Sustainability impact assessment of proposed WTO negotiations. Final report for the fisheries sector study

SUSTAINABILITY IMPACT ASSESSMENT OF PROPOSED WTO NEGOTIATIONS

FINAL REPORT FOR THE FISHERIES SECTOR STUDY

Prepared by U. Kleih, P. Greenhalgh and A. Marter
Natural Resources Institute, University of Greenwich, UK
with Nigel Peacock, NAP Fisheries, UK

In Association with:

Impact Assessment Research Centre
Institute for Development Policy and Management
University of Manchester, UK

Final Report: 10 July 2006 (revised)

This Report was prepared with financial assistance from the Commission of the European Communities. The views expressed herein are those of the Contractor, and do not represent any official view of the Commission.

This Report has been prepared for the European Commission under Framework Contract No Trade 01/F3-1 (Sustainability Impact Assessment of Proposed WTO Negotiations) Specific Agreement No. 4.

Project Reports and information about the project are available from the project website:

http://www.sia-trade.org

Table of Contents

Tables

Boxes

Figures

Appendices – Country case studies (available as separate documents)

Appendix 1:	China - NRI
Appendix 2:	European Union – NAP Fisheries and NRI
Appendix 3:	Ghana, - Victor Antwi et al, Baafie Consult, Accra, Ghana
Appendix 4:	India - Venkatesh Salagrama, Integrated Coastal Management, Kakinada, India.
Appendix 5:	Japan and USA – NRI
Appendix 6:	Peru - John Tilman, Lima, Peru
Appendix 7:	Seychelles – Nigel Peacock, NAP Fisheries
Appendix 8:	Thailand - Nigel Peacock, NAP Fisheries
Appendix 9:	Uganda - Boaz B. Keizire, Department of Fisheries Resources, Uganda

Abbreviations

ACP	African Caribbean and Pacific
ADM	Anti-Dumping Measures
AGOA	Africa Growth Opportunity Act
APEC	Asia-Pacific Economic Cooperation
ASCM	Agreement on Subsidies and Countervailing Measures
CBD	Convention on Biological Diversity
CCA	Causal chain analysis
CFP	Common Fisheries Policy
CSR	Corporate Social Responsibility
CTA	Technical Centre for Agricultural and Rural Cooperation ACP-EU
DDA	Doha Development Agenda
DEFRA	UK Department for Environment, Food and Rural Affairs
DFID	UK Department for International Development
DG	Directorate General
DWF	Deep-water Fleet
EBA	Everything but Arms
EEZ	Exclusive Economic Zone
EFF	European Fisheries Fund
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FDA	Food and Drugs Administration
FIFG	Financial Instruments for Fisheries Guidance
FOB	Free On Board
FPA	Fisheries Partnership Agreement
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GFT	Government Financial Transfers
GoG	Government of Ghana
HACCP	Hazard Analysis Critical Control Point

IARC	Impact Assessment Research Centre
ICTSD	International Centre for Trade and Sustainable Development
IDPM	Institute for Development Policy and Management
IFPRI	International Food Policy Research Institute
ITC	International Trade Commission
JETRO	Japanese External Trade Organization
LDC	Least Developed Country
LIFDC	Low Income Food Deficit Country
MCS	Monitoring, Control and Surveillance
MEA	Multilateral Environmental Agreement
MFN	Most-favoured-nation
MOU	Memorandum of Understanding
MSC	Marine Stewardship Council
MPEDA	Marine Products Export Development Authority
NAMA	Non-agricultural Market Access
NACA	Network of Aquaculture Centres in Asia Pacific
NGOs	Non-governmental Organizations
NRI	Natural Resources Institute
NTB	Non-Tariff Barriers
NTM	Non-Tariff Measure
ODI	Overseas Development Institute
OECD	Organization for Economic Co-operation and Development
P, M and E	Prevention, Mitigation and Enhancement
PPP	Public Private Partnerships
RFMO	Regional Fisheries Management Organisations
ROO	Rules of Origin
S & DT	Special and Differential Treatment
SCM	Subsidies and Countervailing Measures
SEM	Seafood Exporters Association of India
SIA	Sustainability Impact Assessment
SIFAR	Support unit for International Fisheries and Aquatic Research
SOFIA	State of World Fisheries and Aquaculture, FAO
SPS	Sanitary and Phytosanitary Measures
TAC	Total Allowable Catch
TBT	Technical Barriers to Trade
TOR	Terms of Reference
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WHO	World Health Organization
WITS	World Integrated Trade Solution
WTO	World Trade Organization
WWF	World Wide Fund for Nature

Executive Summary

Overview

The Natural Resources Institute (NRI) of the University of Greenwich is sub-contracted by the Impact Assessment Research Centre (IARC) of the University of Manchester to undertake a Sustainability Impact Assessment (SIA) of WTO Negotiations – Fisheries Sector Study. The study is funded by the European Commission in Brussels (DG Trade) and the current report reflects work undertaken during the second phase of the study.

The overall objective of the study is to assess the potential economic, social and environmental impacts of trade measures arising from the Doha Development Agenda (DDA) negotiations that have an impact on fisheries production and trade. These trade measures include:

- Market access (i.e. tariff and non-tariff measures) as part of the negotiations on non-agricultural market access (NAMA);
- Subsidies to the fisheries sector in different forms, which are being discussed by the WTO Negotiating Group on Rules; and
- Other trade issues, e.g. SPS and TBT issues and services incidental to fisheries.

The economic and fishery context for the analysis relates particularly to the rapid expansion in fisheries catch, production of processed products and trade over recent decades, notably the expansion in value of trade i.e. from about US$ 15 billion in 1980 to US$ 63 billion in 2003, with developing countries as a whole contributing approximately 50% of the total. Projections point to a further expansion of production (especially from aquaculture sources) and trade. At the same time, capture fisheries is an industry in crisis as the natural resource limits of the oceans, coastal regions and many inland water bodies have been reached in that about two thirds of the world's major fisheries are either overfished or fully fished.

A broad methodology, which is based on causal chain analysis (CCA), has been prepared by IARC for the Sustainability Impact Assessment (SIA) and already applied for similar studies covering the agricultural, forestry and other sectors. The fundamental focus of causal chain analysis within the study is to analyse effects arising from changes in existing trade agreements (or from new agreements) with respect to their impact (i.e. in terms of economic, social, environmental and process indicators). In the context of fisheries trade it is important to bear in mind that preserving the very resource base (fish stocks in this case) is a condition *sine qua non*, i.e. without which long-term economic and social development in the sector would not be possible.

Causal chain analysis is used at several points in the overall SIA, namely for scoping (after initial screening), the full assessment, for prevention, mitigation and enhancement measures, and for ex-post monitoring and evaluation of outcomes.

Screening work pointed to the following trade measures as being of particular relevance for this study:

> *Non-agricultural market access (NAMA) – Tariffs*: Developed countries often have zero or relatively low levels of tariffs on fish, but there are cases of escalation with some peaks (e.g. processed tuna). EU rates are on average are around 11%, but zero rates apply for ACP and LDC states. As part of the on-going WTO trade negotiations, the EU favours tariff reductions based on a Swiss formula with flexibilities for developing countries. Although coefficients have not been agreed as yet, it is likely (i.e. hoped) that this will result in maximum tariffs of about 10% for imports into developed countries and about 15% for developing countries respectively.
>
> *Non-agricultural market access (NAMA) - non-tariff measures*: Although it is likely that there will be little progress in this area as part of the NAMA negotiations, there has been substantial work undertaken by the WTO Members notifying non-tariff barriers (NTBs) they face in importing countries.
>
> *Subsidies* – The Declaration adopted at the WTO Hong Kong Ministerial Conference in December 2005 reaffirms the Doha mandate, which *inter alia* provides that in the context of Rules negotiations, participants shall also aim to clarify and improve WTO disciplines on fisheries subsidies, taking into account the importance of this sector to developing countries.

The outcome of WTO GATS (General Agreement on Trade in Services) is unlikely to affect fisheries trade, and is therefore not being analysed in detail. Nevertheless, in view of the growing importance of major retailers in the fish marketing system, there are lessons that can be learned from the SIA study of Distribution Services.

Initial screening and scoping has led to the following country case studies being undertaken: Ghana, India, Peru, Seychelles, Thailand, and Uganda. In addition, partial case studies have been prepared for China, European Union, Japan and USA.

The importance of stakeholder consultation and participation has increasingly been recognised as the SIA methodology has been developed. In particular, the importance of involving developing country stakeholders is emphasised. As a result, a number of developing country stakeholders and institutions have been involved, in particular in country level case studies.

This final analysis of the impacts resulting from potential DDA outcomes was undertaken during the third and final stage of the study (i.e. mostly in April 2006), using both case study material and secondary literature. In particular, the impacts are grouped along the lines of economic, social, environmental, and process impacts for the four country groupings identified. Prevention, mitigation, and enhancement (P, M&E) measures are analysed in relation to impact on sustainable development, cost effectiveness, and feasibility.

Key findings of the case studies

NAMA – tariff measures

For the EU in particular, and also the USA the expectation is that significant expansion in imports will be generated as a result of the Doha Round, whilst for Japan the outcome may be more muted. Many economic fundamentals, in addition to potential WTO effects, point towards expansion in imports across a wide range of fishery products for the EU. Overall, WTO impacts resulting from tariff reductions are expected to benefit a number of developing country exporters, but some will also lose as a result of preference erosion – notably ACP countries.

Developed countries – European Union

Tariff impacts will be greatest where current rates are relatively high and for product areas of major importance in EU markets (i.e. shrimp and tuna). The key economic fundamental underlying competition from developing country suppliers is their lower (often very substantially lower) labour costs. Spain (main EU tuna canner) and to a lesser extent Italy and France will loose out to low cost Asian canners for all but the highest quality speciality products. Shrimp processing increasingly moves to developing countries (an on-going process that is likely to be reinforced) with negative implications for processors in Northern Europe. The coldwater shrimp fishing industry will find already low prices dropping further. Whitefish is also likely to be affected but tariffs here are quite low and changes arise mainly because of economic fundamentals. Eastern EU processors of whitefish and small pelagics will equally be affected as processing moves on to lower cost areas in Asia. Lower tariffs in export markets (e.g. Russia) would likely result in increased EU exports of small pelagics. The main EU winners of tariff reductions will be consumers, retailers, and food services as a consequence of declining prices.

There will be social implications in areas affected by factory closures, also because a high proportion of female workers are likely to be affected. As for environmental impacts, capture primarily depends on catch control. As a consequence, increased imports do not necessarily mean less pressure on domestic fish stocks in that catch size will be determined by quotas.

Developed countries – Japan and USA

Tariff changes are unlikely to impact on levels of Japanese consumption given current duty levels, but there could be some effects in the USA. In the US market changes could strengthen existing consumption in high value fish and crustacean markets in particular and have a more marked effect in trade terms because of the likely ongoing transfer of processing capacity to low cost producing countries. Thus the growing deficits in these items could be emphasised. Impacts in Japan are likely to be more muted with regard to trade and processing patterns.

Non-ACP/LDC developing countries

The overall impact of tariff reductions on non-ACP/LDC countries is expected to be either neutral or positive in economic terms. WTO impacts as a result of tariff changes are likely to be relatively small for China given the pattern of Chinese fish production, consumption and major trading partners (e.g. importance of domestic market). As for India, the impact of more relaxed tariffs is expected to be positive in terms of consolidation of its market share and diversification into other markets. Given that Peruvian fishmeal and fish oil exports currently face low tariffs, any further liberalisation will have little or no major impact on the market for these products. Thailand is set to become a major beneficiary of trade liberalisation and the expectation is for an increase in economic activity, exports and foreign exchange generation from both tuna canning and shrimp farming, with the EU market an important factor in both cases. Thailand is also likely to benefit at the expense of ACP suppliers such as Seychelles (e.g. canned tuna).

As for social implications, positive developments are expected where employment will increase. Whilst this may trigger social changes, women are likely to benefit where fish processing industries will be further developed (e.g. Thailand).

Negative environmental impacts are expected as a result of aquaculture expansion. For example, there may be further loss of agricultural land and water pollution, and eco-systems will be affected through increased demand for feed (e.g. small pelagics used for fish meal). Thai tuna processors may be less prepared to demand that raw material comes from well managed fisheries, which could negatively impact on stock levels.

ACP/LDC countries

Preliminary case study analysis of the possible impacts of the Doha Round indicate that a substantial reduction of tariffs on imports into developed countries (i.e. by about 50%) is likely to have the greatest impact on ACP/LDC countries that largely depend on preferential market access for their exports. This is due to preference erosion resulting in the loss of their competitive advantage, which in turn is expected to lead to lower profits as a consequence of declining prices and lower volumes traded. Increased competition will force fish processing plants to attempt to reduce costs through measures such as paying lower prices for raw material or laying off workers. There is a danger that some processing industries (e.g. tuna canneries) will collapse, threatening the viability of transhipment centres such as Mahe in the Seychelles. In addition, government revenues (e.g. tax income) will be reduced, and a drop in foreign exchange earnings may lead to greater exchange rate instability.

Unemployment can be expected to increase where workers will be laid off or processing plants will close, and women are more likely to be affected in plants employing a high proportion of female workers. The extent of such an impact will depend on locality and fish species, in that some will be less affected (e.g. Nile perch industry) and others more (e.g. tuna processing). Higher levels of unemployment are expected to lead to increased poverty amongst the workforce of affected industries, including input suppliers, and knock-on effects are likely to impact on health and education. The latter may be aggravated through reduced government spending as a consequence of lower revenues.

As for environmental impacts, a declining fisheries and processing sector could well lead to a reduced national management and administration capacity, resulting in a reduced commitment to monitoring, control and surveillance (MCS) activities by governments in affected countries. Although one might expect that a declining processing sector may have a positive effect on domestic fish stocks, there could be little impact if catches simply get diverted to countries with a more competitive processing industry.

As for process impacts, there will be an issue over the need for increased regulation to meet environmental demands and to ensure that the export industry meets increasingly stringent hygiene and other standards.

Subsidies

The following section is based on the assumption that a negotiated compromise – most probably close to the EU middle-ground position - will result from the Doha Round negotiations on fisheries subsidies. Although it has been expected that developing countries will benefit from Special and Differential Treatment, this is uncertain especially following recent proposals by Argentina and Brazil.

<u>Developed countries – European Union</u>

As part of the WTO negotiations, the EU position lies between the "top-down approach" of the Friends of Fish group (e.g. New Zealand, Chile, Peru, USA) and the "bottom-up approach" by countries such as Japan, Korea, and Taiwan. The EU approach is based on boxes (i.e. red and green) whereby subsidies contributing to overcapacity are prohibited (e.g. subsidies for vessel construction or renovation). On the other hand, capacity decreasing subsidies and support for the development of alternative income sources in affected fishing communities are acceptable. Significantly, the EU is also advocating more transparency and effective enforcement mechanisms. Some of the subsidy reducing measures have already been put in place as a result of the EU's reformed Common Fisheries Policy (CFP). The contributions of vessel owners as part of Fisheries Partnership Agreements (FPAs) are slowly being increased.

A positive environmental impact as a result of subsidy reductions is likely to happen in the medium to long-term when the current generation of fishing fleet will reach its useful life.

<u>Developed countries - Japan and USA</u>

Subsidies have been used extensively in the past in the fisheries sectors of both Japan and the USA. In Japan subsidies have been particularly prevalent in support of the fishing fleet. The US has also engaged in subsidising various components of the fishery sector including research and development and the development and expansion of the fishing fleet. More recently the US approach has been to seek to restrict fleet capacity through buy-back programmes.

Japan and the US are at opposite ends of the current debates on subsidy issues. The US view (along with other members of the "Friends of Fish" group), is that the WTO SCM measures do not go far enough in terms of environmental and developmental concerns. Japan in contrast argues that subsidies are an issue only where they lead to distortions in trade.

To the extent that a reduction in subsidies leads to an increase in fishing costs, then this might be expected to diminish production, consumption and/or trade, with an offsetting beneficial impact on fish stocks.

