparative advantage. If the changes favour the less-polluting industries, then positive environmental effects could be felt in that country. On the negative side, the products where the country has comparative advantage may have a higher pollution intensity, or may require a greater use of the country's natural resources.

Regulatory Effects. Trade reforms may have regulatory effects, that is, may have an impact on environmental regulations and standards. On the positive side, trade agreements may explicitly include measures to improve environmental standards. But it is also possible that particular provisions of trade reforms may impinge on a government's ability to set environmental protection standards.

Trade can have a range of environmental, health, and social impacts. Environmental impacts include those measured by air, water, or land pollution associated with the enterprises producing traded products. There could also be natural resource effects associated with changes in the demand for the use of natural resources, leading to either higher or lower resource depletion or environmental degradation, depending on the scale and resource-efficiency of enterprises following liberalization. In the case of social impacts, more open trade may result in certain sectors expanding and others contracting, possibly leading to a rise in inequality or loss of employment opportunities (depending on the labour intensity of sectors and enterprises shrinking or expanding following liberalization). There can also be positive effects in terms of poverty alleviation due to higher rates of trade led growth.

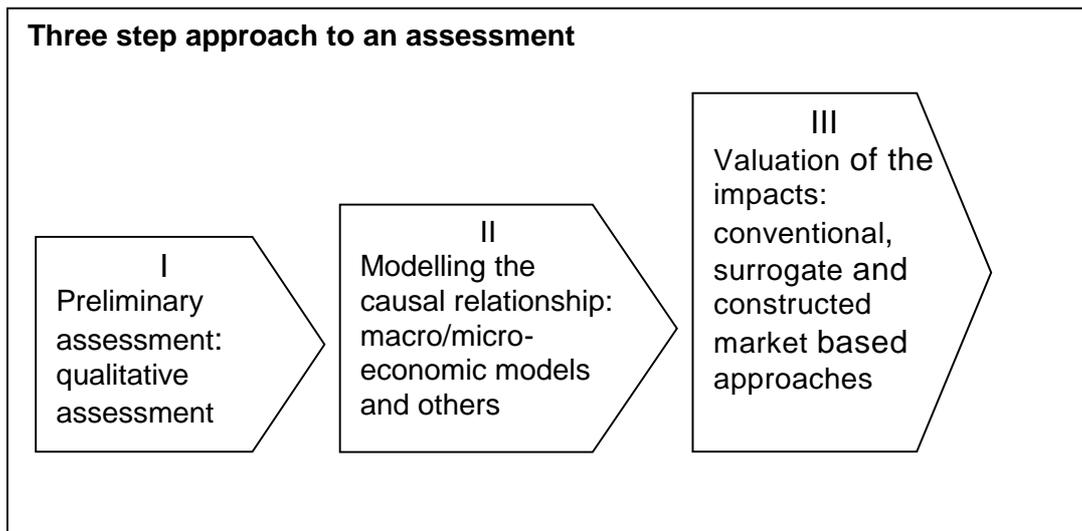
Such preliminary assessment can be facilitated by the use of simple diagram shown below. Each corresponding impacts will be filled in with signs (+++/- for significant positive/negative impacts, ++/-- for moderate, and +/- for light, and 0 for no noticeable effects).

	Product effects	Technology effects	Scale effects	Structural effects	Regulatory effects
Impact on environment					
Impact on economy					
Impact on society					

II. 2. Approaches Used to Trace the Trade-Environment Linkages

The preliminary assessment described above helps to identify, in a qualitative manner, the effects of trade on the environment. Although the next step may not be feasible in all cases, UNEP recommends to quantify and value these impacts in the following manner.

A range of frameworks helps establish causal links between available indicators and the selected significant effects identified in the preliminary analysis. There are three broad categories of frameworks; **macroeconomic models**, **microeconomic (sector-based) models** and **a group of other models**. Ideally, a methodology should be chosen which best suits the nature of the system being examined. In practice, the choice may be constrained by factors such as data availability and the user's familiarity with the model.



Any model will require a clear definition of the policy measures to be assessed, as well as identification of the impacts to be included in the model, which will typically include product, technology, structural and scale effects. The regulatory impact of trade agreements may also be considered.

Among the macroeconomic models are the input-output models and general equilibrium models. The microeconomic models include partial equilibrium models, environmental impact assessment, cost-benefit analysis, multi-criteria analysis, extended domestic resource cost approach and life cycle analysis, among others.³

II. 3. Approaches used to assign values to the effects

Once the intricate task of tracing all the major causal links of specific activities or policies on the environment is completed, the next step is the quantification and valuation of these impacts.

Valuation techniques can be classified into **conventional market-based**, **surrogate market-based** and **constructed market-based approaches**, depending on the type of indicators available to the analysts. Conventional market-based approaches include the change in productivity approach, cost of illness approach, and cost-based approaches. There has been only limited application of these techniques in the country projects described below.

III. Results from the country projects

This section presents six country projects in accordance with the UNEP framework for assessment described in the section II above. Section III.1 provides a review of elements that built the foundations of the initial assessment stage in these country projects. Section III.2 presents the results of qualitative assessment and modelling undertaken in the six country projects, by country. This section ends with a summary of the limitations to and challenges for assessment methodologies. Section III.3 provides an evaluation of the impacts, both negative and positive, revealed in each country project. Section III.4 concludes with some more generic practical and procedural lessons learned from these country projects.

³ Further discussion on these models and their application will be found in *the Reference Manual for the Integrated Assessment of Trade-related Policies*, UNEP, Geneva, 2001.

III. 1. Basic elements in designing the assessment

Focus

The focus of the country studies in this project was on specific sectors and specific trade-related policies. Some country projects dealt with tariff rate quotas or subsidies that are related to some WTO Agreements, but the reference to WTO commitments is not prominent in country projects. When examining a specific sector, it was observed that currency devaluation or market distortions, such as price distortions, had a large role to play in determining environment, economic and social effects. Compared to macroeconomic policies and trade-distorting policies, trade liberalization policies proved less influential in determining production and consumption effects and hence environmental effects. In the future work, it is recommended to focus more explicitly on WTO related commitments which may have implications for the environment in a particular sector. The country project in China is the only study in the current series to have focused on WTO-related liberalization measures.