Non-ACP/LDC developing countries

Using the country case studies as examples, this section summarises the impact of fisheries subsidy reductions in the context of a range of countries, which show considerable variations as far as the extent of subsidy use is concerned.

With regard to subsidies it is difficult to predict future Chinese action, but state involvement in economic planning and the direction of economic activity remains strong in a number of key fishery areas. Part of the current pattern of subsidies is switching towards capacity reducing activity (i.e. reduction in the domestic fleet size), but in other areas is clearly supporting expansion – notably for a range of aquaculture support measures. The impact of more recent action on subsidies, notably the attempt to reduce capture capacity, especially when combined with attempts to promote more sustainable management regimes, may imply reduced catch and hence some combination of reduced consumption and/or trade, especially for higher value demersal species that are most under threat from over-fishing.

As part of the liberalisation of India's economy, a number of measures have been taken that reduced subsidies to the fisheries sector in one way or another, namely, reduction or removal of subsidies on inputs (e.g. fuel), fishers sharing part or whole of the cost of public investments, reduction or removal of tax preferences, reduction in subsidised lending and credit provision arrangements, and reduction in provision of public service under the Structural Adjustment Programmes. Although it is argued that a complete withdrawal of direct fisheries subsidies is unlikely to affect the conditions in the supply chain, a further reduction of indirect subsidies (e.g. fuel price increases) might affect the viability of fishing operations. This would have negative social consequences, but a positive impact on the environment.

The Peruvian government only provides some small subsidies by way of exemption or reduction of fiscal obligations in order to stimulate inland aquaculture. Free use by the artisanal fishermen of government terminals to land fish might also be considered an unquantifiable subsidy. However, services provided by the terminal, such as the wholesale market and sale of ice are paid for by the artisanal fishermen. In view of this, there would not appear to be any serious impact on the Peruvian fishing sector if subsidy removals were to be introduced.

The overall impact of subsidies on the Thai seafood sector is believed to be currently limited, though research has clearly generated benefits in the past. However, it is possible there could be a converse indirect benefit as, were there to be a general global abandonment of direct subsidies throughout the sector, this could enhance Thailand's competitive position.

ACP/LDC Countries

Subsidies to the fisheries sectors of ACP/LDC countries show substantial variations and can include items such as fuel at lower or no tax, credit provision on favourable terms, capacity building such as skill training, tax exemptions on inputs destined for fish processing plants, research and management, and license fees paid to governments as part of fisheries access agreements. In general, the impact of subsidies is dependent on the type of fisheries management in place. The more effective a management regime, the lower the impacts that can be expected as a result of subsidies.

Ghana's government, for example, provides some subsidies largely to support artisanal fishermen (e.g. fuel tax exemption) and women processors (e.g. skill training and soft loans). It is expected that a removal of these subsidies would lead to a significant number of fisherfolk going out of business, with negative knock-on effects on poverty, primary health care and education, but potentially positive implications for the environment as fishing effort will be reduced. Also, it is argued that a removal of subsidies to foreign fleets to fish outside their territorial waters will help replenish the stocks of Ghana's EEZ.

As for Uganda, it is estimated that subsidies to support small-scale fishers have a negligible distorting impact on the international fish trade although their removal could cause increased hardship. Removal of the subsidies supporting processing operations would reduce their ability to compete.

As for Seychelles, it is suggested that abandonment of the FPA agreement could significantly reduce government receipts, potentially affecting resource management as FPA compensation is partly ring-fenced for fisheries management, especially MCS. Abandoning direct subsidies would have limited impact as they appear to have failed to achieve their objectives of expanding the artisanal fishery.

Other trade measures

SPS related seafood export bans imposed during the 1990s by the EU in Uganda, and EU, Japan, and US in India had significant short- and long-term impacts. Uganda's Nile perch export bans represented major shocks for the fishery sector, leading to short-term loss of exchange earnings, bankruptcies and unemployment. In the medium, to long-term, however, the sector has recovered well, with a smaller but better equipped processing sector, improved marketing strategy, and strengthened institutions. As for India, among the different trade measures, the SPS Measures have been by far the most significant in terms of their impact upon the seafood export sector in the country and led to a virtual reorganisation of its structure and operations. The gains were in terms of improving the local standards to international level, whilst the negative consequences have been the high cost of upgrading the industry, loss of livelihoods and reduced profitability. The TBT Measures, which affected India in the form of a ban on shrimp exports to the US for not using appropriate measures to reduce turtle mortality caused by trawlers, had much less impact upon the sector.

India is one of the six countries affected by anti-dumping measures (ADM) imposed by the US on shrimp imports. As a result of shifting markets from the US to the EU, the impacts of the antidumping tax are barely visible. The loss of US markets may have kept the shrimp prices more or less stable, even showing a marginal decline in terms of unit value realisation but this might also reflect a global trend. ADM measures also remain critical for other countries as to the extent to which the US chooses to pursue them in future and the extent to which they will be challenged through the WTO system.

No in-depth analysis of Rules of Origin (RoO), Regional Fisheries Management Organisations (RFMOs), fisheries related services, and anti-dumping measures has been undertaken as part of the country case studies given that the potential outcome of current WTO negotiations appears to have little impact on these issues.

Prevention, mitigation, and enhancement (P, M, and E) measures

To prevent, mitigate and/or enhance the identified impacts, the following recommendations are being proposed:

Economic and trade related measures

- Gradual (rather than precipitate) reduction of tariffs to allow fisheries and processing industries to adapt to changes;
- In relation to non-tariff measures, capacity building of standard boards;
- Investments for the provision of infrastructure, support systems and modern efficient technology to make developing country suppliers more competitive;
- Marketing initiatives such as development of new domestic, regional or overseas markets, and targeting of ‘higher-end’ quality markets. Some trade observers consider South - South trade a potential option to mitigate the impacts of the Doha Round, whilst acknowledging that there are also capacity related constraints to expand trade flows at this level;
- Development of aquaculture into a medium to large-scale commercial industry; (e.g. Africa);
- Development assistance or other support from the international community to help cover losses from preference erosion.

Social measures

- Design and implementation of alternative livelihoods and employment programmes;
- Retraining and skill development measures in particular for women;
- Existing social subsidies should be continued and strengthened to help the poor in the fisheries sector using more holistic indicators of poverty (e.g. India);
- Support for the shrimp sector around the Gulf of Mexico and specific programmes geared to native communities in North America;
- Special and Differential Treatment of small-scale and artisanal fisheries.

Environmental measures

- Application of an ecosystem approach in response to environmental concerns related to aquaculture production as well as capture fisheries;
- Development of fishmeal substitutes;
- Private sector initiatives and public, private partnerships;
- Eco-labelling should be considered as a tool to achieve both fisheries management and marketing objectives;
- Stopping of illegal, unreported, and unregulated (IUU) fishing;
- Reduction or redeployment of fishing capacity.

Process related measures

- Capacity building and institutional support including measures such as:
    - Support for the Regional Maritime Academy in Ghana;
    - Institutional capacity to understand the possible implications of the DDA and to develop the ability of coping with possible changes (e.g. Uganda);
    - Monitoring, control and surveillance (MCS) capacity, also if Fisheries Partnership Agreements were to be abandoned or downscaled (e.g. Seychelles).
    - Resource assessment studies to determine the potential availability of marine (inshore and offshore) and brackish-water resources and their current levels of exploitation (e.g. India). Also, more pro-poor orientation in policymaking and implementation has been suggested in India.
- Government regulation (e.g. in the context of the environment and the rapidly growing seafood sector in countries such as Thailand);
- Engagement with institutions and in international debates affecting the fisheries sector (e.g. China).

1. Introduction

The Natural Resources Institute (NRI) of the University of Greenwich has been sub-contracted by the Impact Assessment Research Centre (IARC) of the University of Manchester to undertake a Sustainability Impact Assessment (SIA) of WTO Negotiations – Fisheries Sector Study. The study is funded by the European Commission in Brussels (DG Trade).

A broad methodology, which is based on causal chain analysis (CCA), has been prepared by IARC and applied to similar studies covering the agricultural and forestry sectors. These documents are available at www.sia-trade.org and have been consulted for the development of the methodology for the SIA of fisheries trade. An overview of the methodology used in this study is provided in Section 2 followed by an outline of some of the key features of international fisheries production, trade and consumption in Section 3.

The overall objective of the study is to assess the potential economic, social and environmental impacts of trade measures arising from the Doha Development Agenda (DDA) negotiations that have an impact on fisheries production and trade. These trade measures include:

- Market access, as part of the negotiations on non-agricultural market access (NAMA):
    - Tariff measures, in particular tariff reductions as a result of the current WTO negotiations and potential preference erosion for ACP and LDC countries);
    - Non-tariff measures. Although it is likely that there will be little progress in this area as part of the WTO negotiations, there has been substantial work undertaken by the WTO Members notifying non-tariff barriers (NTB's) they face in importing countries;
- Subsidies which are being discussed by the WTO Negotiating Group on Rules;
- Other issues, such as services incidental to the fishery sector.

1.1 Work programme and report structure

The SIA fisheries study was undertaken between December 2005 and May 2006. Three reports were prepared and presented to the European Commission and Civil Society Organisations for comments, namely an Inception Report (discussed on 15 February 2006), the Mid- term report (discussed on 26 April 2006) and this Final Report (to be discussed on 16 June 2006).

The Final Report is made up of a Main Report containing 7 Sections, an Executive Summary and detailed list of references and contacts. In the Main Report, following the introduction (Section 1), the methodology used in the SIA fisheries study is outlined (Section 2); an overview of production, consumption and trade in fish and fish products is provided in Section 3. Based mainly on the 10 case studies undertaken, an assessment of the key issues and potential impact of various trade measures arising from the Doha Development Agenda (DDA) are analysed in the next three sections; namely tariff reductions (Section 4), fisheries subsidies (Section 5), and other trade issues including non-tariff barriers, rules of origin, the role of regional fisheries management organizations, and anti-dumping measures (Section 6). Based on the outcomes of the previous analysis various prevention, mitigation, and enhancement measures are proposed in Section 7 to offset the negative impacts and improve the positive impacts.

The 10 case studies are available in separate files. These can be divided into 4 groups namely: ACP/LDC countries (Ghana, Seychelles and Uganda), non-ACP/LDC developing countries (India, Peru and Thailand and a partial case study of China); developed countries with partial studies of the European Union, Japan and the USA.

Project Reports including the case studies as well as information about the project are available from the project website: http://www.sia-trade.org

2. Methodology for SIA of Fisheries Trade

2.1 Overview

The methodology for analysing impacts of trade negotiations has been developed for the EU through inputs from IDPM, Manchester University (see for example Kirkpatrick and Lee 1999 and Kirkpatrick and Lee 2002). Overall the methodology identifies three key areas of impact – social, economic and environmental – and the aim in this analysis is to allocate broadly similar importance to each of these.

The key components of the SIA methodology are:

- Scenarios for negotiation outcomes – initially assessed by screening and scoping;
- Development and use of indicators of impact, especially second tier indicators that are specific to fisheries;
- Causal Chain Analysis (CCA) using pre and post (equilibrium) adjustment scenarios;
- Identification and implementation of case studies for countries representative of key groupings, especially for sub-sets of developing countries and LDCs;
- Development and use of prevention, mitigating and enhancement measures to interact with initial CCA outcomes.

Given the current economic and policy context the analysis required an initial screening process – specifically in order to identify areas where potential changes are occurring with respect to trade policy/negotiations. Screening can cover the full range of trade measures, but the starting point for identification of issues is the list of negotiation areas developed for the Doha Round. Of these, subsidies and market access for non-agricultural products are especially important for fisheries, and also other areas such as trade and the environment. Components in trade negotiations include those up to December 2005, i.e. incorporating the initial outcomes of the Hong Kong WTO Ministerial Conference.

Screening at the inception stage was based upon analysis and preliminary CCA using the following criteria:

- The likely scale of impact of the trade measure on particular production systems;
- The location of impact, especially with respect to developing countries and LDCs;
- The extent to which specific groups will be affected, especially in the artisanal fisheries sector and amongst the poor in fishing communities more generally;
- The environmental impact of changes especially with respect to more intensive systems, e.g. terms of intensity of fishing effort (for capture fisheries) and habitat loss/ environmental pollution with regard to aquaculture;

- The availability of data and reliability of qualitative information.

Scoping was then undertaken in order to identify the relative importance of measures and hence their place in subsequent analysis. The underlying assumption is that outcomes will represent the effects of partial liberalisation, based upon a realistic interpretation of likely implementation of negotiation outcomes.

Screening and scoping analysis, as well as covering trade negotiation outcomes, also provided a preliminary assessment of the types of preventative, mitigating and enhancement (P, M and E) measures that need to be included in the analysis (see below).

The types of factor that are of importance in screening and scoping for fisheries are briefly noted below, summarising at the same time key aspects of trade measures outlined in the previous section. These trade measures include:

- Market access (i.e. tariff and non-tariff measures) as part of the negotiations on non-agricultural market access (NAMA);
- Subsidies to the fisheries sector in different forms, which are being discussed by the WTO Negotiating Group on Rules; and
- Other trade issues, e.g. eco-labelling and services incidental to the fishery sector.

2.1.1 Sustainability indicators and significance criteria

The UNCED meetings of 1992 provide the key definition of sustainability issues in a range of sectors including fisheries. For the marine (and coastal) environment the international basis for protection and sustainable development is provided via the United Nations Convention on the Law of the Sea. UNCED stresses the importance of new approaches to the management and development of the marine environment, and similarly that parallel needs exist for fisheries as part of integrated approaches to the management of freshwater resources. For marine resources UNCED identified a number of key areas of concern and required action with regard to sustainability:

- Integrated management and sustainable development of coastal areas, including exclusive economic zones;
- Marine environmental protection;
- Sustainable use and conservation of marine living resources of the high seas;
- Sustainable use and conservation of marine living resources under national jurisdiction;
- Addressing critical uncertainties for the management of the marine environment and climate change;
- Strengthening international, including regional, cooperation and coordination;
- Sustainable development of small islands.

In addition, for freshwater resources UNCED stresses the importance of conservation, coupled to recognition that both freshwater capture and aquaculture fisheries are potentially damaging to aquatic ecosystems.

For analytical purposes the study uses sustainability definitions as developed in the common methodology for other SIA studies (Kirkpatrick and Lee 2002). This definition comprises three categories of core indicators covering the economic, social and environmental dimensions, plus a fourth category of process indicators which assist in analysis of sustainability and sustainable development issues. Each of these categories of impact can be assessed using core indicators (Kirkpatrick and Lee 2002), as shown in Table 1. For each of the core indicators in turn there are more detailed second tier indicators which are more specific to fisheries, and which attempt to incorporate key aspects of the UNCED agenda. Table 1 includes draft second tier indicators, the criteria for selection of which are:

- Second tier indicators need to cover each of the nine core and two process indicators;
- As far as possible there should be (reliable) data available to measure each indicator;
- Where quantitative information is not available it must be possible to at least provide indicators of the nature and direction of change, and significance;
- Indicators should be such that changes in indicators can be linked to changes in trade measures;
- Indicators should be chosen that illuminate specific fishery impacts that are of value to trade negotiators.

The second tier indicators provide the means for assessing the changes in core indicators that can arise from liberalisation. This will require the development of assessments of the likelihood, scale and reversibility of impacts. Since data are unavailable with respect to country groups, case study countries are used to analyse the direction and scale of effects.

Indicative scoring systems for assessing the significance of individual indicators are provided in the basic methodology (Kirkpatrick and Lee 2002). These are used and developed to meet the needs of specific parts of the analysis, e.g. to include aspects of timing, probability of outcome, reversibility etc. Scoring can also be applied to impacts at differing levels of aggregation, e.g. in terms of individual countries or country groups, differing components within a given trade measure, and for differing key product groups (e.g. tuna, shrimp) that are of key importance to developing and LDCs.

In the case of many outcomes there are P, M and E measures that can be applied which will interact with the original outcome to produce a different final result. The aim here has again been to use indicators defined above in order to assess impact, especially process indicators.

Table 1: Sustainability indicators for fisheries SIA

Sustainability dimension	Core indicators	Second tier indicators
Economic	Real income	Levels of production, trade, income levels of different stakeholder groups, expenditure, consumption - payment in kind*, Govt. revenues (licence fees, taxes, etc);
	Employment	Levels of employment in fishing and post-harvest fisheries industries, semi-industrial and artisanal employment*;
	Fixed capital formation	Size and type of fleet, Gear, Landing and processing infrastructure; etc
Social	Poverty	Indebtedness*, nutrition data, female headed households*, coastal livelihoods and development, coastal-urban migration;
	Health and education	Primary health care, primary education levels, especially in fishing communities;
	Equity	Income distribution, Asset ownership* (boats and gear, processing, aquaculture); Gender distribution – income and assets*
Environmental	Natural resource stocks	Change in marine and freshwater stocks, change in catch/composition (e.g. total allowable catch);
	Environmental quality	Changing marine and freshwater /aquaculture pollution; changes in eco-systems;
	Biodiversity	Change in endangered species, change in protected areas, change in deepwater fishery;
Process	Consistency	Domestic policies, EEZ monitoring, control over foreign fleets, international commitments – stock conservation, aquaculture policy;
	Institutional capacity	Government capacity and commitment; government use of revenues from fisheries; monitoring, control and surveillance capacity; aquaculture management capacity.

* indicators where data are more likely to contain qualitative elements.

2.1.2 Causal chain analysis (CCA)

The fundamental focus of causal chain analysis within the study is to analyse effects arising from changes in existing trade agreements (or from new agreements) with respect to their impact (i.e. in terms of economic, social, environmental and process indicators noted above). Given the wide range of possible changes and effects the key issue is to identify and assess significant outcomes of changes in trade policy. Thus there is a need for criteria to assess significance (which need to be consistent with criteria used for significance of indicators used above).

Causal chain analysis is used at several points in the overall SIA:

- For scoping (after initial screening) e.g. to decide which categories of fish product need to be covered;
- For the full assessment i.e. covering in depth analysis of liberalisation factors and their impacts;
- For prevention, mitigation and enhancement measures i.e. assessing the interaction between P, M and E and earlier outcomes of the full assessment;
- For ex-post monitoring and evaluation of outcomes.

For the full assessment the analysis is based upon pre and post adjustment phases and work on the assumption that the outcomes stemming from trade negotiations are the only change factor. The assumption is that changes are fully worked through to a new equilibrium position (i.e. a long run adjustment position). The post adjustment position is then refined in the light of possible P, M and E adjustments.

A variety of other assessment methods can be used in combination with CCA – i.e. analytical approaches, modelling, statistical estimation, case studies, expert opinion and consultation. Analytical approaches can be useful in defining key relationships but quantification may require modelling and/or a variety of statistical approaches. However all these approaches are less able to handle qualitative information which may be particularly important in assessing some social and environmental impacts. Qualitative data are often especially important with respect to impacts on poor people in developing countries, especially fishing communities where formal data are often non-existent, weak or unreliable. The analysis overall therefore incorporates a variety of measures to ensure that impacts at this level are effectively identified and analysed. Case studies, especially those that include a degree of quantification and cause/effect analysis help to address such aspects.

In developing the analysis the emphasis is upon a pragmatic approach that maximises the use of existing data, studies and expert opinion, especially in the early stages. The aim is thus, for example, to draw upon existing modelling, and to update and develop existing data sources as far as possible, rather than initiating substantial new work in these areas. Because of the importance of developing countries and LDCs the relative poverty that is often present in the artisanal fisheries sub- sectors of such countries, analytical approaches will include the sustainable rural livelihoods approach developed with the encouragement of DFID. Part of the value of the approach is that it makes explicit the interactions between differing forms of capital that are not simply economic in nature but also include social and natural resource (and hence environmental) components.

The impact of liberalisation in the short term will be in price terms, e.g. those associated with changes in tariffs or changes in trade regulations etc. These impacts may be in terms of domestic prices (for countries making the change) or effects on international prices. The longer terms impacts – the focus of causal change analysis – will be on a wider array of economic, social and environmental components.

Economic impacts include price effects which result in turn in changes to production and associated trade patterns. For developing countries and LDCs these impacts will be complicated by consumption factors and the differential capacity of groups of fishers/processors to respond to price signals. In particular the capacity to exploit new or wider opportunities is most likely to be met by larger fishers (typically boat/fleet owners), and processors, or by those with the resources to invest in large scale aquaculture. Consumption effects may be complicated by payments in kind (e.g. to crew and small scale processors), and competition between food and feed use (especially for low grade pelagics).

Social impacts in developing countries and LDCs hinge in particular on the scale of the artisanal sector which often represents some of the poorest groups. Within this sector socio-economic relationships such as indebtedness, skewed ownership of assets, social obligations and differing gender roles means that impacts of changes from trade negotiations may be complex. For example the implementation of SPS is likely to marginalise small scale processors who are often women, whilst there may be some offsetting gains in formal sector employment – but not necessarily exclusively for women (e.g. in larger modern processing facilities). The balance of overall net benefits and their distribution may not be easy to pre-determine. For some developing countries it will also be important to assess specific factors relating to the semi industrial fisheries sub-sector (e.g. deepwater fishing activity operated by domestic vessels).

Environmental impacts from changing trade relationships can be positive e.g. eco labelling may encourage more sustainable fishing practice. However many economic price incentives are likely to lead to growth of more intensive systems in both capture fisheries and aquaculture, which in turn can often have negative outcomes. For example commercial pressure to develop shrimp and prawn culture in coastal areas (often former mangrove swamps), may lead to multiple and often negative outcomes (e.g. through loss of habitat for breeding, sheltered areas for juveniles etc). Part of such environmental impacts will be cross sectoral in nature e.g. to the extent that liberalisation encourages more intensive agricultural practice (e.g. increased use of agro-chemicals), a potential knock on effect is greater pollution in both freshwater and coastal waters.

Figure 1 provides an overview of key steps in the fisheries SIA which were used in the country case studies.

Figure 1: Main Steps in Sustainability Impact Assessment (SIA) of Fisheries Trade

1. Baseline (e.g. fisheries production / trade / consumption etc)

↓

2. Changes in trade measures as a result of WTO negotiations (assumed)
- Tariff measures, reductions
- Non-tariff measures, constant
- Subsidies, reductions

↓

3. Initial outcomes (predicted)
- Changes in relative prices and trade flows
- Initial economic, social, environmental, and process impacts

↓

4. Longer-term effects (predicted)
- Economic impacts
- Social impacts
- Environmental impacts
- Process impacts

↓

5. Prevention, Mitigation and Enhancement measures (assumed)
- Economic impacts
- Social impacts
- Environmental impacts
- Process impacts

↓

6. Final outcome

2.1.3 Prevention, mitigation and enhancement (P, M and E) measures

Prevention, mitigation and enhancement (P, M and E) measures (which may also be termed "flanking" measures) represent actions that can mitigate negative impacts or improve positive impacts of trade liberalisation. They have assumed growing importance in SIAs as the methodology has been developed. They are also emphasised strongly in the ToR for the fisheries SIA. Flanking measures may be significant across the range of trade issues, but may be especially important where current trade components and requirements are unlikely to change. This relates most clearly to SPS and HACCP, where requirements are unlikely to be reversed, and hence P, M and E adjustments will be especially important, in particular for LDCs and for poorer groups (of producers and processors) in developing countries more generally.

The aim is to link P, M and E measures to scoped trade issues i.e. to identify the need and scope for e.g. mitigation measures for specific important components of trade liberalisation. There are three criteria for assessing the value of individual P, M and E measures:

- Impact on sustainable development (using primary and secondary indicators identified in Table 1);
- Cost effectiveness (i.e. size and distribution of costs);
- Feasibility (in terms of political, institutional and financial processes required).

The "best" P, M and E measures can then be integrated with the initial trade assessment to produce modified scenarios, both in terms of individual P, M and E measures and for the package as a whole. The types of measure envisaged include:

- Trade related measures that can be directly built into agreements or developed in parallel, e.g. supporting developing country and LDC production and export diversification and regional trade agreements;
- Negotiation and clarification of the interaction of trade and other agreements e.g. the effects of environmental measures, especially with respect to developing country and LDC market access;
- Technical assistance especially for developing countries, to improve their capacity to participate in and benefit from rules based trading systems;
- Trade measures taken in the framework of International and Regional Fisheries Management and Conservation Arrangements;
- Trade restrictions taken on the basis of producing country legality;
- Full compliance with international commitments on fisheries – and integration of such commitments into fisheries agreements (i.e. on the protection of marine habitats in deep waters in the high seas);
- The development of measures at regional level to ensure the sustainable exploitation of stocks and mitigate impacts on other components of marine ecosystems (e.g. non-commercial species) and the role of Regional Fisheries Organisations in this respect. The potential role of other relevant labelling initiatives such as a labelling for fishery and aquaculture products which are produced with a limited impact on fish stock (eco-labelling);

- National level measures e.g. removing supply side constraints and market strengthening. Improving regulation and financial systems, improving institutional capacity especially that interfacing with fishers/ fishing communities.

The last measure may be of particular interest to developing countries and LDCs as it is the one they have the most immediate control over, and one which may also produce positive outcomes in the relatively short term.

2.2 Country groupings and case studies

The EC SIA methodology has identified four country groups to facilitate analysis:

- The European Union (EU)
- Non- EU Developed Countries
- Developing Countries
- Least Developed Countries (LDCs)

Assessment of the economic and policy aspects relating to fisheries suggest that developed countries are often major fish catch/processing countries that are becoming increasingly dependent upon developing countries as a whole, either for imports (including imports for processing) or as a means of access for their fleets for fishing (e.g. access agreements). The position is made more complex by developed country subsidies (in contrast to the generally limited array of subsidies applied by developing countries and LDCs), that may exacerbate problems with sustainable fisheries.

Within the developing country group it is also useful to distinguish between importers and exporters that will be affected differently by changes in trade regimes. In addition, within the developing country group it is important to distinguish Least Developed Countries where poverty issues may mean that trade impacts are particularly important in both economic and social terms. The Doha Round places a strong emphasis on the importance of Developing Countries in negotiations/outcomes and also of LDCs within this group.

In view of this, the following four main country groupings have been chosen:

- Developed Countries that are major producers[1] and (net) importers
- Developing Countries that are producers and major importers
- Developing Countries that are major producers and exporters *
- Least Developed Countries that are major producers and exporters*

* distinguishing sub-groups with differing trade preferential status, e.g. those with or without ACP status

[1] 'Production' in the fisheries context includes aquaculture, as well as marine and inland capture fisheries.

Table 2 summarises the country case studies and also indicates which other countries have been covered in some detail.

Table 2: Overview of country case studies

Country	Key Characteristics
Countries for which full case studies have been undertaken	
Ghana	ACP country which has significant fish catch (both marine and to a lesser extent freshwater) but is also a large importer. Overall duty structures have varied and a recent 5% rate has been placed on imported fish.
India	Large capture fishery and aquaculture production. It is also a significant exporter. Although tariff levels have been reduced recently (from an average of 60% to 35%) these remain high.
Peru	Has the second largest (marine) capture fishery after China, and exports the vast majority of its catch (largely going to the fishmeal sector). Import duties on fish products average around 12%.
Seychelles	Small Island Developing State and ACP country, exhibiting export dependency upon fish (especially canned tuna), plus heavy dependency upon imports, including food items. Fisheries Partnership Agreement (FPA) in place with the European Union.
Thailand	Large capture fisheries and aquaculture production. Second largest exporter of fishery products, with substantial domestic fish processing capacity. Importer of substantial volumes for industrial use (fishmeal-aquaculture). Has reduced tariff levels to some extent (down from 60% to 5-30%).
Uganda	LDC and ACP country which has a significant freshwater fishery with exports especially to the European Union. It retains common charges on all import categories amounting to 15%. by value
Countries which have been dealt with in more detail but not as full case studies	
China	Main global fisheries producer and exporter. Major aquaculture industry and sizeable importer.
European Union	Significant domestic catch and also exports, but large net import balance.
Japan	Both major producer and importer
United States	Both major producer and importer

Note: A case study was originally proposed for Spain; however it was subsequently agreed with the European Commission to undertake a wider study covering the European Union.

In addition to the case studies the countries selected for partial investigation included mainly non-developing country key participants in the global fishery sector, namely the EU, USA and Japan. China has also been included as the largest producer and consuming nation and currently also the largest global exporter and a sizeable importer. These studies necessarily can only provide indicative possible outcomes from WTO changes to complement more in-depth findings from the full case studies.

2.3 Consultation and stakeholder participation

The importance of stakeholder consultation and participation has increasingly been recognised as the SIA methodology has been developed. In particular, the importance of involving developing country stakeholders is being emphasised.

The case studies for Ghana, India, Peru, and Uganda are being undertaken by stakeholders/consultants that are based in country. Due to difficulties in identifying a suitable partner at short notice, the Seychelles case study is being undertaken by a UK based consultant who has extensive knowledge of the country's fishery.

In Thailand, a local collaborator was identified. However the principal author was also working on another project which has subsequently been affected by terrorist activity leading to loss of many project documents. Therefore, the company had to withdraw from the study at very short notice and a suitable replacement partner was identified.

The terms of reference for the case study collaborators note that "It is therefore particularly important that adequate consultation with in-country stakeholders takes place. Stakeholders should include policy decision makers, private sector individuals and associations, NGOs, and trade unions (where these exist). Consultation can include visits to these organisations, phone calls, e-mail correspondence, etc. (although it is recognised that there is not time for detailed fieldwork). Details should be given in the case study report". The following provides a list of some of the stakeholders who have been consulted during the course of the SIA of fisheries trade:

- European Commission, i.e. DG Trade, DG Fish, DG Dev and DG Env;
- Civil Society Organisations in both developed and developing countries;
- Private sector associations (e.g. fish processors, vessel owners);
- DFID and DEFRA Advisers;
- Commonwealth Secretariat;
- WorldFish Centre; Regional Africa & Middle East Office
- Fisheries Departments in both developing and developed countries;
- Organisation of Economic Cooperation and Development;
- International Centre for Trade and Sustainable Development;
- Marine Stewardship Council;
- United Nations Food and Agriculture Organization.

3. Production, Consumption and Trade of Fish and Fisheries Products

3.1 Production

In 2002, an estimated 38 million people earned their income through fishery and aquaculture production related activities (FAO, 2004). The vast majority of these people live in developing countries. The total number of fishers and fish farmers has increased at an average rate of 2.6% per annum since 1990.

In 2002, world fishery production (excluding aquatic plants) was of the order of 133 million tonnes, of which 41.9 million tonnes came from aquaculture sources (Vannuccini, 2004). About 38% (live weight equivalent) of the total production was internationally traded. Overall, the majority of fisheries production takes place in developing countries, i.e. 76.6% of 132.5 million tonnes in 2003 (FAO Statistics).

According to Delgado et al (2003), global capture production of food fish has rapidly increased from 44.5 million tonnes in 1973 to 64.5 million tonnes in 1997 (Delgado, et al). The vast majority of this production (over 90 percent in 1997) has come from marine fisheries. During this period, the production of developed countries as a whole declined by about 3.6 million tonnes, whilst production in the developing world increased at an average annual rate of 3.4 percent. This led to an overall shift in production toward developing countries and away from developed countries. Part of this shift is the consequence of the establishment of 200-mile Exclusive Economic Zones (EEZs), which allow coastal nations to claim exclusive fishing rights. At the same time, there are cases were developed-country companies own the boats that fly the flags of developing countries. However, some developing countries are also eager to develop their fishing industry, including through ownership (total of partial) of domestically flagged vessels.