Timing

All studies except China carried out an *ex-post* assessment. China conducted an *ex-ante* assessment.

Indicators

The country projects often used the physical depletion of natural resources as an indicator. In some cases, proxy indicators on health have been used to track the environmental effects. In other cases, rapid appraisal technique was employed for qualitative assessment and to indicate environmental effects where appropriate.

III. 2. Qualitative assessment and modelling in the country studies

China

In China, the specific policy studied is that of import liberalization rather than export expansion. The study examines the impact of tariff rate quotas (TRQ) on the production and import of selected agricultural products. Environment, social and economic effects are largely imputed through changes in production and consumption structures. The methodology used is a partial equilibrium econometric analysis called JAPA model, which seeks to examine the effects of some trade policy variables. This is the only *ex-ante* study in this series of studies, i.e. it forecasts the potential effects of the TRQ on Chinese exports and imports, on the basis of current consumption patterns and current utilization of resources.

The study on China examines the impact of TRQ offers under the US-China Bilateral Agricultural Agreement 1999. As this is a theoretical projection, two assumptions have been made. First of all, it is assumed that the bilateral trade concessions given by China to the US would have to be extended on an MFN (most favoured nation) basis to all the member countries of the WTO, subsequent to China joining the WTO. Thus its TRQ would apply to all members of the WTO. Second, it is assumed that the entire TRQ will be imported irrespective of whether imports are more or less competitive than domestic products. Subject to these assumptions the following examples have been chosen for simulation by the JAPA model.

TRQ for year 2002 according to the schedule of U.S.-China Bilateral Agricultural Agreement for:

Wheat	8.1 million metric tons;
Corn	5.58 million metric tons;
Cotton	819,000 metric tons.

Assuming that the entire TRQ is imported this increase in imports would result in a decreased cultivation of some crops. Wheat, corn and cotton imports are likely to bring significant shifts in overall crop production structures. According to the optimal solution of the JAPA model, compared with the baseline projection, the total cultivated land area will decrease by 1.11 %, or about 92,624 hectares.

Reduced cultivation is expected to bring about positive effects on the environment because of the reduction in the application of chemical fertilizers and pesticides. The reduction of pesticide application was evaluated at 0.10 million RMB, and the reduction of chemical fertilizer application was evaluated as 1.11 million RMB. This did not include, however, the reduced application that would result from effects other than reduced cultivation. For example decreased prices of agricultural products may encourage decreased fertilizer application per hectare.

However, the study also imputes negative economic and social effects to the decrease in cultivated land. If cultivated land were to be abandoned, it could be used for non-agricultural purpose, such as city extension, industry and building. The average shadow price of the cultivated land estimated by the partial equilibrium model is 155 RMB/ha which works out to total value of 14.36 million RMB for the abandoned land. The study assumes that this is a social opportunity cost rather than an environmental cost. The higher rental value of urban land, which would accrue as an economic benefit is not included in these calculations. This is justified by the study on the grounds that their model is a partial equilibrium analysis which focuses exclusively on the agricultural sector and does not examine other interlinkages with either urban expansion or related industries such as the textiles sector.

After China joins WTO, opportunity and challenge both can be found in the agricultural sector. While theoretically, China could expand agricultural exports, increased agricultural imports (TRQ) in the initial period, could have economic, social and environmental effects. According to the study the overall production of cotton would go down because of imports provided for in the TRQ, however, it is likely that textile exports and production would go up. This would thus result in increased export revenues, which have not been taken into account in calculating the economic losses arising from trade liberalization. Whether this is environmentally beneficial or harmful has not been analysed by the study, but literature does suggest that moving up the value added chain would lead to environmental benefits. At the same time it must also be recognized that textile production can be pollution intensive, and also has high water consumption demands.

Argentina

The purpose of this project was to examine ex-post the impacts of trade liberalisation policies on the fisheries sector. Dealing with a sector, which is almost exclusively export-oriented, the study provides a stark example of the environmental effects of trade liberalisation and the socio-economic impact of these changes. The methodology is based on qualitative data assessment combined with cost-benefit analysis, and the study appears to be one of the clearest studies on the counterfactual, i.e. a situation without trade liberalisation and that with trade liberalisation.

The main policies which created the conditions for a significant expansion of fishing activity and its exports from Argentina included deregulation of numerous economic activities and markets, price stabilization and dollar parity policy, easier credit availability; free movement of foreign capital and reduction of import tariffs and export taxes. This was accompanied by policies such as opening up of trade for Argentine fisheries products in previously closed foreign markets, caused in part by the diminishing resources in oceans under developed countries jurisdiction, together with a transfer of fishing overcapacity from developed countries to Argentine waters. This transfer of fishing fleets was encouraged by subsidies from developed countries, i.e. a trade distortion.

This transfer of fishing fleets to Argentine waters was brought about largely through two types of policy instruments. First, Argentina negotiated agreements with the European Union in the early 1990s to transfer fishing fleets and establish joint - ventures between EU-based and Argentine companies, operating in Argentine waters, which were also in receipt of EU subsidies. Secondly, Argentina sold temporary fishing licenses to fleets from Asian countries (notably Japan and Korea, but also South East Asian nations) for capture in waters under Argentine jurisdiction. These agreements represent a form of subsidies provided by developed countries to their fleets.

The exploitation of fisheries resources was insignificant in Argentina, until export-oriented growth took place. Indeed, consumer preference in Argentina is for beef rather than fish, the former also being less expensive in general terms. Thus, 90 per cent of the fish catch is exported to diverse foreign markets, mostly with little or no value-added. Exports increased by 478% between 1985 and 1995. Capture grew at high rates until 1997, after which it fell sharply. It reduced by 16.6 per cent between 1997 and 1998 and by 10 per cent between 1998 and 1999. Over the period between 1997 and 1999, the catch fell by 25 per cent. The decline in revenues over that period was about 14%.

The Argentina study strongly links overfishing and the related depletion of fish stocks to subsidies from developed countries for fishing overseas. It points out a clear link between these trade distortions and the negative environmental effects on the fishery sector. The study also reports a significant shift in the structure of the industry and its geographical location. Traditional fishing communities that supplied the local market lost their ascendancy to enterprises in other locations in Argentina, that developed their fishing activities almost exclusively around export of fish products.