China's production of capture and aquaculture fisheries has increased rapidly over the last two decades making it the single largest producer in both categories. However, the reliability of China's production data has been called into question suggesting that production has been systematically overestimated at least since the early 1990s. Lu (1998, quoted in Delgado et al, 2003) suggests that institutional incentives that reward or punish local officials based on reported productivity may be largely responsible for the increasing distortion.

At the same time, **capture fisheries is an industry in crisis** as the natural resource limits of the oceans, coastal regions, and many inland water bodies have been reached (World Bank, 2004). According to FAO estimates, approximately half of the stocks (52%) are fully exploited and therefore producing catches close to their maximum sustainable limits, whilst approximately one-quarter are overexploited, depleted or recovering from depletion (16%, 7% and 1% respectively) and need rebuilding (FAO, The State of World

Fisheries and Aquaculture, 2004). This alarming situation is perceived by many as jeopardising the livelihoods of fisherfolk in both developing and developed countries. Despite some international efforts to reverse this situation, trends have not significantly changed during the last few years.

Despite the stagnation in capture fisheries production, overall food fish production grew at an average annual rate of 3.1% between 1985 and 1997. This rapid growth is almost entirely the result of the global boom in aquaculture production, which grew at 11.2% per year over the same period (Delgado, 2003).

Whilst capture fisheries production has been stagnating or declining in many parts of the world since around 1990, aquaculture production has increased significantly during the last two decades, especially in Asia. Projections until 2020 by IFPRI and the Worldfish Centre paint a similar picture for the future (Table 3). In Sub-Saharan Africa the situation is different in that policy makers are willing to promote aquaculture for domestic consumption and export, however it has yet to contribute significantly to fish output (NRI and Foodnet, 2002). In Latin America, Chile has a large aquaculture fishery production in marine fishing areas, whilst Brazil is the largest aquaculture producer in inland fishing areas.

Table 3: Total production of food fish: 1997 and 2020

	Actual 1997		Projected 2020	
	Million tonnes	**Share from aquaculture**	**Million tonnes**	**Share from aquaculture**
China	33.3	58%	53.1	66%
Southeast Asia	12.6	18%	17.5	29%
India	4.8	40%	8.0	55%
Other South Asia	2.1	23%	3.0	39%
Latin America	6.4	10%	8.8	16%
West Asia and North Africa	2.2	9%	2.8	16%
Sub-Saharan Africa	3.7	1%	6.0	2%
United States	4.4	10%	4.9	16%
Japan	5.2	15%	5.2	20%
European Union 15	5.9	21%	6.7	29%
Eastern Europe and former Soviet Union	4.9	4%	5.0	4%
Other developed countries	4.8	12%	5.8	20%
Developing world	68.0	37%	102.5	47%
Developing world excluding China	34.6	17%	49.4	27%
Developed world	25.2	13%	27.6	19%
World	93.2	31%	130.1	41%

Source: Delgado et al (2003);
Note: Actual data were calculated by authors from FAO 2002a; projections for 2020 are from the baseline scenario of IFPRI's IMPACT model (July 2002). Actual data are three-year averages centred on 1997. Projected growth rates are exponential, compounded annually using three-year averages as endpoints. Projections are based on the most likely (baseline) scenario.

It is estimated that in 2003, 21.3% (i.e. slightly more than 28 million tonnes) of world fishery production were used for reduction to meal and other non-food purposes, virtually all from marine capture fisheries. Fishmeal and fish oil are primarily used for feeding terrestrial livestock and farmed fish. The consumption of both of these protein sources is likely to grow quickest in countries with rapid population growth, rapid income growth, and urbanization. Given that aquaculture is likely to grow rapidly over the next 20 years, there are growing concerns that increasing demand for fishmeal and fish oil could place heavier fishing pressure on threatened stocks of reduction fish

3.2 Consumption

The bulk of fisheries production is destined for human consumption (i.e. 79% in 2003) as highlighted in Table 4. Most fish is marketed in fresh form, followed by freezing, curing and canning.

Table 4: Disposition of world fishery production ('000 tonnes)

	2001	2002	2003
Total world fishery production	130,627	132,993	132,524
For human consumption	99,521	100,639	104,247
Marketing fresh	52,300	52,491	54,345
Freezing	26,214	26,974	28,076
Curing (e.g. drying, salting, smoking)	9,917	9,686	9,832
Canning	11,091	11,487	11,994
For other purposes	31,106	32,354	28,277
Reduction (e.g. fish meal)	24,005	25,334	21,377
Miscellaneous purposes	7,101	7,020	6,900

Source: FAO Statistics

According to Delgado et al (2003), global consumption of fish as food has doubled since 1973, and developing countries have been responsible for over 90 percent of this growth. During this period, world per capita food fish consumption has risen from about 12 kg per annum to 16 kg per annum.

These increases have not been uniform across geographic or economic categories, however. Growth in food fish consumption has primarily been a developing-country phenomenon. China dominated aggregate consumption of fishery products in 1997, with over 36 percent of global consumption, rising from only 11 percent in 1973. India and Southeast Asia together accounted for another 17 percent in 1997, with total consumption doubling since 1973.

In particular, the consumption of freshwater fish has grown rapidly in recent decades, mainly in East Asia. Significant increases have also occurred in the consumption of crustaceans and non-cephalopod molluscs such as oysters and clams. In both cases, this growth in consumption has been matched by an equally rapid growth in production from aquaculture, primarily but not exclusively within Asia.

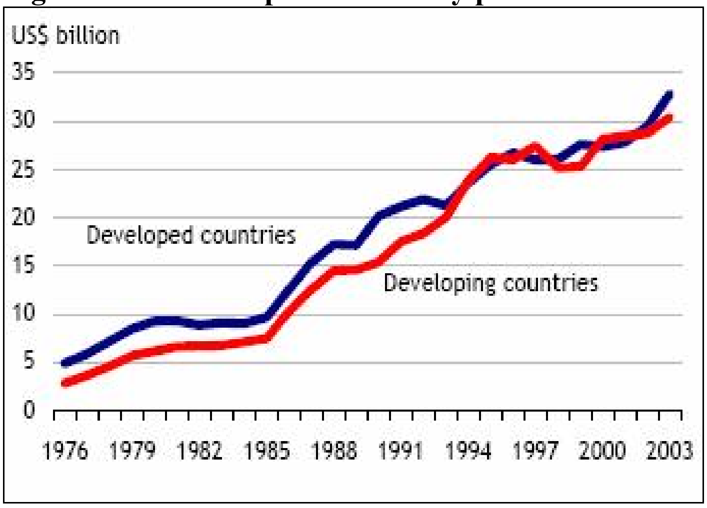
Delgado et al (2003, quoted in World Bank, 2004) predict that global per capita consumption of fish will increase from 15.7 kg in 1997 to 17.1 kg in 2020. However, there will be significant regional differences in that the bulk of the increase is likely to take place in developing countries, whilst consumption in developed countries is predicted to slightly decrease or remain relatively stagnant.

3.3 Trade

According to FAO statistics, China, Thailand, Vietnam, Chile, Indonesia, India, Taiwan, Peru and South Korea were the main developing country exporters in terms of value of fisheries products in 2003. The EU is globally the most important exporter with Norway, USA, and Canada being other major players amongst developed countries. Denmark, Spain, Netherlands, United Kingdom, France and Germany are the principal EU exporters (also see Table 5 and Figure 2).

The export value of internationally traded fish and fisheries products was US$ 58 billion in 2002, exceeding the combined value of net exports of rice, coffee, sugar, and tea (World Bank website, January 2006). In 2003, the total value of fisheries exports was of the order of US$ 63 billion. The rapid increase of fisheries exports from both developing and developed countries over the last three decades is illustrated by Figure 2.

Figure 2: World exports of fishery products



Source: FAO (no date)

Developed countries absorb 82 percent of total fish imports by value but only 65 percent in volume with Japan, USA, and the EU being the principal destinations (FAO, no date). Table 5 provides details of the main species, types of fish, and fishery products internationally traded, indicating that shrimp is by far the main product traded followed by groundfish (e.g. cod, hake, haddock), tuna and salmon. Table 6 and Figure 3 provide details of the main exporting and importing countries of fisheries products.

While LIFDCs (Low-Income Food Deficit Countries) accounted for 20% of fishery exports in value terms in 2002, the share of all developing countries combined in fishery exports was 49% by value and 55% by quantity. The net receipts of foreign exchange (i.e. export minus import values) for fishery commodities by developing countries increased from US$4.0 billion in 1982 to US$17.4 billion in 2002 (Vannuccini, 2004). This illustrates to what extent the fisheries sector is a major source of income and foreign exchange earnings for developing countries.

Table 5: Main species / types of fish and fishery products exported, 2002 (value)

Species	Percentage of total export value
Shrimp	19%
Groundfish	11%
Tuna	9%
Salmon	9%
Small pelagics	5%
Freshwater fish	4%
Cephalopods	4%
Molluscs (other)	5%
Fish meal	4%
Fish oil	1%
Others	29%

Source: Lem (2004b)

It is expected that developing countries will continue to export high-value products and import low-value products, in particular small pelagics. Net imports into Africa (of low-value products) are projected to increase.

Table 6: International trade in fisheries commodities by principal importers and exporters, 2003 (in US$ 1,000)

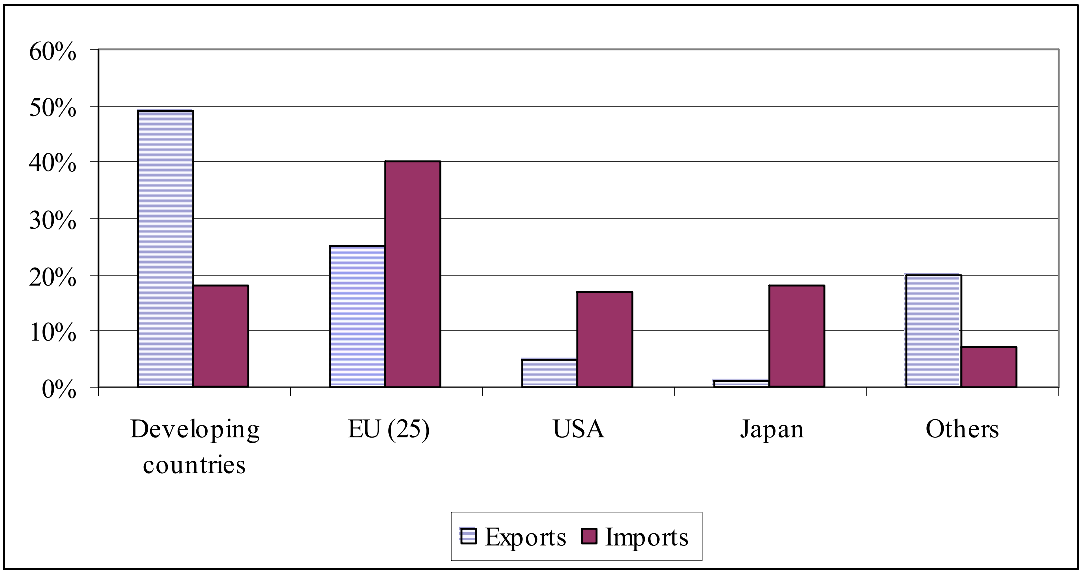
Importers		Exporters	
Japan	12,395,943	China	5,243,459
USA	11,655,429	Thailand	3,906,384
Spain	4,904,151	Norway	3,624,193
France	3,771,152	USA	3,398,939
Italy	3558,950	Canada	3,300,313
Germany	2,635,070	Denmark	3,213,465
United Kingdom	2,507,661	Spain	2,226,523
China	2,388,590	Vietnam	2,207,578
Denmark	2,084,573	Netherlands	2,182,588
South Korea	1,934,998	Chile	2,134,382
China, Hong Kong	1,752,420	United Kingdom	1,669,660
Netherlands	1,700,622	Indonesia	1,550,953

Source: FAO Statistics

3.4 Baseline scenario for SIA

This section provides the baseline scenario used for the sustainability impact assessment (SIA) of fisheries trade. Projections that are based upon economic fundamentals alone (i.e. that do not take account of WTO changes) show quite widely diverging scenarios. There are three major sets of projections for the global fisheries sector, which, since they do not incorporate WTO actions, can be interpreted as a baseline against which to assess the effects of such changes.

Figure 3: Main exporters and importers of fish and fishery products, 2003 (values)



Source: FAO (no date) FAO Support to WTO negotiations 4 – Fisheries trade issues in the WTO
NB: EU figures may include intra-EU trade.

There are two projections via FAO – for the purpose of this paper these are referred to FAO 2004 (FAO forthcoming), and FAO SOFIA (FAO 2002), and one also by IFPRI (Delgado 2003). A key difficulty is that these projections yield differing outcomes primarily because of differences in assumptions. The models project initial consumption and production trends, which produce pictures of global excess demand, and then use international trade as a price clearing mechanism to balance global supply and demand. On the production side the IFPRI model (baseline variant) is generally more conservative except for the capture fishery component. In contrast, the FAO 2004 projection indicates much higher levels of output from aquaculture with a consequent need for less substantial market clearing / price adjustment than in the case of the IFPRI model. The FAO SOFIA model generally produces results that are intermediate between those of IFPRI and FAO 2004.

In trade terms the three models predictions vary quite considerably. Only limited quantitative data are available in published sources for the FAO and SOFIA models, but Table 7 attempts to summarise outcomes by major countries and country groupings. The table shows volumes of net exports (IFPRI baseline variant, where negative figures indicate net imports), and projected trends in traded volumes for all the three models. An immediate difficulty is that published information for FAO models is not always sufficiently disaggregated, and that models sometimes use differing country groupings. None of the models use the groupings adopted in SIA studies.

Nonetheless certain major features and comparisons are possible via the available models. Overall both developing and developed countries are represented in the main net exporting group, whilst net importers are largely developed countries, although the latter picture is projected to change to a degree with an increasing presence of developing importing countries.

In terms of projected changes in trade, the models sometimes predict different outcomes, especially amongst net importing countries – i.e. Japan and the EU in particular. The IFPRI model also suggests a growth in developing country net imports, especially in Africa, but FAO model outcomes are less clear in this respect. Despite these disagreements there are also a number of important common findings via the models e.g. with respect to the positive performance by the main net exporters (in particular Latin America and China), and also over the likely increase in net imports into the US market.

Table 7: Net trade scenarios: IFPRI and FAO projections

Countries/country groupings (IFPRI definitions)	Net exports IFPRI 1997 ,000 tonnes	Net exports IFPRI 2020 ,000 tonnes	IFPRI 2020	FAO SOFIA 2020	FAO "2004" 2015
Other developed	2,919	3,631	▲	▼ (1)	n.a.
Latin America	2,435	3,047	▲	▲	▲
China	181	543	▲	▲	▲
S E Asia	1,131	482	▼	n.a.	n.a.
India	122	426	▲	n.a.	n.a.
Transition economies	507	189	▼	n.a.	n.a.
Japan	-3,112	-2,663	▼	▲	-
EU 15	-3,251	-2,443	▼	▲	▼ (2)
USA	-1,106	-1,528	▲	▲	▲
Mid East and N Africa	- 50	- 538	▲	n.a.	Net Ex.
Sub Saharan Africa	- 54	- 492	▲	▲	Net Ex.
Other S Asia	- 84	- 157	▲	▲	n.a.

Sources: FAO (2003b), FAO (2004) and Delgado et al (2003)
Notes: For net exports, negative figures indicate net imports
n.a. indicates data are not available, or that it is not possible to disaggregate information by the specified county/country group
▲ indicates forecast increasing trend from current position (either as a net exporter or importer)
▼ indicates forecast decreasing trend from current position (either as a net exporter or importer)
Net Ex = net exporters (under FAO models)
(1) Covers North America only
(2) West Europe (i.e. including major exporters such as Norway)

3.5 Projected WTO impacts on net trade

There are few available analyses that seek to quantify the impacts of WTO negotiations on fisheries trade, and for this reason Table 8 attempts to show the broad direction and scale of changes which might arise, based upon the findings of the case studies undertaken. The table shows that for current net exporters WTO impacts are likely to emphasise baseline trends i.e. net exports should grow further for Latin America and South East Asia based upon the findings of the Peru and Thailand case studies. In the case of Thailand the current concessions offered by the EU to Tsunami affected nations may provide the opportunity to assess the validity of these conclusions.