While the vessels utilized in the past were mostly small scale largely artisanal boats with some medium sized (ice trawler) vessels involved in the activity, other types of vessels with a much larger capture capacity, mostly from the EU and Asian countries, were introduced in the early nineties. These were mainly processing ships (freezer, factory, and squid jiggers), which led to an increase in capacity of freezer fleet legally registered by more than five - fold from 1990 to 1995, also accounting for the increased depletion of fishery resources in Argentina.

Increasing and unregulated fisheries trade has had critical negative impacts on resources and on the socio-economic structure of the fisheries sector. Some of the verifiable impacts identified by the study are: degradation of the fisheries biomass (unregulated trade), and increased operation costs. Increased exports of fish also increased the fiscal burden through corruption and non diversification of catches towards species preferred by export markets. Many of these specific impacts were directly related to overcapitalization of fleet, i.e. to the changed production structure which favoured large instead of small producers, as well as harvesting with little control.

Senegal

The purpose of this project was to examine the effects of trade liberalization and other trade-related policies on the fisheries sector in Senegal. Like the Argentina study, this one provides a clear ex-post examination of the effects of trade distortions, such as the developed country subsidies, bilateral fishing agreements and preferential trade arrangements, on fish stocks in Senegal. The methodology of this study is based qualitative data assessment of the species concerned, and their biomass over a period of time. Point estimates have been used where time series were not available.

The main trade-related policies that led to a substantial increase in fishery exports, and consequently a decline in fishery resources, were the following:

- non-reciprocal advantages under the Lomé Agreements, authorizing Senegalese piscatorial products to enter the European market with the exemption of custom duties;

- export subsidy of 15%, later raised to 25%, first applied to canned tuna and later extended to all piscatorial products;
- 50% devaluation of the CFA franc, which more than compensated for subsidy suspension (also linked to devaluation);
- fishing agreements concluded with a number of foreign fleets, giving them access to Senegalese waters and fish stocks.

In the late 1980's, the poorly performing traditional fishery exports forced government interventions towards its expansion to external markets. The presence of European fleets and export firms, together with distribution networks hinged on the European market favoured this development. However increased exports were also due to the ability of small-scale fishing to adjust to favourable price signals, guaranteed market access through the ACP (preferential trading arrangement with Africa, Caribbean and the Pacific) subsidies to fishing fleets and fishing agreements with the EU.

In this context, an expansion of the capacity of both fishing units and factories took place, rather than the modernization of existing facilities. This is because most of the developed countries wanted to fish in Senegalese waters, instead of giving preferential tariffs for value added Senegalese fish products. Thus even with an ACP regime there was a tendency to export raw fresh and frozen fish rather than processed fish. The wastage rate of processing facilities was very high and the pressure on resources increased. The share of fresh or frozen whole products in total exports was much higher than that of more processed products.

Thus, the overall sale effect of trade expansion in Senegal was negative for the environment. Resource scarcity became serious for some species, particularly those such as coastal demersal species (deep lying fish) with high market value. The sector has faced serious disequilibria both in terms of resource exploitation and market supply. There is a risk of local market supply shortages in the near future as fishing effort shifts from locally consumed species to those destined for export. This has important food security implications for major segments of the Senegalese population. While the study does clearly indicate the species most at risk and quantified the stocks of those species, it did not attempt any economic valuation of the species depletion, nor of the cost of possible eventual exhaustion of stocks.

Despite the danger that stock depletion represents, the small-scale sub-sector continued to favour exports rather than domestic markets. This is because though operating costs of small scale units have increased for inshore fishing, that of coastal demersal fishing has not increased at the same rate. Thus market signals favour fishing for export markets, rather than for domestic consumption where prices are lower and costs are higher.

The dynamic scenario may however be different for the future, on account of trade preferences in international markets and especially in the EU. Presumably, Senegal will lose some of the tariff advantages that it enjoyed in the European market. This prospect seriously threatens the stability of its trade balance, which depends heavily (around two thirds of its export revenues in dollar terms) on fish exports to the EU.

Ecuador

This project examined the effects of trade liberalization on environment, economic and social effects in the banana sector. It examines three distinct periods of trade liberalization, and is thus an ex-post analysis of the effects of trade liberalization on the environment. The methodology is one of qualitative data assessment, analyzing production trends and linking it to policy initiatives. In this case fairly large time series of comparable data have been obtained.

Three distinct periods of trade liberalization have been identified by this report. The first period (1980-89) saw the adoption of a system of "mini-devaluations" with periodic adjustments to the exchange rate. This increased the prices of imported inputs and

decreased the price of the banana exports, thus improving its competitiveness. This period also experienced a fall in interest rates, a rationalization of credit to the productive sector and a policy of subsidies on credit for the agricultural sector. All this led to a sustained increase in production and export of bananas over this period.

As far as environmental effects of expanded cultivation of bananas is concerned, it is difficult to obtain exact data on deforestation related to banana cultivation. Indirect inferences can be made by looking at the data on increased agricultural expansion. Since the mid-1980's, increase in extraction of wood by small- and large-scale producers, as well as the unrestricted planting of various agricultural products (including bananas in the central and southern coastal area), have become the principal reason for the destruction of the habitats of the region. On the other hand, the natural areas, which border the cultivated areas are subject to pressures due to the extensive use of certain resources, specifically the selective extraction of wood. Thus the destruction of natural habitats cannot be entirely attributed to the trade expansion policies for banana exports.

The introduction of new varieties of banana in the 1980's, did not generate a positive technology effect as it did not lead to a more efficient use of natural resources or to an increased use of technology by the workforce. The returns to banana producers increased over the 1980's on account of guaranteed minimum export prices. However, costs of inputs registered a sharp increase over the decade with the result that the trend rate of increase in profits was a modest 0.4% per annum over the decade. Small producers have rarely made a profit, and in most years they ran losses.