Table 8: Projected WTO impacts on net trade: Case study findings

Countries/country groupings (IFPRI definitions)	Possible WTO impact	Possible scale of impact	Case study countries
Other developed	Increase export	Small to medium	None
Latin America	Increase export	Small (e.g. Peru) to large (e.g. Chile, Brazil)	Peru
China	Increase export Increase import (some for re-export)	Medium Medium	China
S E Asia	Increase export	Large	Thailand
India	Increase export, Possibly increase imports	Medium Small	India
Transition economies	Increase exports Possible increase imports	Medium Small	None
Japan	Increase import	Small	Japan
EU	Increase import	Large	EU
USA	Increase import	Medium	USA
Mid East and N Africa	Increase export Increase import	Medium (e.g. Morocco) Small to Medium (e.g. Egypt)	None
Sub Saharan Africa	Decrease export Increase imports (e.g. in W Africa)	Medium to large Small to medium	Ghana, Uganda, Seychelles
Other S Asia	n.a.	n.a.	None

Source: Case studies for this report, and authors' estimations

Overall it is expected that India will benefit from further trade liberalisation. The country is likely to gain in terms of better access to export markets, however in some markets it might suffer preference erosion and would also need to continue to adjust to meet SPS and TBT requirements. Possible required changes in subsidies could also be important. In contrast, reductions in domestic tariffs could open up the Indian market to import penetration, although tariff reductions to date have had little impact.

For net importers the table shows again that WTO impacts generally re-enforce those trends apparent in baseline scenarios (but bearing in mind the disagreements in conclusions for at least some of the latter). For the EU in particular and also the USA the expectation is that significant expansion in imports will be generated through WTO impacts, whilst for Japan the outcome may be more muted. Given differing baseline expectations for the EU the overall outcome may be less clear, but many economic fundamentals in addition to WTO effects point towards expansion in imports across a wide range of fishery products for the EU.

For net exporting developing countries preference erosion is likely to be a major factor leading to reduced exports and hence declining net exports overall. A possible mitigating factor could be promotion of south-south trade but this appears unlikely to develop fast enough in the short term to offset the full WTO effects. Medium and longer term opportunities may be greater but competition from established major suppliers, especially those in Asia, could be problematic.

As noted earlier there has been little analysis of the quantitative impacts of WTO action on fish trade, and still less that has sought to distinguish between trade creation and trade diversion effects. A partial exception is provided by recent UNCTAD work (UNCTAD 2005) which looks at trade creation and diversion for selected fishery products, and for a small number of countries affected by preference erosion. Overall trade diversion effects appear somewhat greater then trade creation. For example, the UNCTAD simulations envisage that under a free-trade scenario Mozambique would be a major losing supplier of frozen shrimps and prawns to the European Union, whilst Argentina would be the first gaining supplier. In the case of octopus, supplies to Japan look likely to be diverted from suppliers such as Mauritania towards Morocco. In addition, the study envisages some trade creation for fresh and chilled fish fillets destined for the EU market, with Kenya predicted to become the first gaining supplier.

Overall WTO impacts are likely to benefit a number of developing country exporters, but some will also lose as a result of preference erosion – notably ACP countries. Even for those countries that are likely to gain there are likely to be ongoing changes that favour larger scale producers and processors (e.g. via the impacts of SPS and TBT issues which can most easily be addressed by larger scale / more wealthy suppliers), at the expense of smaller scale enterprises including the poor. Whilst mitigation measures may offset some of these trade impacts, they are most likely to be in the medium and longer term.

Polaski (2006) estimates that as a result of the WTO Hong Kong Scenario the world export prices of forestry and fishery products combined would increase by 0.34% whilst the world import prices would increase by 0.36%. The study also indicates that overall gains from the Doha Round are only going to be modest, and whilst there will be winners and losers the poorest countries are amongst the net losers under all likely Doha scenarios.

4. The Impact of the Doha Round: Potential Tariff Reductions

The Doha Development Agenda (DDA) includes a number of issues of importance to international trade in fish and fishery products, in particular in relation to fisheries subsidies and market access. Section 4 provides an assessment of the impact of potential tariff reductions, while Section 5 assesses subsidies and Section 6 other trade issues. When analysing the impact of the DDA in relation to sustainable development one must bear in mind that whilst this concept has four pillars (economic, social, and environmental, and process issues) preserving the very resource base (fish stocks in this case) is a condition *sine qua non*, i.e. without which long-term economic and social development in the sector would not be possible.

4.1 An overview of the Doha Round and tariffs

It is important to note that fish and fishery products are not covered by the WTO Agreement on Agriculture, but fall into the same category as industrial goods. As a result, market access for fishery products is being discussed in the Non-Agricultural Market Access (NAMA) Negotiating Group.

After the completion of the Uruguay Round, average weighted import tariffs on fish products were reduced to the current 4.5% in developed countries (Lem, 2004a). Although this may seem quite low, the average hides a number of very high tariffs for selected species and products ("tariff peaks") as well as cases of tariff escalation where processed or value added fish products are subject to higher duty than unprocessed fish. Import duties in some developed country markets continue therefore to present a barrier to processing and economic development in the fishery industries in developing countries (especially those not benefiting from trade preferences), but also to a number of developed countries outside the large trade areas, for example non-EU members (Lem, ibid). Tariffs on fish and fishery products are generally higher in developing countries, which poses problems to the development of South-South trade.

As part of the on-going WTO trade negotiations, the EU favours tariff reductions based on a Swiss formula with flexibilities for developing countries[2]. Although coefficients have not been agreed as yet, it is likely (i.e. hoped) that this will result in maximum tariffs of about 10% for imports into developed countries and about 15% for developing countries (i.e. tariff reductions of about 50% and 30% respectively). The overall tariff structure will be flatter with less pronounced peaks, and implementation could start in the second half of 2008, assuming that the current round of negotiations comes to a conclusion at the end of 2006.

[2] The Swiss formula has the form of $t1 = (A \times t0) / (A + t0)$, where t0 is the original tariff, t1 is the new tariff, and A is a coefficient to be negotiated (Melchior, 2005). The Swiss formula is non-linear by cutting larger tariffs relatively more than low tariffs.

The EU rejects a sectoral approach and zero-duties which have been proposed by a few WTO members (e.g. USA and New Zealand). Products that would be mainly affected by tariff reductions include: tuna, shrimps, sardines, anchovies, hake, herrings and some farmed fish such as trout, sea bream, and sea bass.

4.2 The issue of preference erosion

The issue of preference erosion has been increasingly highlighted by ACP and least developed countries (LDC) that have preferential access to the markets of industrialized countries. Table 9 details the 20 LDCs benefiting most from market access preference in the EU, Japan, and the USA.

Some current examples of preferential treatment include:

- The Generalised System of Preferences (GSP) which provides preferential access for some developing countries. For example, Peru is a beneficiary of the special incentive arrangement for sustainable development and good governance and EU imports from Peru are exempt from duty.
- LDC exports enjoying significant preferential margins in the three major markets (i.e. EU, Japan, USA) include, *inter alia*, fresh or frozen fish (margin of 10% to 22%, depending on the market), octopus (8%), preserved tuna (9% - 24%) (UNCTAD, 2005).
- As part of GSP, imports of fish from countries such as Thailand and India into the EU benefit from a reduction of duty of 3.5% (e.g. 20% becomes 16.5%). At the same time, the new EU GSP regulations, which came into force on 1 January 2006, contain measures that directly benefit countries affected by the tsunami in South East Asia. For example, according to a European Commission press release of 10/02/2005, Thailand and Sri Lanka benefit from new product coverage – mainly fisheries products – as a result of which tariffs for Thai shrimp fell from 12% (Most Favoured Nation rate) to 4.2%.
- Also, there are tariff quotas for fisheries products such as canned tuna and tuna loins. For example, Thailand, the Philippines, and Indonesia currently share a tariff quota of 25,750 tonnes[3] of canned tuna imported into the EU (tariff 12% instead of 24%).

Developing countries benefiting from preferential market access in developed countries fear that tariff cuts resulting from the current WTO round of negotiations will erode the value of those preferences.

Whilst the provision of non-discriminatory (i.e. most-favoured nation, or MFN) access to each other's markets is a fundamental principle of the WTO, it permits trade preference programmes in order to stimulate development (Fisher, no date). To promote

[3] Thailand 52% of the volume, the Philippines 36% of the volume, Indonesia 11%, and other third countries 1%.

development and export-led growth in the developing world, various WTO exceptions allow members to give developing countries tariff treatment that is lower than the MFN tariff that a member guarantees to all other members.

Table 9: The 20 LDCs benefiting most from market access preferences in the EU, Japanese and US markets in recent years

Countries	Relevant products
Angola	Crude petroleum oil and preparations thereof; **cuttlefish and squid**
Bangladesh	**Frozen fish, shrimps and prawns**; urea; leather; jute fabrics and bags; garments; linen; tents; footwear; hats
Madagascar	**Frozen shrimps and prawns**; vanilla; cloves; **preserved tuna**; garments
Senegal	**Fresh and frozen fish and fish fillets**; **cuttlefish and squid; octopus;** crude groundnut oil; **preserved tuna;** leather footwear
Cambodia	Garments; leather footwear
Nepal	Wool carpets; garments; hats
Democratic Republic of the Congo	Crude petroleum oil and preparations thereof
Myanmar	Garments; leather footwear
Mozambique	**Frozen shrimps and prawns**
Mauritania	**Fresh and frozen fish; cuttlefish and squid; octopus**
Malawi	Tobacco
Tanzania, United Republic of	**Fresh and frozen fish fillets; octopus**; fresh cut flowers; tobacco; preparations of petroleum oil
Uganda	**Fresh and frozen fish fillets**; fresh cut flowers; tobacco
Sudan	Crude groundnut oil
Equatorial Guinea	Crude petroleum oil
Solomon Islands	**Preserved tuna**
Yemen	Preparations of petroleum oil
Lao People's Democratic Republic	Garments
Zambia	Fresh cut flowers
Guinea	**Fresh fish**

Source: UNCTAD (2005)

NB: (a) Ranking of countries and identification of products are based on UNCTAD data on foreign exchange earnings from exports of goods and services.

(b) There are other major developing country exporters of fishery products, which are not presented on this list, either because they are not LDCs or their total exports entering developed country markets under preferential market access are less than those of the 20 countries presented in the table. The following countries were the main ACP countries (value wise, in descending order) exporting fish products to the EU in 2002: Namibia, Seychelles, Senegal, Madagascar, Cote d'Ivoire, Mauritania, Tanzania, Ghana, Cuba, Mauritius, Mozambique, Uganda, Nigeria, Kenya, Angola, Bahamas (Source: Lem, 2005).

The socio-economic impact of market access preferences for exports from LDCs are often particularly important. As a result, erosion of market access preferences for LDCs arising from most favoured nation (MFN) tariff reduction and regional free trade arrangements was underlined as one of the most serious challenges to LDCs in their efforts to overcome their competitive disadvantage in the global economy (UNCTAD, 2005).

In view of this the SIA of fisheries trade has attempted to shed more light on the issue of preference erosion in the case studies, the findings of which are presented in the following section.

4.3 Assessment of tariff reduction impacts

In theory, a reduction in tariffs will lead to higher producer prices in countries exporting to the country that lowers the tariffs, although probably not by the same margin as the reduction in tariffs (OECD, 2003). On the other hand, producer prices in the country lowering the tariffs would be expected to decline. At the same time, in the case of fisheries trade the impact of a relaxation of trade barriers such as tariffs is highly dependant on the type and effectiveness of fisheries management regime in place (i.e. open access, catch control, and effective management) as illustrated in Table 10. For example, if the fisheries management regime is weak then a country with a comparative advantage in fishing may only gain in the short-term as a result of tariff reductions, but lose in the long-term as a result of overfishing.

Table 10: Effects of relaxing trade barriers in fisheries trade

	Fish exporting country			**Fish importing country**		
Regime:	Open access	Catch control	Effective management	Open access	Catch control	Effective management
Short-term effects	Increased effort, larger catches, more trade, gains from trade	Increased effort, no change in catch, higher profits, gains from trade	No change in effort unless higher allowed catch, gains from trade, higher market value of quotas and licenses	Lower effort, smaller catches, more trade, gains from trade	Lower effort, no change in catch, lower profits, gains from trade	No change in effort unless smaller allowed catch, gains from trade, lower market value of quotas and licenses
Long-term effects	Fish stocks decline, catch may decline, possibly loss from trade	Increased investment in fishing boats, no change in catch, small gains from trade	Same as above	Fish stocks recover, catch may increase, “double dividend” from trade	Reduction of fishing fleet, no change in catch, “double dividend” from trade	Same as above

Source: OECD (2003, p 170)

NGOs such as Friends of the Earth expect negative impacts on both fish stocks and fisherfolk as a consequence of tariff cuts resulting from the NAMA negotiations (Friends of the Earth International, 2005). Amongst other things, this is based on the assumption that the proposed tariff reductions "will increase incentives to fish internationally, especially with large commercial trawlers, in turn fuelling further exploitation". Some trade observers expect that a decline of producer prices in some countries may not necessarily lead to reduced fishing effort but more competition in that companies will try to compensate for lower prices through larger quantities produced (i.e. economies of scale). In particular, this is likely to happen if there is no catch control or an ineffective fisheries management regime in place.

The following sections summarise the findings of the case studies as to the impact of potential WTO tariff reductions for different country groupings. The country case studies were based on the assumption that import tariffs in developed countries would be reduced by 50% and those in developing countries by 30% (also see above).

4.3.1 Economic impacts

European Union

If further liberalisation of seafood trade does occur, tariff reduction will be the factor that has the most significant impact upon the EU fisheries sector. This is because large segments of the seafood processing industry seem unlikely to be able to compete with developing country imports without tariff protection. The implications of trade liberalisation for the EU tuna industry appear serious in that it is hard to see how the Spanish industry could remain competitive in the mainstream market if tariffs were to be halved, and removal of all tariffs would be even more damaging. The outcome would probably be the Spanish industry following its Italian equivalent into a specialist high quality niche arena that relies upon strong national brands and imported tuna loins to reduce production costs. Loss of a significant number of jobs (e.g. perhaps 50% or more of the current strength) would be expected to follow.

In addition to tuna canning, small pelagic canning, whitefish processing and shrimp processing all seem likely to suffer. This will be exacerbated where low cost raw material (farmed shrimp, farmed or wild whitefish) is sourced from developing regions, as there will be strong incentives to process where production takes place rather than in the EU.

Primary producers (ground fish and shrimp fishers) could also be disadvantaged as competition from imported cheap whitefish and shrimp will hold prices down at a time when quotas, low catch rates and high costs (especially fuel) are already jeopardising the industry.

Overall, the effects seem likely to be felt most severely in the EU fish canning sector, and particularly in the tuna industry of the Mediterranean countries. Small pelagics canneries throughout the EU including the north (especially the Baltic region including Scandinavia, the Baltic States, Eastern Germany and Poland) will also be under threat.

In the short-term, there will be an economic shock to the EU (i.e. in particular the Spanish) tuna canning industry which will be unable to compete with SE Asian canners in price sensitive market segments. In addition, there might be possible follow-on difficulties for the EU tuna fleet from reduced output from key customers (i.e. ACP and EU canners). Also, EU shrimp fisheries are likely to face low commodity prices and need to focus on premium fresh markets that imports do not threaten.

Traditional whitefish supplies may be increasingly supplanted by cheap farmed tropical alternatives, reducing prices for already pressed EU ground fish fleets. EU primary seafood processors will see the move to low cost areas accelerate. Expansion of foreign markets for small pelagics could help some northern fisheries. However, this will frustrate Eastern European hopes of developing a seafood processing sector as it becomes cheaper to relocate further east. Duties are low on most salmon products, so the impact will be muted, except perhaps for added value items (smoked) from Chile.