The second period, 1990-1994, saw quantitative restrictions being replaced by customs duties, resulting in increased market access for six thousand items. The lists of exceptions to market access requirements were also reduced. The system of advance payment of 80% of all customs duties for imports was suspended, and the adoption of a common customs duty structure in the Andean Community of Nations with four customs duties levels 5%, 10%, 15% and 20% for products not originating in the region was instituted. This resulted in the import of capital goods and new technologies in the banana sector thus improving its productivity. During this period banana plantations grew at an average rate of 18% which was significantly higher than the previous decade. The substantial increase in cultivated area resulted in an increased use of natural resources as well as a decrease in bio-diversity, constituting a negative environmental effect.

Pricing policy during the 1990's has been variable and at the same time, favourable for banana producers in some instances. Since 1993, the government periodically fixed the *minimal procurement prices*, i.e. the prices that exporters were obliged to pay banana producers. The government also moved to an exchange rate policy (fixed band) which would ensure that the prices of capital goods or technologies did not become excessively expensive. This ensured that the cost of production was kept to a minimum.

During the period 1995-1999, reforms of fiscal and monetary policies were introduced. Complementary economic agreements with Chile and Argentina in 1994, Ecuador's entry to the WTO in 1995, and complementary economic agreements with China and Japan in 1996 were also important in improving market access for bananas from Ecuador. These occurred at the same time that important trade and environmental policies and regulations came into place. In 1994, the Environmental Security Regulations for the Banana Sector, the Plant Quarantine Handbook, the Export Facilitation Law, plague control norms, packaging norms, and the banana policy for plantations re-conversion were implemented. In 1995, norms to diversify markets and varieties of the fruit and to control packages and bails were established. The Plant Health Regulations and the Environmental Management Law were passed in 1998 and 1999, respectively.

The result of the application of these laws has been evident since 1995, particularly in the lack of expansion of the area under banana cultivation, despite a steady increase in

output and exports. The majority of banana-producing provinces have maintained relatively constant cultivated surface area totals in recent years, and some provinces have even considerably reduced their cultivated surface area. In this case, the increase in exports may not have generated any additional environmental burden. The study attributes this to improved technologies, appropriate macroeconomic climate, i.e. flexible exchange rate policies, and most important appropriate environmental policies.

The diverse price policies aimed at adjusting and fixing the minimum referential price for bananas resulted in the increased profitability of the banana plantation activity. However, it is important to take into account that the production prices, costs, and income are directly linked to the technological level of the plantation. In addition changes in input prices were determined by exchange rate fluctuations. Thus while the minimum referential price has increased a few times, production costs have constantly increased. Hence, SME producers have seldom been able to cover their production costs and even less able to generate a profit from the activity.

As far as the terms of trade are concerned, they are completely different for the banana exporters as compared to the producers. During the last decade, exporters generally made a profit, whereas producers rarely made a profit. Wages for banana labourers generally kept pace with agricultural wages.

In Ecuador, in the 1980's, a high percentage of banana production came from non-technology-based farms. The technology structure of the farms also changed as a consequence of trade liberalization. Plantations became more technology intensive by the end of 1990's. However, the majority of the plantations by this date were less than 30 ha, i.e. they ranged from small to medium sized farms. In the study high-technology farms have generally been associated with better environmental management, though not necessarily with higher productivity. Paradoxically, productivity increases during the 1980's were higher than during the 1990's.

In general terms during the three periods studied, banana production affected the environment in the following ways: loss of biodiversity, alteration of water, soil, and air quality, accumulation of toxic waste and non-degradable material. Furthermore, some other social indicators were also negative. The alteration of the health of banana workers and of people who live in neighbouring areas of the plantations is a demonstration of this fact. During the last several years, many of these impacts have been reduced by means of initiatives such as: national regulations, international regulations as established by multilateral agreements, such as the Convention on Biological Diversity, and the FAO's International Undertaking on Plant Genetic Resources, as well as appropriate market mechanisms.

Tanzania

This project examined the effects of trade liberalization on the forestry sector. Economic and social effects along with deforestation have been examined in this study. The methodology used has been one of qualitative data assessment, and data over a sufficiently long time was available for this study. The researchers however had little access to data on specific domestic and export uses of the forestry sector which made it difficult to infer the link between trade expansion and deforestation. The analysis is an ex-post analysis and was validated by primary data collection wherever possible.

Specific trade liberalization measures that have directly or indirectly impacted on forest sector include; elimination of price controls and introduction of market based prices, abolition of export tax, and abolition of the export licensing system. All these policies led to a significant increase in exports of forest based products. The elimination of the requirement of registration of exporting companies, introduction of retention scheme in late 1980s which allowed exporters to retain an increasing share of their export proceeds to finance their imports, rationalization of import tariff rates and abolition of import licensing led to increased import of better technologies of wood production.

Following trade liberalization, there has been an increase in the production, distribution and marketing of forestry products of Tanzania. This is reflected in increased growth of the share of forestry products (both domestic and exports) from 2-3% of total GDP prior to liberalization, to about 10% after liberalization. However, exports of forest products as a proportion of GDP according to the estimates provided by the study was very low (around 1%). The increase in production of forestry products has however led to an increase in the rate of deforestation. Although the exact rate of deforestation is not accurately known, the rapid increase of the phenomena is indisputable.

The most comprehensive measurement of deforestation is based on the assessment of tropical forests and woodlands conducted more than two decades ago by FAO within the Global Monitoring System (GEMS) which estimated deforestation rate for the period of 1978-1980. The rate of deforestation in Tanzania for that period was at 130,000 ha annually. Another estimate was made in 1983 by the Forest Division, which came up with the figure of 300,000-400,000 ha of forest being lost annually through deforestation. Beginning the early 1990s the estimates have gone up to 500,000ha of forests being lost annually. It is worth noting here that the debate has been more on the figures than the trend, and most of the reports in this area admit that deforestation is increasingly becoming a threat. However, not all this deforestation can be linked to trade expansion.

The study in fact shows that the contribution of exports of forest products to the total GDP generated from this sector is low. Thus while exact estimates are difficult to come by, it is likely that trade expansion has had little direct effects on deforestation. The effects could be indirect through changes in production structures caused not so much by trade liberalization, but more by factors such as the construction boom due to investment liberalization.

The positive impact included; increased value added in forest products mostly because of the use of wood for construction purposes in the domestic markets, import of machines used in the sector, and technology impacts in form of increased availability of equipment. These have resulted in changing production patterns, from wood to finished products, increased market price of the traded forest products because of value addition, and increased contribution to the GDP specially through the use of wood in the construction sector, increased investment growth, and increased employment. However, the study also points out that increased activity in the forest sector led to a lot of wastage of wood. Appropriate flanking policies as well as technologies to reduce this wastage have not as yet been put in place.

The negative impacts associated with the same policy measures are due to the results of increased intensity of the economic activities in the sector triggered by demand for forest products from other expanding, export-oriented economic sectors. These indirect effects of liberalization include: loss of soil fertility thereafter accelerating undesirable farming practice like shifting cultivation, decline of forest productivity in a given area because of depletion, decline in productivity particularly of agricultural sector, increased forest invasion and social migration to the forest margins, increased human health problem.

Nigeria

The project has examined the effects of trade liberalization on the environment, trade and economic aspects of the cocoa and rubber sector. The project is based on extensive qualitative data assessment and a cost benefit analysis. The study is an ex-post one and examines the effects of macroeconomic policy reform, including trade liberalization on the cocoa and rubber sectors. The results of the study have been crosschecked by a rapid rural appraisal methodology.

The overall objectives of Nigeria's trade policy include:

- the integration of the Nigerian economy into the global market through the establishment of a liberal market economy;

- promotion and diversification of exports in both traditional and non – traditional markets;
- promotion of the transfer, acquisition and adoption of appropriate and sustainable technologies to ensure competitive export – oriented industries, among others.
- Successive devaluations which contributed to making exports from Nigeria more competitive

As a result of these policies both production and export of cocoa and rubber, increased. However in the case of cocoa because of excess capacity in this sector, environmental effects were not negative. New areas were planted to cocoa before the structural adjustment period (SAP) more than during SAP but the rate of abandonment of cocoa farms fell sharply during SAP as farmers recommenced management of existing cocoa plantations, to boost production. This may have had a beneficial environmental effect in terms of better ecosystem management.

In the case of rubber however, there was an increasing trend for new areas to be planted to rubber during and after the SAP period. Over-tapping (slaughter tapping) of rubber led to early destruction (death) of the rubber trees and exposed the soil to processes of degradation. Most trees that dried up as a result of slaughter tapping were then used as fuel wood and/or were not replanted, thus reducing soil cover, with negative consequences for nutrient cycles, soil erosion rates and the ecosystem more generally.

The import of fertilizer and fungicides rose sharply during the SAP period rather than the pre-SAP period but that of fungicide declined after the SAP period. Chemical input prices have been rising sharply, partly because of the continued depreciation of the Naira since the SAP period, but the prices of cocoa and rubber declined after SAP and hence lowered the demand for agro-chemicals by tree crop farmers. Even though farmers indicated that the agro-chemicals are important for increasing output, the high prices of agro-chemicals relative to those of export crops led to little or no demand for agro-chemicals.

The results of this study show that economic liberalization had no perceptible influence on the environment in the case of cocoa. It must be realized that this appears to be so simply because the response of farmers to the incentives created by the liberalization policies was more of rehabilitation of existing farms, rather than further expansion of cultivated area. Were the response to be accompanied largely by expansion in plantation, this action would obviously have a negative impact on the environment since forest, land and ecosystems in general would have been disturbed. The need for macroeconomic policies to have a built-in mechanism to ameliorate or quickly arrest unwanted environmental effects is clear. The result of this study also shows that the use of agro-chemicals by farmers has been low, not only because of the escalating prices of agro-chemical inputs, but as a result of farmers' reliance on traditional agronomic practices and a farming system approach that tends to enhance the management of the ecosystem.

III. 3. An overview of assessment

The country studies show that the environmental effects of trade liberalisation varies according to the policy regime as well as the sector studied. In the case of the fisheries sector which is mostly export oriented (two thirds for Senegal and 90% for Argentina) it was possible to make direct links with trade expansion. It is to be noted that these two cases could be classified as a response to trade distortions introduced in the shape of distant water fishing access agreements, rather than a consequence of trade liberalisation. Solutions to reducing the negative scale effects in this case would therefore lie in negotiating more rational fishing agreements rather than reversing trade liberalisation, or more rational fishing policies. The calculation of maximum sustainable yield would help in formulating quotas which can be then used in the conclusion of fishing agreements.

Import liberalisation may lead to both negative and positive environmental effects. Some other effects such as economic savings stemming from lower chemical usage are relatively easy to estimate. Evaluating the environmental benefits of setting aside land or leaving agricultural land fallow has proved a major challenge in the case of developing countries such as China. It is much easier to estimate the social loss resulting from decreased employment. Shadow pricing techniques have thus been more useful in estimating the social opportunity cost of land used for agriculture rather than the opportunity cost of land set aside for environmental benefits. This is an area which requires further work in the context of developing countries.

Delinking the environmental effects of trade expansion and economic expansion has proved a major challenge. Data on deforestation for example do not clearly list how much of the deforestation is due to expanded trade and how much is due to expanded economic activity. It is also difficult to get accurate data on deforestation. In Ecuador, for example while it was possible to estimate the expansion in banana cultivation, it was not possible to obtain data on the deforestation directly associated with banana cultivation. That had to be imputed indirectly. The environmental effects were indirectly measured, and it was projected that increased cultivation would have negative environmental effects because of increased use of fertilisers and pesticides. In Tanzania as well it was difficult to distinguish the effects on deforestation of increased construction and increased consumption of fuel wood from those of expanded. It is estimated from figures on value added that the consumption of wood by the domestic sector was quantitatively much more significant than increased exports of forest products.

The studies also point to important attenuating factors in mitigating negative environmental effects. In Nigeria, the existence of excess capacity in the cocoa sector generated no negative, and even some positive environmental effect from increased exports. Conversely, slaughter tapping induced in the rubber sector because of the need for increased exports generated negative scale effects.