In sum, the long-term impacts will result in a severe decline of the EU tuna canning industry to become a small niche player producing premium products for a discerning high cost market. There will be related problems for the EU tuna fleet as it loses some market advantage, which may be exacerbated by loss of access if FPAs were to be abandoned or downscaled. There will be a reduction in some parts of the shrimp industry – both capture and processing. There will be a continued severe decline for the whitefish processing industry, with the promised relocation to Eastern Europe forestalled by Asian competition.

There will be a general move within the EU fisheries sector to supply premium fresh products that are more immune to import competition. A reorientation of the EU small pelagic fisheries to exploit expanded markets (e.g. Russia, Turkey) and better prices in third countries is likely to take place. The overall impact will result in an even larger EU seafood trade deficit with the rest of the world.

In contrast to the general picture of losses in production and processing, quite considerable economic benefits are likely to accrue from tariff impacts to the retail and food service sub-sectors, as well as to the consumers, as a result of falling prices. Consumer benefits will depend on price reductions being passed on by the food service industry and retailers and not being captured by the latter (e.g. supermarket chains).

Other developed countries – Japan and USA

Whilst duties in the USA are generally of limited significance, suppliers, especially low cost developing country producers, face the potential threat of anti dumping measures e.g. with shrimp and other products. The latter measures have been directed in the past against a number of Latin American and Asian suppliers.

In Japan there is a similar structure of lower rates on raw material items and higher rates on processed products although the pattern and rates differ to a degree from the USA.

Overall, further reductions in tariffs could therefore have some impacts notably for those products where rates of around 10% or above currently apply (i.e. groundfish products in both the USA and Japan). The likely outcome would be a further shift of processing activity (especially labour intensive components), to Asian producers. Similarly whilst rates for shrimp and prawn are relatively lower especially in the USA, tariff reductions could have some impact with scope for Latin American and Asian producers to strengthen their position in processed product markets. Canned tuna is a much smaller market in value terms compared to those for fresh/frozen shrimp and groundfish, but reductions in tariffs could be important given current rates for non-concessionary countries. Again supplying countries to benefit would most likely be in Latin America and Asia.

Tariff changes are unlikely to impact on levels of Japanese consumption given current duty levels, but there could be some effects in the USA. In the US market changes could strengthen existing consumption in high value fish and crustacean markets in particular and have a more marked effect in trade terms because of the likely ongoing transfer of processing capacity to low cost producing countries. Thus the growing deficits in these items could be emphasised. Impacts in Japan are likely to be more muted with regard to trade and processing patterns.

Non-ACP/LDC developing countries

China. With WTO membership China has already undertaken a series of tariff reductions in the fisheries sector, i.e. on average import duties have fallen from 15.3% in 2001 to 10.4% in 2005. These tariff reductions appear to be stimulating trade, but apparently there have been no detailed analyses of this feature to date. For edible products the new bound rates overall are generally quite low and as such further tariff reductions may have little effect. This is even more the case for fishmeal which is imported under a 2% tariff and thus downward adjustment is not a significant issue. Reductions in tariffs may have some impact e.g. by stimulating increasing imports of raw material for processing – such as those for domestically marketed products (although re-exported products can claim a rebate and hence tariff changes are neutral). Similarly for higher value fish/products which are an area of growing demand, tariff reductions could induce further expansion. In respect of the latter the reduction in duties on shrimp may be significant.

More important outcomes might be expected to arise from the impacts of any tariff changes that may take place in China's major export markets – notably the USA and Japan. However, in both countries tariffs, both current and prospective, are not particularly high and other aspects are likely to have greater impact (e.g. anti-dumping or SPS measures). Thus for the USA duties on frozen fish, molluscs and shrimp and prawns are zero rated, although some processed products attract duties (e.g. 7.5 percent on some processed fish and 5 percent on canned shrimp). Overall tariffs are therefore of limited importance for China in major export markets – especially in comparison to economic fundamentals such as low domestic labour costs.

A more important factor for trade may be the future course of anti-dumping activity, notably by the USA, which has imposed measures upon Chinese products in the past e.g. on crawfish. Despite the imposition of anti dumping measures, Chinese exports of crawfish have continued, but this might not be the case for future US action. An additional factor is the application of, for example, SPS measures.

India. In economic terms, for a net exporter of fish like India, the impact of more relaxed tariffs is likely to be positive as it offers the opportunity to consolidate its market share and diversify into other markets. Preference erosion could lead to somewhat reduced profitability of the export sector in the short term, but might prove to be a positive change in the long term as it makes the supply chains more competitive and diversified, hence less risk-prone.

As for imports, consumers, importers, retailers, processors (who intend to use their idle capacity for reprocessing the imported fish for re-export) would benefit from reduced tariffs, but this is perceived to be at the cost of livelihoods and incomes for different categories of stakeholders in the sector, whose capacity to hold on to their share in the value chain in the face of competition from imported goods is very limited. As yet, fish imports into India are low (i.e. approximately one percent of exports) and have not significantly increased following the relaxation of import regimes over recent years. The proposed Free Trade Agreement (FTA) with Thailand for the import of fish for reprocessing and exports led to protests by fishermen in Kerala, who complained that the imports would affect their livelihoods adversely. At the same time, the Seafood Exporters Association of India (SEAI) argues that fish imports from Thailand would address the issue of shortage of raw material in the country, which in turn would also lead to job creation. In sum, India may face some increased fish imports but not necessarily as a result of the current Doha Round negotiations. On the other hand, the country's net export position is likely to further improve as a result of the negotiations.

Peru. No significant effect on real income is expected overall, but there may be some possible effects on diversification by artisanal fishermen to specie at another price level. Levels of trade of major products are controlled by government quotas, therefore WTO measures would not be felt.

No direct effects are expected on current employment levels in the industrial plants and fleet that represents 21.5% of the labour force in the fishing sector. Equally, no direct effects are envisaged for artisanal fishermen who are self employed along with family members and represent roughly 50% of the fishing sector labour force. There could be some negative effect on female fish processors (10% of labour force) if squid imports were reduced, but this could be replaced with the canning of other species that are a growth industry.

Fixed capital formation in current business is likely to remain unchanged being a mix of private investor and bank debt. This could change and increase as new money is invested in government encouraged expansion of processing facilities and aquaculture farms. Bank indebtedness in the fishing sector peaked in 1998, in part due to the El Niño effect and excessive capital investment at a time when there was a downturn in production. Current debt is now more manageable.

Thailand. In the short-term, large increases in employment and income generation by the tuna canning industry can be envisaged. Likewise, increased shrimp production will take place, but most likely at the expense of alternative coastal production of rice or other coastal crops. Antidumping challenges are already causing market upheaval and threatening seafood trade. At the same time, perversely, Thailand appears to be the beneficiary at present, but this western response to competition seems likely to persist and could threaten Thailand in the future.

Two forces seem set to determine the long term economic effects of liberalisation upon the Thai seafood sector – (i) the benefits of the opening of OECD markets and (ii) the threat of competition from Thailand's neighbours.

On the one hand, Thailand's efficient, highly competitive producers and processors would have the potential to expand their already impressive impact upon global seafood trade substantially. Shrimp farming/processing and tuna canning are obvious candidates for expansion, but given Thailand's flexible and entrepreneurial approach, there is no reason why new areas cannot develop. Indeed a move into sophisticated added-value seems an obvious response to fast rising demands for highly finished convenience products in the west.

On the other hand, liberalisation will allow Thailand's key competitors greater scope to undercut Thailand. Progress across the industrial board has naturally led to rising prosperity – and thus wages - in Thailand. This process was halted by the 1997 Asian economic crisis which had the inadvertent effect of re-establishing Thailand's' labour-competitiveness by both devaluing the Baht and capping wage rise pressures. This was a "one-off" though and the normal process of well merited rising prosperity has resumed. Thus one of Thailand's main advantages – low cost/high quality labour – will erode continually. Seafood industries, especially processing, are not occupations of choice and Thai labour is likely to move towards better paying and more congenial hi-tech jobs. This will leave the seafood industry in a quandary – whether to import cheaper labour or to migrate their activities to lower cost areas like Vietnam, Indonesia, Brazil or China. The betting must be on the latter – whether constructively managed by Thai companies or as a result of their competitors' ascendancy.

How this will play out eventually is impossible to judge at this point – because, for example, Thailand's rising prosperity (and wages) will similarly be experienced by the regional competitors. And overlying this, there could also be major changes in the market with China and possibly India becoming major seafood importers as these huge economies continue to modernise and prosper. The West and Japan may then cease to dominate in the way they do now. Thus the outcome for Thailand will rely upon a very complex interplay of regional and global economic forces.

ACP/LDC countries

Secondary literature and case study analysis of the possible impacts of the Doha Round indicate that a substantial reduction of tariffs on imports into developed countries (i.e. by about 50%) is likely to have a negative impact on ACP/LDC countries that largely depend on preferential market access for their exports. This is due to preference erosion resulting in the loss of their competitive advantage, which in turn is expected to lead to lower profits as a consequence of declining prices and lower volumes traded.

Ghana. If import tariffs in OECD markets were to be lowered to about 10%, then the quantity of smoked fish and tuna exported from Ghana is expected to be significantly reduced given that most of the processing industries would become uncompetitive. It is projected that export receipts from smoked fish and tuna would decline by 30% and 50%, respectively. This would consequently affect the income levels of the companies involved, and, in turn, Government revenue from taxes and licences would also be negatively affected.

Seychelles. WTO induced tariff reductions would lead to substantial loss of IOT (i.e. tuna cannery) employment in Mahe, though the direct impact would be mitigated by much of the workforce being foreign – i.e. the impact may be felt in the Philippines as much as in the Seychelles. There would be reduced income for the population of Mahe and associated lower spending power. There will be knock-on effects to support industries, especially the can fabricating plant and other subsidiary industries supplying to the cannery. The reduction in frequency of cargo vessels visiting Port Victoria would lead to an overall lowering of economic activity. There could also be an indirect effect on tuna transshipment. Were similar difficulties to affect the Mauritian and Malagache canneries, then regional demand would slump potentially undermining some of the case for transshipping in the Seychelles, so severely reducing the sector's economic "critical mass".

Uganda. A lowering of tariffs as a result of WTO trade measures is expected to reduce Nile perch exports because of increased competition from substitutes in overseas markets (i.e. mainly the EU). Stakeholders fear that the incomes of fish firms as well as fishermen will be reduced through reduced prices offered by exporters. Fish processing firms would respond to increased competition by lowering production costs through reduced employment in factories. Lower foreign exchange earnings are expected to lead to exchange rate instability.

At the same time, the potential competitors of Ugandan Nile perch (e.g. catfish from Vietnam) face relatively low tariffs in the major markets (e.g. 9% in the EU, which could be reduced to about 5% following further trade liberalisation). As a result, the consequences for Ugandan white fish exporters are potentially less severe than expected.

4.3.2 Social impacts

European Union

Social impacts are generally linked to the economic outcomes already noted. Loss of livelihoods in fishing communities may be particularly significant since in some cases there may be few alternative options available. Moreover where processing as well as capture fishery are involved there may also be important gender implications (e.g. because of impacts on women's employment in processing factories). Effects may also be concentrated in particular regions with wider knock on effects for local economies (e.g. in Galicia and the Basque coast in the case of tuna processing, or in Scotland in the case of smoked salmon).

Other developed countries – Japan and USA

In the USA a number of WTO impacts are likely to arise which could have social implications at local and regional levels. The two larger examples are for shrimp and tuna. In the case of shrimp both production/catch and processing may be reduced which is likely to affect Louisiana in particular (but also shrimp processing more widely). These impacts could exacerbate the already major social disruption arising from Hurricane Katrina. Tuna (canning) may also be subject to greater competition placing a threat on canneries in US dependencies of Puerto Rico and American Samoa – with knock-on effects on employment and associated potential difficulties at household and community levels.

In the salmon sector cheaper farmed salmon could extend penetration of the US market which could have a significant impact on the Alaskan salmon sector both in terms of catch and processing (canning). In the catch sector Indian communities which have special access to the fishery could be most affected, especially since they have few alternative livelihood options. Similarly a decline in the cannery sector would affect communities in Alaska and the Pacific North West which again have few alternative employment options. Finally the East coast salmon farmers in Maine might be affected by competition from imports.

The overall impacts of WTO measures are more constrained in Japan in comparison to the USA. The Japanese fleet has already contracted to a large degree and further significant change is less likely. However, WTO effects may influence the location of processing, especially in the groundfish sector where current tariff protection is relatively higher. Impacts at community level may well include social components including gender issues because of the loss of female employment.

Non-ACP/LDC developing countries

China. The larger scale processing sector will offer employment and income opportunities, but these may be partly at the expense of potentially more labour intensive smaller scale enterprise. If export processors also move in to supply the greater part of the growing domestic market for processed items, these effects could be significantly greater. In location terms the expectation is that export processing will remain focused in coastal regions – areas where environmental pollution issues are already often the most intense.

India. In social terms, the producers are expected to be affected both due to preference erosion as well as due to competition at sea and at the market place by new players and products, but on the other hand the increased access to new markets and demand for species other than fish might offset this. For the secondary stakeholders (particularly women, *dalit*s and other vulnerable people), the overall impact of lifting of tariffs is likely to be more negative than positive as this can hurt their current livelihoods, while not really offering an affordable means to take advantage of the new opportunities this may present. In terms of quality of life, the increased impoverishment of some categories of people might weaken their conditions of life, while the increased availability of fish at affordable prices (potentially also as a result of imports) might enhance consumers' access to cheap protein and improve nutritional security.

Peru. Poverty is an eternal problem in Peru due to potential workers entering the work force faster than jobs can be created. Despite impressive GNP growth in recent years, the downward trend in the poverty level has not been commensurate. The fishing sector has been fairly stable in this respect and no deterioration is foreseen in the current situation. Tax and other revenues arising from fishing activities are now being redirected from central government back to the fishing regions for investment in infrastructure including educational and health facilities. An improvement in these areas is already being reported.

Thailand. In the short-term, gains are expected for the urbanised and semi-urban workforces in employment in tuna canneries. Similarly, rural workforces will see increased employment on shrimp farms and processing plants. In turn, there will be gains for small businesses supplying these industries, including the small "satellite" shrimp farmers. At the same time, fears were expressed regarding potential losses for freshwater farmers and fishermen as cheaper imports might displace their products or lower their prices.

In the long-term, the changes seem likely to be mostly beneficial to the Thai workforce if not the sector (i.e. a "prosperity problem"). Social problems already associated with foreign labour used in the fisheries might be replicated in the processing and aquaculture industries. At the same time, there might be a decline in rural smallholder agriculture (rice especially) from commercial shrimp farming, disadvantaging the communities involved who may be displaced

ACP/LDC countries

Ghana. The potential knock-on effect of rising poverty in rural communities will include, among others, declining standards of living and rural-urban migration. If income to fisher-folk are cut or reduced as a result of reduced purchases by exporters, it is more than likely that the living standards of families, particularly education, nutrition and general health of children, will be affected. Likewise, some of the people, particularly the youth, would attempt to escape the poverty by migrating to the towns and cities, with its attendant social problems and strains and stresses on urban infrastructure and facilities. Part of the workforce employed in tuna canning may also lose their jobs.

For the foreseeable future it is envisaged that Ghana will continue to export high-value demersal fish species and tuna and import low-value fish such as Sardinella, and Mackerel to supplement the domestic supply. At the same time, fears have been expressed by certain sector stakeholders that the increasing export of high value species could result in declining availability and consumption of these types of fish locally.

Box 1: Women's livelihoods and their role in fish processing in Ghana

As active participants in the fisheries sector and home makers, the impact of trade negotiations could have far-reaching implications for women's livelihoods and the wellbeing of families. In a study in Elmina, Ghana, a major fishing community, it was found that women's incomes in the community varied depending on whether the fishing season was good or bad. For small tradeswomen, the income can increase from US$25 to US$40 per month. Fishmongers of relative importance earned between US$112 and US$470, whilst larger-scale fishmongers earned between US$430 and US$2,092. It must be stated that the most important part of their annual income is earned during the high season from July to September. The bulk of the income that women fish processors and mongers receive from their activities is spent on providing food for their families. The women also spend on medical care for their children, provide clothing and, to a lesser extent, pay school fees. Besides catering for their family needs, women also fund fishing inputs, mainly the purchase of fuel, from their savings (Odotei, undated). The above illustrates the typical role played by women in fishing communities. Should the women's ability to play this role be affected as a result of the proposed trade liberalization (e.g. tariff reductions in the major export markets may make smoked fish exports less competitive), then this may have serious knock-on effects on the nutrition, health and general wellbeing of fishing families.

Source: Antwi (2006), Ghana country case study.

Seychelles. The knock-on effects of the reduction in employment in the tuna processing industry would be lower earnings/increased poverty amongst the Mahe workforce and that of firms supplying to IOT. The reduction in overall economic activity and thus in tax receipts by government would lead to lowered capacity to provide key state services such as healthcare, and education.

Uganda. There are concerns that unemployment amongst fishermen and factory employees might go up (including for women in that 30% of the employees in fish processing plants are female) leading, in turn, to increased poverty levels and indebtedness with negative knock-on effects on other social indicators. At the same time, as already stated above, the Ugandan Nile perch export sector is unlikely to be affected to a large extent by tariff reductions or preference erosion.

There are claims that food security has been affected in Uganda as a result of fish exports. Although there is less Nile perch and tilapia available for the domestic market, this needs to be weighed against the substantial amounts of income generated by the fishing industry, which in turn positively affects people's access to food. At the same time, income generated in the fishing communities has often not been invested in productive enterprises or saved as a result of lack of saving infrastructure. Keizire (2004) argues that there are also fish species other than those exported which are available in Uganda for domestic consumption. Whilst tilapia is the preferred fish consumed by local communities around Lake Victoria, some observers argue that Nile perch is traditionally not eaten because it is not an indigenous species.

Nevertheless, in particular in famine situations, there are poor communities around Lake Victoria that have come to rely on the consumption of fish bones and other by-products from the processing plants. Attempts by the animal feed industry to purchase increasing amounts of these by-products have been curtailed by East African governments so that they remain available for human consumption (personal communication: Mr Stephen Mbithi Mwikya).

4.3.3 Environmental impacts

European Union

In theory at least the growth of cheaper whitefish supplies from farmed fish in developing countries if coupled to strengthening of fisheries management systems and reductions in catch allowances for EU whitefish could enhance the potential for fish stock recovery in EU waters. The latter would apply to the lower value whitefish most affected by competition, (i.e. mainly gadoids such as cod and hake). However lower EU catch/production could have offsetting effects in developing countries if expanding cultured fish production and/or more intensive methods leads to environmental degradation. The extent of the latter will depend on the nature of management systems that are adopted and the efficacy of their implementation.

As for environmental impacts, capture primarily depends on catch control. As a consequence, increased imports do not necessarily mean less pressure on domestic fish stocks in that catch size will be determined by quotas.

Other developed countries – Japan and USA

In economic terms, the US shrimp sector in the Gulf of Mexico may be adversely affected by increasing competition from imported products. The possible environmental aspects of short to medium term Doha effects are clouded by the substantial impact which already exists because of Hurricane Katrina. Potential recovery of the fishery and environmental implications which arise from this are therefore particularly difficult to predict. Elsewhere the possible decline in Alaskan salmon catch may lead to increased stock levels, whilst reduction in cultured salmon production in Maine could have some small positive and localised environmental effects.

In Japan WTO impacts are relatively muted, with consequent implications for any possible environmental change, but there may be ongoing encouragement towards more effective management of marine fisheries resources in collaboration with regional neighbours, especially China.

Non-ACP/LDC developing countries

China. There continue to be major environmental pollution problems in China, in both inland freshwater bodies and in coastal marine areas. In both cases a significant contribution to problems is made from outside the fisheries sector (i.e. by agriculture and by industry). However, fisheries components such as the cultivated shrimp sector which may be stimulated as a result of WTO induced effects may represent both a threat and an opportunity in environmental terms. The shrimp component, like Chinese aquaculture more generally, is currently characterized by relatively low intensity production techniques, and changes towards more intensive systems could have major environmental ramifications. The wider fish processing sector (including reprocessing for export) is also largely located in coastal areas and as such relatively rapid growth partly as an outcome of WTO effects, may lead to further environmental pressure.

However there is scope for some offsetting positive change. In the catch sector as a whole China has sought to improve management in regional waters (working with regional partners) in an attempt to improve ecosystems more generally and to turn around the decline in stocks, especially of demersal species. It has also reacted quite quickly to trade induced needs for specific catch practices (e.g. use of turtle friendly fishing gear), and in aquaculture (e.g. over problems with use of antibiotics). Ongoing trade related stimulus e.g. via eco labeling could also have some effects at the margin.

India. In view of the exporters' traditional emphasis on shrimp, as a result of various trade measures the producers might decide to break out of the 'shrimp-trap' and diversify fishing and culture operations to target a number of other commercial fish species, thereby reducing pressure on inshore waters. Increased opportunities for export to new developing country markets might also support the shift away from shrimp, although shrimp will continue to remain a major export earner for the country. On the other hand, lowered tariffs, continued state support for export of shrimp and reduced margins due to trade measures (like SPS, TBT, antidumping and eco-labelling) might increase demand for shrimp and lead to more intensive exploitation and culture practices with implications on natural resource health, environmental quality and biodiversity.

There might be improved ecosystem management as a consequence of measures such as eco-labelling. If implemented well, the latter could improve ecosystem health, conserve biodiversity and contribute sustainably to the economic wellbeing of the sector. At the same time, there are also claims that the positive impact of eco-labelling on sustainable management and market diversification should not be overestimated in that, in the medium term, it appears only to provide niche markets.

Trade-environment nexus: although environmental concerns will continue to drive future TBT measures, they are unlikely to be addressed well in the short term. With increased trade-environment linkages, the tension between environmental conservation and livelihood needs will become more intense, with negative consequences for both.

Peru. The Marine Institute carries out regular research of the resource and records landings on a daily basis. The major species, representing about 98% of the resource, are protected by government measures to control over-fishing and fishing on juvenile recruitment. This guarantees a stable annual resource for extraction. Also, environmental quality is controlled by government resulting in the maintenance of pollution free conditions for fishing.

Thailand. The environment is expected to be the principal longer-term loser in the development process of the Thai seafood industry. Coastal zones eco-systems and wetlands (both coastal and inland) are under particular threat, and key agricultural areas like coastal paddy are under threat already.

Conversely, environmental problems threaten aquaculture, namely water shortages inland and pollution along the coast for shrimp farming. This, rather than the market or trade, may turn out to be the key constraint to growth in aquaculture output

ACP/LDC countries

Ghana. Preference erosion and subsequent decline of the local fish processing industry does not necessarily mean that there will be less pressure on Ghana's fish stocks. Depending on the species (e.g. tuna) the latter may be caught and shipped to fish processing facilities in countries which have a competitive edge. Ultimately, the quantities of fish caught will depend on the effectiveness of the fisheries management system in place. At the same time, the absence of Government of Ghana (GoG) capacity building support could have a negative impact on marine and freshwater stocks.

Seychelles. The tuna fishery is managed by regional bodies in concert with the Seychelles authorities. The loss of the cannery might reduce commitment to the monitoring, control and surveillance (MCS) activities essential to enforce the agreed management regimes

Uganda. Potentially reduced markets for fish could assist in the revival of fish stocks including assisting in the restoration of endangered fish species that have since disappeared from the waters.

The reduction of government support to the fishing industry would have adverse effects on resource stocks. Although the stocks are not currently properly estimated, reduction of support could hamper the determination of existing fish stocks because the costs cannot be afforded by fishermen's revenues.

4.3.4 Process impacts

European Union

There will be an increased need to adapt the EU stance in the face of significant changes to the seafood supply regime. For example, greater support will be required for fisheries-dependent areas and especially for diversification in those areas. Also, there will be a need for continued adaptation of the foreign fisheries policy – especially conservation related – to circumstances where EU bargaining power will be reduced as market forces rather than political agreements determine fisheries interactions with third countries.

Other developed countries – Japan and USA

In the USA there may well be quite noticeable outcomes induced by WTO changes some of which (as noted above) may have adverse effects on a regional or local (community) basis. The US response may well be to seek to support communities and in some cases (i.e. around the Gulf of Mexico) in the short and medium term these actions could be conflated with those in the aftermath of Hurricane Katrina.

The US may seek to retain anti dumping measures, especially in the context of further reductions in tariff levels. Whilst such measures have sometimes had perverse economic outcomes, and have also sometimes failed to stem ongoing import penetration, they may nonetheless remain politically attractive. The extent to which these measures conflict with WTO procedures and hence require resolution also has yet to be resolved.

Non-ACP/LDC developing countries

China Chinese institutions and policies have shown increasing responsiveness to trade issues and needs, especially following its acquisition of WTO membership. There is some evidence that its capacity to improve management of marine ecosystems is developing in the context of regional fishery initiatives. Ongoing expansion of trade opportunities that may arise from lowering of tariffs can be expected to further encourage these features.

India. There is currently perceived to exist a lack of coherent approaches to deal with trade measures, resulting in ad hoc measures which are costly, inefficient and counter-productive. There are inconsistencies in approaches to different trade measures which, though justifiable in a developing country context, could be a future hurdle in trade negotiations. Also, there is a poor/weakening institutional capacity to implement trade related measures and monitor their performance, and to help the poor to cope with such measures more confidently.

The price to be paid for the inability to offer a developing country perspective in standard setting processes will become apparent in due course as the domestic seafood sector struggles to come to grips with exotic and unaffordable systems. The price to be paid for too much compliance will also become clearer during the coming years as the importing countries build upon precedents to further tighten the controls on imports.

State's withdrawal from its obligation towards providing public support services, could reduce the capacity of individual fishers to cope with changes on their own. State's efforts at erecting non-tariff barriers like domestic food laws might actually hurt the local producers and traders more than the importing countries. Technology oriented approaches encourage further investment in fishing, thereby considerably reducing the economic viability of the sector, while also determining the course of action in management programmes, resulting in poor outcomes.

Peru. The Ministry of Produce-Fishery sub sector governs all aspects of marine, inland fisheries and aquaculture. Their policy remit is to provide the conditions for an open market in fishing, to monitor and control the resource and to encourage diversity within the sector in harvesting new species, developing aquaculture, and investing in processing plants to give added value to the raw material. The Ministry is responsible for the granting of permits for foreign fishing vessels to fish in Peruvian waters and monitoring their catch. Protection of the EEZ is managed through a satellite system that can monitor movement of vessels within the EEZ and detect illegal activity.

Thailand. There is a need for improved regulation of the seafood industry to ensure hygiene/quality for growing exports to match increasing OECD market requirements matched by increased demands for effective environmental & social regulation.

ACP/LDC countries

Ghana and **Uganda**. Government support to the fishery sector is a necessary ingredient towards its development; the absence of that support will adversely affect the requisite momentum it requires to achieve its goals. The uncompetitive status of Ghana's and Uganda's fish and fishery products as a result of the proposed trade liberalization has the potential to affect their commitment towards participating and implementing some regional fishery programmes. Government investment programmes in the fishery sector could be adversely affected.

Seychelles. As the premier manufacturing and exporting entity in the Seychelles, the processing industry IOT provides a substantial context for the development of both commercial management skills and their matching state administration counterpart.

Table 11: Impact Summary – Tariff Reductions

Country grouping	Description of impact	Type of countries or products affected	Factors affecting significance	*
		Economic Impacts		
European Union	Decline of processing industries	Tuna: S Europe; Shrimp, small pelagics, whitefish: N & E Europe	Loss of competitiveness due to lower labour costs in Asia	▼
	Increased imports; Lower consumer prices, and increased demand	Whitefish, shrimp, salmon: NEurope; Tuna: S&N Europe	Lower prices of products from Asia, Latin America, Russia, US; Price elasticity of demand for imported fish	△▲
Other Developed Countries: USA	Some increase of imports into US	Shrimp, salmon, whitefish, tuna	Price elasticity of demand Econ. fundamentals	△▽
Japan	Small increase of imports		Currently low tariff levels	△▽
Non-ACP/LDC Developing Countries	Large increase of exports	Tuna, shrimp, whitefish; Incl. processed products (e.g. Thailand, Philippines, Vietnam, Indonesia, Chile, Brazil)	Availability of skilled, cheap labour; favourable exchange rates Anti-dumping measures may reduce speed of change	▲
	Some imports possible	Small pelagics, salmon	Price elasticity of demand for imported fish	△
ACP/LDC Countries	Loss of markets; decline of processing industries	In particular, tuna, shrimp To a smaller degree whitefish	Preference erosion and resulting trade diversion	▼
		Social Impacts		
European Union	Reduced employment, in particular amongst women in some areas	E, S, and N Europe, (although in E Europe it is more the case of processing not taking off as expected)	Move of processing industries to Asia	▼
	Positive income effect through lower prices			△▲

Country grouping	Description of impact	Type of countries or products affected	Factors affecting significance	*
Other Developed Countries: Japan and USA	Reduced employment in some industries Positive income effect through lower prices	Mainly USA, e.g. shrimp and tuna industries, to some extent salmon and whitefish Less impact in Japan	Move of processing industries to Asia and Latin America	▽ △
Non-ACP/LDC Developing Countries	Positive in terms of employment, including for women, with knock-on effects on health and education Negative impacts where increased production displaces other livelihoods (rice farmers)	Tuna, shrimp, whitefish; Incl. processed products (e.g. Thailand, Philippines, Vietnam, Indonesia, Chile, Brazil)	Availability of skilled, cheap labour Anti-dumping measures may reduce speed of change	▲ ▼
ACP/LDC Countries	Loss of employment where processing industries decline	E.g. Tuna processing (Seychelles, to some extent Ghana); shrimp industries	Preference erosion	▼
Environmental impacts				
European Union	Capture depends on catch control; as a result imports do not necessarily mean less pressure on stocks	Whitefish, small pelagics	Effectiveness of management regime	–
Other Developed Countries: Japan and USA	Capture depends on catch control; as a result imports do not necessarily mean less pressure on stocks	Shrimp, salmon, whitefish	Effectiveness of management regime	–
Non-ACP/LDC Developing Countries	Increased pressure on the environment (e.g. mangroves forests, agricultural land) Increased pressure on fish stocks	Aquaculture production (e.g. shrimp, whitefish) Capture fisheries, e.g. tuna	Environmental regulation Effectiveness of management regime, incl. RFMOs	▼ ▽
ACP/LDC Countries	Pressure on environment likely to remain the same	For example, tuna previously destined for Seychelles cannery may now go to Thailand	Effectiveness of management regime Trade diversion (raw material)	–

Country grouping	Description of impact	Type of countries or products affected	Factors affecting significance	*
Process impacts				
European Union	Need to adapt the EU stance in the face of significant changes to the seafood supply regime	EU wide	Speed of changes; Highly heterogeneous fisheries sector across the EU	▽
Other Developed Countries: Japan and USA	Issues over US anti-dumping measures (e.g. shrimp)	US anti-dumping cases against six leading shrimp exporters	WTO decisions on anti-dumping cases	▽
Non-ACP/LDC Developing Countries	Increased requirement to analyse and deal with WTO matters and outcomes. Lack of coherent approaches to deal with trade measures Government regulation related to environmental issues, food safety/standards etc	Majority of countries		▽
ACP/LDC Countries	Lack of capacity to analyse and deal with WTO matters and outcomes Government regulation required related to environmental issues/food safety, standards etc	Majority of countries		▽

Key:

-	Non-significant compared to base situation
△	Positive minor significant impact
▽	Negative minor significant impact
▲	Positive major significant impact
▼	Negative major significant impact
△▽	Minor positive and negative impacts likely to be experienced according to context
▲▼	Major positive and negative impacts likely to be experienced according to context
△▲	Minor and major positive significant impacts to be experienced according to context

5. The Impact of the Doha Round: Fisheries Subsidies

5.1 Fisheries subsidies: an overview

The Declaration of the fourth WTO Ministerial Conference (Doha, 2001) stipulates that "In the context of these negotiations, participants shall also aim to clarify and improve WTO disciplines on fisheries subsidies, taking into account the importance of this sector to developing countries". The Declaration of the sixth WTO Ministerial Conference (Hong Kong, December 2005) further states that "We *recall* our commitment at Doha to enhancing the mutual supportiveness of trade and environment, *note* that there is broad agreement that the Group should strengthen disciplines on subsidies in the fisheries sector, including through the prohibition of certain forms of fisheries subsidies that contribute to overcapacity and over-fishing, and *call on* Participants promptly to undertake further detailed work to, *inter alia*, establish the nature and extent of those disciplines, including transparency and enforceability. Appropriate and effective special and differential treatment for developing and least-developed Members should be an integral part of the fisheries subsidies negotiations, taking into account the importance of this sector to development priorities, poverty reduction, and livelihood and food security concerns."