Cross country comparisons thus do not yield any systematic patterns either of methodology, or environmental effects consequent to policy liberalisation. The specific sectoral situation, the overall policy environment, and more importantly the external market realities are important in determining whether environmental effects of trade expansion would be positive or negative.

In general the product composition and technology effects tend to be positive as a consequence of trade liberalisation. However, the distribution of the gains from trade may be skewed against small-scale producers. They may additionally favour traders over producers, though wages may rise generally. The overall social effects of trade liberalisation need a more detailed study. These country studies have pointed to some ameliorative social policies, such as minimum floor prices for producers and taxing of traders income, which could be implemented. However, a more in depth study is required.

As far as environmental effects are concerned, except for the fisheries case, changes in production structure did not cause significant environmental effects. In the fisheries case the composition in Argentina changed from small-scale artisanal vessels to large fleets leading to excessive fishing. In Senegal, small-scale fisheries also found export markets more attractive financially than domestic markets. In fact Senegal fears a change in EU's market policies as this may decrease its foreign exchange earnings significantly. Senegal clearly outlines the dilemma for a developing country where short term gains are difficult to write off even if there are long term benefits of sustainable fisheries. This is a clear case where ameliorative measures such as technical assistance, higher prices and moving to higher value added products could help maintain sustainable fisheries in Senegal.

III. 4. *Evaluating different effects of trade liberalization*

Most of the studies have attempted to evaluate different effects. The study on China shows that in a cost benefit analysis (CBA) framework, the negative economic and social effects would be higher than the positive effects. This perception is also based on the fact that

Chinese imports of agricultural products are not likely to be balanced by Chinese exports of agricultural products, as standards in export markets may be exacting and difficult for China to meet. The study does point out that the revenue generated from a 5% increase in exports of textiles would be greater than the net economic and social losses calculated from the CBA. It also points out that the possible benefits to linked industries such as animal husbandry have not been examined by the study, as these could also be positive.

In Argentina, a cost benefit analysis (CBA) solely for the species of fish that were overexploited in the study period, shows that trade liberalization had a significant negative economic effect. The quantifiable economic costs and gains, evaluated through a CBA, indicate that the policy situation of the 1990s (that is, fishing activity uncontrolled as well as lacking adequate economic instruments) has implied a net direct cost of about US \$500 million for the most exploited species. The same sort of CBA was carried out for a hypothetical situation defined as respecting maximum sustainable yield (MSY). If this parameter had been respected, a net benefit of about US \$ 5,100 million would have accrued. The evaluation of the environmental costs is mostly qualitative with an exact quantification of a broad range of species loss, though not of its economic value.

In the case of Senegal, since most of the positive benefits of trade expansion such as technology development and increased value added were not experienced, the effect was predominantly negative on the environment. Although various measures of declines in catches and fish stocks have been provided, at this point no economic valuation has been made.

In the case of Ecuador, there were two opposing effects of trade policies on the environment during the 1990s. The substantial increase in cultivated area resulted in an increase in natural resource use as well as a decrease in bio-diversity, amounting to a negative environmental effect. However, the substantial technological improvement, particularly the incorporation of environmentally friendly technologies had positive environmental effects. Simultaneously, the introduction of environmental policies had a positive effect. Whether these different effects balance each other resulting in an environmentally neutral situation is difficult to determine. It seems however that in the 1980's trade liberalization may have had a negative impact on the environment. It is however important to note that when the government put in place new environmental policies in 1990's, as well as favourable macroeconomic policies such as the Export Facilitation Law. Plague control norms, packaging norms, and the banana policy for plantations re-conversion were also implemented. This led to reconversion of plantations to forest land or to organic farms. In 1995, norms to diversify markets and varieties of the fruit and to control packages and bails were also established. The combined effects of these policies appears to have reversed the trend towards increased negative impacts on the environment.

In the case of Nigeria the net effects of trade liberalisation appear to have been environmentally neutral. A number of other factors, tended to minimise the negative effects of trade expansion, or render them positive. Most of these have to do with the existence of unused farms in the cocoa sector, traditional farming practices which did not favour the use of agrochemicals, and constant devaluation which led to increased prices of agrochemicals and its consequent decreased usage. Thus in this sector there were indications of a win-win situation, in which trade expansion was simultaneously environmentally beneficial. Conversely, expansion of rubber production resulted in negative environmental effects.

In the case of Tanzania, while rates of deforestation and associated environmental degradation have grown, linking it to trade expansion or trade liberalization is close to impossible. This is because while production of forest products expanded rapidly, the share of exports in total GDP generated from this sector continued to remain very low.

III. 5. *Some lessons learned from the practice of assessment*

Some preliminary, general lessons about the conduct, evaluation of results from, and design of policy responses to assessments are beginning to emerge. The ones cited below

provide some of the more important preliminary insights. These will be elaborated upon in the more complete synthesis of these country projects that will be produced once the projects are finalized.

Timing

So far most of the projects conducted have largely been focused on ex-post assessment of the effects of trade liberalization and other trade-related policies. However, **the value of ex-ante assessment** of trade-related policies as a means to enhance policy integration was demonstrated by the case study on China. In that sense, a periodic monitoring of the countries studied could lead to a comparison of ex-ante and ex-post effects.

Data limitation

In most cases other inter-linked economic issues are only marginally examined, perhaps because of the difficulty of obtaining data as well as the complexity of these interlinkages. The country studies suggest that the data requirements of even the most well known methodologies, such as those laid out in the *Reference Manual*, proved demanding and the necessary data sets are not easily accessible in developing countries.

It is therefore necessary to develop simpler methodologies such as rapid appraisal or data analysis, including causation analysis, to provide an alternative to more sophisticated methodologies which may be difficult to apply in developing countries. Data constraints encountered in the studies made it difficult to get more than qualitative impressions of the identified impact. In this case it may be necessary to link qualitative impacts with proxy indicators or ranking methodologies to estimate environmental effects.

Valuation has proved to be a major challenge in the country studies, as again the traditional methods in economics such as shadow pricing, contingent valuation etc have proved difficult because of the lack of data. The only method used is the direct economic losses associated with species depletion and perhaps this methodology as well as proxies for arriving at direct or indirect loss of benefits associated with environmental degradation should be further studied.

Cross-sectoral effects of trade liberalization

A number of the country projects demonstrated that there are important trade-offs between environment and economic effects. In the four projects other than the two on fisheries, environmental effects were deemed relatively insignificant in comparison to economic gains. Some of the projects, notably the China study, suggested that negative economic and social impacts in one liberalized sector, may be balanced by related positive ones in another sector, but this possibility was not examined in any of these wholly sectoral country projects.

Correlation of different effects

Generalizing across countries is difficult and the same policy under different circumstances may have both positive and negative effects. As both negative and positive effects ensue, it is necessary to focus policies on mitigating negative and enhancing positive effects. The only problem with this decentralized approach is that the same policy e.g. reduction of customs duties may lead to import of improved technologies but also increased exploitation of forests through increased production of forest products. This would thus generate a positive technology effect but a negative scale effect. In fact this was empirically observed both in the case of Tanzania and Ecuador. In the case of Ecuador the negative scale effects were countered by new land management laws, which prevented increases in cultivated land and through appropriate environmental policies. This indicates the value of flanking policies in securing sustainable development.

Impacts of policies other than trade-related ones

The assessment work to date has underlined the need to **assess the environmental effects of other macroeconomic policies** such as devaluation, commodity price

stabilisation, preferential trading arrangements etc as these also often have significant implications for trade, environment and sustainable development.

These country projects suggest that appropriate interventions would frequently address appropriate development, value addition, market diversification, and macroeconomic policies rather than trade policies or even environmental policies. Trade policies so far identified as bringing environmental benefits are those which reduce trade distortions such as tariff escalation, thereby enabling the countries to move to higher value added and lower rates of exploitation of natural resources. Where trade expansion has been the major cause of environmental degradation, trade distorting policies have had a large role to play in it. In these cases less trade distorting policies would also protect the environment.

Monitoring and evaluation

Implementation of policy packages, even at a pilot level is key to the success of these studies. As much effort needs to be put into implementation, and identifying the challenges to implementation, as into the assessment of environmental and other impacts of trade-related policies. This implies engaging senior decision-makers at an early stage in the assessment process, enabling them to see its inherent value and also develop some ownership of its ultimate policy product.

IV. Next steps and policy responses

Various policy proposals have been put forward as a direct result of conducting these assessments. The country studies arrived at a mix of environment, macroeconomic, and other policies to improve export competitiveness. The diversity of solutions proposed to the environment, economic and social problems generated by trade liberalization emphasize the specific country situations as well as their institutional structures.

China

Predictably, as the most important problem identified by China was the negative economic effects of its WTO accession, the solutions also were economic in nature. An important priority of China was to improve the competitiveness of its cotton sector. For this it proposes to introduce permitted subsidies, improve its cotton breeding program, encourage the formation of cooperatives, and various other measures.

Maintaining the balance between supply and demand, and avoiding fluctuations was also considered an important part of its strategy. This balance includes regional balance and varietal balance. The study also recommends that integrated pest management techniques, use of traditional herbs, and decreasing use of water and other agrochemicals be applied. The study however does not recommend a comprehensive set of instruments that could be used for this purpose.

On environmental policies, the study strongly recommends that assessments, especially general equilibrium (GE) assessments be carried out. However, even if data for a comprehensive GE analysis may be difficult to obtain it is necessary to examine some of the interlinkages with other related sectors, especially livestock and textiles, which would benefit respectively from reduced prices of grain feed and cotton. As this is an ex-ante analysis it would be interesting to monitor the actual developments in these sectors as WTO accession commitments are implemented, to compare actual effects with ex-ante assessments. Pilot implementation of some of these policies can also be carried out in the meantime.

Argentina

The thrust of the policy package according to the Argentina study should be to maintain natural resources at adequate levels to sustain long-term exploitation while generating revenue and productive employment.

A policy package of this type would, therefore, need a multi-level policy coordination and implementation as well as the judicious use of economic instruments. The study recommends that the economic instruments used should result in changes in the structure of production of the fisheries sector. It is also proposed to alter the current export structure from a commodity type to one that is based on value-added. However, the study recognizes that exporting value-added products may be difficult because of market access barriers such as tariff escalation. It therefore recommends a thorough study of the production chain to understand the international dimensions of the market.

The study notes that although a quota management system was prescribed by law in 1997, the design of a quota system has only begun recently. The use of individual tradable quotas (ITQs), could therefore be introduced to protect Argentina's stocks of fish. However, the full design, implementation and application of this innovative type of instrument is one of the major challenges in policy-making in the near future, in particular because there is little knowledge or experience with the use of such instruments to date, particularly in developing countries. Furthermore, the application of quotas in the Argentine case would be complicated by the fact that they would be applied in a context of a scarcity of some fish stocks. This would also make it difficult to introduce markets for tradable quotas. Hence, pilot testing of these instruments would be appropriate. It would also represent a good basis so as to provide recommendations on the use of such instruments in other countries, especially Senegal.

A series of measures are being applied and need to be expanded in order to maintain resources at a level that can be efficiently and equitably used. Measures such as fines for exceeding quotas, upgrading control methods, procedures and strategies; regulate gear used for fishing; and expanding control procedures, are some of the measures that need be applied to forestall collapse and unsustainable use of fisheries resources.

Senegal

The study recommends that fishing agreements concluded with foreign fleets be amended by increasing access prices, and in cases where fish stocks are seriously depleted, such agreements should not be renewed. Other possibilities would be to limit agreements to species which are in relative abundance, to increase the price of licenses, or to establish a collective quota system.

Differential fuel prices could be introduced for small enterprises versus large fleets, so that local employment and supply of the domestic market would be preserved. Regulations concerning the kind of nets used as well as fishing zones should be strictly enforced, and new regulations especially on endangered species should be imposed. In contrast to the proposal by Argentina for the establishment of a system for trading quotas, Senegal proposed to distribute quotas between communities through multistakeholder groups.

Finally, a set of policies to add value to the fisheries product is proposed. This includes: increased infrastructural investment; grant tax and customs advantages in proportion to the value-added of a product; financial incentives notably in terms of credit to facilitate acquisition of technologies adapted to industrial and small-scale processing; and market diversification away from Europe to Africa and Asia.

Ecuador

Currently, one of the most widespread measures being used to address the environmental effects of banana production is the development and application of environmental certifications. Several environmental certification programs have been adopted by some banana companies, including the ISO 14001 standard and the Eco-OK Program. In terms of organic certification, the banana industry works with Organic Crop Improvement Association International, Inc. (OCIA), of the United States, which operates primarily in the El Oro province, and Eco-Cert, based in Germany and Italy,

which operates in the Guayas and Los Ríos provinces. Fair trade certification also offers an important avenue for exporting bananas at fair prices. These programs combined economic gains with environmental benefits and were thus adopted readily by banana plantations.

The study also recommends a range of economic instruments that can lead to the development of environmentally friendly plantations, both on the supply and the demand side. On the supply side the study recommends that tariffs on import of cleaner technologies as well as taxes be reduced. The study also recommends easier credit lines, higher procurement prices, environmental certification, group certification for small and medium enterprises as well as policy support for them, and capacity building as well as institution building. It lays particular emphasis on implementation mechanisms and on institution building for this purpose. No specific environmental policy is recommended by the study. Testing the implementation of some of these instruments, including the supportive structures or the flanking policies needed to implement them, could be usefully examined in the next phase.

Tanzania

In order to minimize the negative impacts of the trade liberalization and the related policies in the forestry sector and at the same time enhance the positive impacts of the same, this study recommends some policy packages which include the following policy instruments;

- Pollution Control Agreements
- Forest Product charges
- Control Licenses given to operators in the forests
- Certification for products from sustainably managed forests
- Increase environmental fines/penalties to reflect the magnitude of the damage.

It is also interesting to note that the study proposes the creation of a Task Force with the mandate to implement the policy package outlined above. It is hoped that the combination of these policies would lead to a more rational exploitation of forestry products.

The Task Force formed should have members from: the Forestry and Beekeeping Department, Vice president's Office (Environment division), Ministry of Trade and Industry, Ministry of Local Government, National Environmental Management Council, Centre for Environmental Economics and Development Research and other stakeholders such as the private sector.

Nigeria

Macroeconomic policy initiatives that have significant implications for natural resource utilization must incorporate strategies to curtail unintended consequences on the environment. Some of these policies could be as follows:

- The Ministry of Environment, along with the Cocoa Development Unit (CDU) and Ministry of Agriculture could put in place a control mechanism to advise on and monitor the rate of expansion of export crop farms, and also give incentives for replanting old trees so as to be able to dissuade farmers from unprofitable and environmentally degrading practices. This could be in the form of easier loans.
- Introduce an effluent charge on pollutants arising from the activities of rubber processing industries. This should be monitored by the Ministry of Environment, which could also set minimum charge and maximum level of permitted effluents.

- The Federal Ministry of Environment could recommend the imposition of tariffs on selected products especially agro chemicals as it may help to control unregulated imports and indiscriminate use of these products.
- There is the need to encourage research institutes especially Cocoa Research Institutes of Nigeria (CRIN), Rubber Research Institute (RRIN) and universities to develop cocoa and rubber varieties that are much more resistant to some of the major diseases for which pesticides are used. Moreover, appropriate Integrated Pest Management (IPM) control methods for cocoa and rubber could be developed to reduce the environmental problems associated with any increases in hectarage of these crops in future. Furthermore, high yielding varieties should be developed to increase the productivity and income of farmers, which will limit increases of crop hectarages so that pressure on the environment will be reduced.
- A Farm Development Advisory System (FDAS) should be established to advise producers of cocoa and rubber on appropriate environment friendly techniques which are simultaneously profitable.
- Development of infrastructure such as roads, water supply, health centre schools, etc. in export crop producing areas to serve as incentives/encouragement to farmers could minimize the negative environmental impacts of trade liberalization. This is because better infrastructural development would increase value addition opportunities, by reducing transport costs and costs of washing cocoa which is expensive in cases where water has to be obtained from long distances. Increased value added may in turn reduce the tendency for unsustainable exploitation of cocoa and rubber plantations. Improving social infrastructure would have beneficial social effects (for example, on health and literacy of plantation workers).

V. Conclusions and Recommendations

All the country projects have shown that trade expansion which is consequent upon either structural adjustment policies or trade liberalization has both negative and positive effects on the environment. In most cases however, these studies indicate that the economic and social effects of trade expansion are more significant than the environmental ones. The studies underline the importance of these assessments in understanding the static and dynamic interlinkages between different economic sectors, different economic agents and the environment. Most of the measures identified to alleviate environmental, economic and social problems include a mix of sector-specific policies, broader macroeconomic policies, and environmental policies. The only trade policy identified in this regard was measures that promote higher value addition of exports.

The country studies also suggest that an integrated treatment of policies underpinning economic development may do much to enhance the viability of policies directed towards the environmental and social aspects of sustainable development in these countries. The policies to be considered should include not only macroeconomic balance and stability, but also pay due attention to infrastructure, and incentive structures for development. For example, devaluation will need to be balanced with higher value added for which incentives such as tax rebates would be required. In addition improved infrastructure would be needed to build a competitive export structure. In several cases, commodity price stabilization, skewed preferential trade agreements and other such factors may also need to be corrected before the right balance between trade, environment and development can be achieved.

Coordination at the national level between government line ministries, industry and non-governmental organizations must be actively encouraged if the policies advocated by the studies are to be implemented, even on a pilot basis. There is no shortage of in-country expertise to identify trade-environment problems and design responsive policies. However, there is a need to build an awareness of the different effects for informed policy making.

It is to be noted that these are preliminary results of the country case studies, many of which need to be further refined. Nevertheless, there is already an opportunity to initiate implementation of some of the policies recommended by the country studies, on a pilot basis. It is hoped that the stakeholder buy-in generated during the process of the assessment will help some of the countries to begin this work soon.

Outputs from these assessments have already been used in the development of the UNCTAD Train for Trade course on trade, environment and development. They can also serve as valuable models for countries involved in similar exercises in the framework of the UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development (CBTF). This task force is already providing capacity building for environmental and integrated assessment of trade-related policies, and on design of appropriate policy responses to such assessments.