Several proposals from WTO members aiming to reduce fisheries subsidies have been tabled, mostly attempting to reduce or eliminate those subsidies that increase fishing capacity (Lem, 2004a). At the same time, there is considerable debate as to what fisheries subsidies actually are and what they include which complicates any discussion of their implications for markets, resources and livelihoods.

According to Article 1 of the WTO Agreement on Subsidies and Countervailing Measures (SCM) subsidies include:

- Financial contributions by a government or any public body within the territory of a Member where:
    i. a government practice involves a direct transfer of funds (e.g. grants, loans, and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees);
    ii. government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits);
    iii. a government provides goods or services other than general infrastructure, or purchases goods;
    iv. a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments; or
- Any form of income or price support in the sense of Article XVI of GATT 1994; and benefits thereby conferred.

Westlund (2003) defines fisheries subsidies as "government actions or inactions that are specific to the fisheries industry and that modify – by increasing or decreasing – the potential profits by the industry in the short-, medium- or long-term".

UNEP (2004) distinguish between eight different types of fisheries subsidies, namely:

- "Subsidies to fishing infrastructure (e.g. construction of port-facilities);
- Management services (e.g. monitoring and surveillance, management related research);
- Subsidies to securing fishing access (e.g. government-to-government payments that cover significant portions of the cost of access to foreign fishing grounds);
- Subsidies to decommissioning of vessels (e.g. vessel or license retirement);
- Subsidies to capital costs (e.g. grants, loan guarantees, or tax incentives encouraging fleet removal or modernisation);
- Subsidies to variable costs (e.g. subsidies on fuel, bait, insurance, or other operating costs);
- Income supports (e.g. special unemployment insurance or "lay-up" payments); and
- Price supports (e.g. government market interventions to guarantee a minimum price on fish products)".

This study adhered as much as possible to this categorization of subsidies, although, due to lack of data and information, it proved difficult to cover all of them to the same extent.

Subsidies are categorised in relation to the rights of members to make complaint and take action (countervailing measures):

Prohibited: export enhancing subsidies or subsidies giving preference to domestic producers or grants tied to the use of domestically produced goods.

Actionable: a subsidy that may be challenged on the basis of causing 'adverse effects' to the interests of other WTO members.

Most of the literature on subsidies in fisheries focuses on marine capture fisheries rather than aquaculture. The bulk of subsidies are aimed at offshore fisheries which are largely commercial requiring mechanised ocean-going vessels rather than coastal or inshore fisheries that are largely artisanal or semi-industrial in nature. Some of these subsidies have implications for developing country fisheries and livelihoods of poor people.

Subsidies are seen as a driving force in creating the overcapacity in the fishing industry which has led to overfishing. According to Milazzo (1998), annual aggregate subsidies to the fisheries sector were of the order of US$14 billion to US$20 billion (quoted in World Bank, 2004). WWF (2005) estimates that fisheries subsidies amount to at least US$15 billion per annum.

According to Cox (2006) OECD government financial transfers (GFTs) were of the order of US$6.7 billion in 2003, which corresponds to 21% of the value of landings. The GFTs were used as outlined in Table 12, with the biggest amounts going to management, research, and enforcement (38%), and infrastructure (34%).

Table: 12 OECD GFTs to fisheries by programme objective, 2003

Programme objective	Percentage
Management, research and enforcement	38
Infrastructure	34
Access agreements	3
Decommissioning schemes	8
Vessel construction and modernisation	4
Income support	6
Other	7

Source: Cox, 2006

OECD (2003) assumes that subsidies to the processing sector are limited. Support to the processing sector is primarily due to tariffs on processed products (i.e. market price support that is not financed by the governments but by higher prices for consumers, which were estimated to be of the order of US$ 400 million in 2000).

Some distant water fishing states have fisheries access agreements with coastal states that involve the granting of fishing rights conditional on financial payments. According to UNEP (2004) "Such payments to foreign countries, which may cover a significant part of the effective cost of a distant water fleet's access to foreign fishery, have the effect of subsidising the foreign fleet in question." According to World Bank (2004), many fishing agreements are heavily financed by industrial countries (e.g. the EU paid 83% of the license fee, the vessel owners themselves only 17%). However, distant water fishing states may subsidise the cost of fishing access without such an explicit provision in an access agreement (e.g. US Government grants to Pacific Island countries pay a significant share of the access to tuna fisheries by the US tuna seiner fleet).

Difficulties related to the assessment of subsidies are related to the lack of notification by WTO members, and the fact that some subsidies are "un-budgeted" (e.g. tax concessions). Transparency regarding subsidies is an issue in that few members of the WTO have complied with their obligation to report subsidies. The political sensitivity of the subsidies issue is highlighted by the use of euphemisms for subsidy: e.g. 'government financial transfers' and 'economic incentives'. There are also large inconsistencies in the data that are publicly available. Overall, however, the EU appears to have a good record as far as transparency and fisheries related notifications are concerned. This is illustrated in Table 13 which shows the number of WTO notifications regarding fisheries between 1995 and 2001.

Table 13: Number of WTO notifications regarding fisheries, January 1995 – April 2001

Country	Harvesting sector	Shipbuilding	Processing	Other	Total by country
Canada	4				4
Japan	6			1	7
Korea	6	2	2	1	11
Norway	16	1	1	4	22
Philippines	1				1
Poland	3				3
Senegal	1				1
Slovakia	1				1
USA	5				5
EU	75	9	9	34	127
Iceland	1		1	3	5
Tunisia				1	1
Singapore	1				1
Turkey	1				1
Thailand				1	1
Total notifications	121	12	13	45	191

Source: WTO, quoted in OECD (2003)

5.2 Impact of fisheries subsidies

Most discussions of subsidies largely focus on the fisheries sectors in developed or middle-income countries. This is due both to their scale and the ease of access to data. Moreover, MRAG (2000) argues that subsidies on deep water fleets from developed countries “are likely to have a much greater impact”.

UNEP (2004) describes the dual impacts of fisheries subsidies on trade and the environment, whilst WWF (2005) states that “once a hidden problem, inappropriate subsidies are now widely recognized as contributing to the profound crisis of over fishing that threatens fish stocks and human welfare around the world”.

A key theme of a study by MRAG (2000) is the interaction between context and subsidy. The study argues that bilateral access agreements are the kind of subsidy that have most impact on developing country coastal and island states. The study summarises both the negative and positive impacts from the access agreements organised under three headings: biomass and stocks; economic and social. These impacts are very context-specific and vary considerably in magnitude and are difficult to isolate from other factors affecting the sector. The role played by good fisheries management systems was highlighted in the case studies.

For a variety of reasons, quantitative modelling of subsidies is extremely difficult. OECD (2003) presents a qualitative economic model which considers the effects of giving government financial transfers (GFT) to fisheries and suggests that in the main where there is catch control or preferably effective fisheries management, government financial transfers have no effect on the total catch or the price of fish.

Table 14 provides an overview of the effects of giving GFTs to the fisheries sector. In particular, it demonstrates the importance of having an effective fisheries management or catch control in the fish exporting country in place. In a scenario where there is open access or an ineffective management system in place, the result of GFTs is likely to lead to catch increases and lower prices in the short run; however the long-term effect will be lower catches and higher prices if the stock is exploited beyond the maximum sustainable yield (OECD, 2003).

The negative impacts of subsidies are least if there is an effective fisheries management system in place. If there is a catch control system in place, then subsidies will not affect total catch or the price of fish, however there will be more resources attracted to the fisheries sector (i.e. leading to increased fishing costs) which will have repercussions on the rest of the economy in that less will be produced of other goods (OECD, ibid).

Table 14: Effects of giving governmental financial transfers to the fisheries

	Open access	**Catch control**	**Effective management**
Total catch	Increases in the short run but decreases in the long run if the stock is exploited beyond maximum sustainable yield	Unaffected	Unaffected
Price of fish	Falls in the short run but rises in the long-run if the catch falls	Unaffected	Unaffected
Long-term profitability of industry	Unaffected "at the margin" but profits will rise for fishermen who are more effective or have lower opportunity costs	Same as for open access	Increases
Long-term effects on trade	Uncertain, depends on what happens to total catch	Small, but there might be repercussions for goods other than fish	None
Effects on the rest of the economy	More capital and manpower is attracted to the fisheries and less will be produced of other products	Same as open access	None

Source: Hannesson (2001), quoted in OECD (2003)

Taking the OECD approach a step further, UNEP (2004) investigates the impacts of the aforementioned eight types of subsidy using a matrix which is based on two key variables, i.e. the level of fleet capacity (expressed as “overcapacity”, “full capacity”, and “less than full capacity”), and type of management regime (categorised as “open access”, “catch control” and “effective management”).

Some of the findings of UNEP (2004) include, “subsidies to capital costs are expected to be harmful in all circumstances unless the fisheries management system provides for property rights, community-based management, or other means for eliminating economic incentives to overfish. They can be harmful even in fisheries that are less than fully exploited where subsidies to capital costs encourage the adoption of much more powerful fishing technologies, potentially causing an overshoot in fleet capacity well beyond a biologically sustainable level. Only under the extremely rare ideal circumstances of an effective management regime, could such subsidies be benign. ….. Subsidies for access to foreign countries’ waters could theoretically be beneficial in the presence of effective management. However, such subsidies are expected to be harmful to fisheries resources, unless the fisheries covered by the agreement are clearly undercapitalized. Unfortunately, bilateral access agreements in the real world have almost universally involved host country fisheries in which capacity or exploitation levels are already high, and/or in which management controls are absent or weak”.

5.3 WTO Negotiations and fisheries subsidies

As part of the WTO negotiations, the EU position lies between the “top-down approach” of the Friends of Fish group (e.g. New Zealand, Chile, Peru, and USA) and the “bottom-up approach” by countries such as Japan, Korea, and Taiwan. The EU approach is based on boxes (i.e. red and green) whereby subsidies contributing to overcapacity are prohibited (e.g. subsidies for vessel construction or renovation). On the other hand, capacity decreasing subsidies and support for the development of alternative income sources in affected fishing communities are acceptable. Significantly, the EU is also advocating more transparency and effective enforcement mechanisms. Some of the suggested subsidy reducing measures are already being implemented as a result of the EU’s reformed Common Fisheries Policy (CFP).

5.3.1 Elements of the main negotiating positions [4]

(a) “***Top-down approach***” by “Friends of the Fish” (FoF): Chile, Colombia, Ecuador, Iceland, New Zealand, Peru and USA, plus Brazil and Pakistan argues that there should be new disciplines on fisheries because fisheries subsidies can distort access to productive resources and because of the heterogeneous nature of fisheries products, and economic structure of industry, existing SCM rules are difficult to apply.

[4] Largely based on ICTSD summary table of “Selected WTO Members’ Positions on Fisheries Subsidies” of 10 March 2006.

Approach: Prohibitions of all fisheries subsidies apart from certain exemptions; i.e. top-down: start with a prohibition on all subsidies that benefit the fishing industry and then identify and define the exceptions to the prohibition.

Red light: Subsidies that benefit the fishing industry. Positions vary amongst FoF members. For example, US position: those fishing subsidies that directly promote overcapacity and overfishing, or have other trade distorting effects. New Zealand position: Subsidies within the meaning of Art 1 of the ASCM that confer a benefit directly or indirectly on any natural or legal person engaged in the harvesting, processing, transport, marketing or sale of the fish and fisheries products listed in Annex IX of this Agreement ("fisheries subsidies") (GEN/100).

Amber light: US position - subsidies presumed to be harmful unless the subsidizing government could affirmatively demonstrate that no overcapacity, overfishing or other adverse effects result, modeled on Art 6.1 of SCM agreement.

Green light: Government expenditure for management frameworks, general infrastructure and access; certain fisheries related social insurance programmes; appropriately structured decommissioning subsidies (positions vary amongst "Friends of Fish" members).

(b) ***Bottom up approach*** - Japan, Korea, and Taiwan (Chinese Taipei): Only prohibition of those subsidies that are explicitly listed.

Red light (examples): Subsidies which encourage IUU fishing and fishing vessel construction engaged in poorly managed fisheries; subsidies for fishing vessel modification resulting in capacity enhancement; for shipbuilding yards for fishing vessels; subsidies for overseas transfers of fishing vessels to non-contracting parties of regional fisheries management organizations (RFMOs).

Green light: Subsidies which promote the conservation and sustainable utilization of fisheries resources; structural adjustment and regional development assistance which do not cause deterioration of natural resources; infrastructure; fishing vessel decommissioning; retraining of fishermen and early retirement schemes.

Small vulnerable coastal states (SVCS) and the ACP countries prefer a bottom-up approach to fish subsidy disciplines. (ICTSD Bridges Trade BioRes Vol 6 Nr 3, 17 Feb. 2006.

(c) ***European Union – Middle ground*** (based on submission TN/RL/GEN/134 of 24 April 2006)

The following subsidies shall be prohibited:

- Subsidies for the construction of new fishing vessels,

- Subsidies for the renovation of existing vessels, and
- Subsidies for the permanent transfer of fishing vessels to other countries including through the creation of joint ventures with partners of those countries.

The following subsidies are permitted:

- Subsidies contingent upon a reduction in fishing capacity or that are provided for the specific purpose of mitigating the negative social and economic consequences of reductions in capacity;
- Subject to a non increase in capacity, subsidies that are granted in the context of conservation measures, for product development, for modernisation of vessels including improved working conditions and safety on board, and subsidies that promote more environmentally friendly fishing operations.

Interpretation of the negotiating positions:

"A main difference between the approaches appears to be related to burden of proof and transparency. The top-down approach would probably require those providing the subsidies to justify them, while the bottom-up approach would likely put the onus on those who think that a subsidy is detrimental to proof it. The top-down approach might also lead to greater transparency (or at least so the proponents argue) if it included a requirement that all subsidies that are allowed would need to be notified. From a fisheries management perspective, that would be very useful information to have. In any case, the final approach is likely to be a mix, either as proposed by the EU or by applying conditions to certain green box subsidies (thereby effectively making them actionable) as proposed by Brazil" (personal communication: Heike Baumuller, ICTSD).

The EU proposal also includes stringent notification requirements which are expected to ensure transparency throughout the process of implementation of subsidy programmes by WTO Members. Nevertheless, the top-down approach seems to be the most far-reaching in terms of its potential impact. The outcomes of the other two proposals are less clear. The bottom-up and EU proposals do not seem to take into account the issue of variable or operational costs (e.g. indirect subsidies for fuel); there seems to be a focus on the abolition of subsidies for the construction or renovation of fisheries vessels that might result in capacity enhancement. However, the overcapacity has already been created and might continue to exist for a while given the life of fishing vessels (personal communication: Stephen Mbithi Mwikya). Although decommissioning subsidies would be permitted, related schemes have not always been successful.

As a consequence, new subsidies disciplines that will most probably be based on a negotiated compromise are unlikely to bite in the short-term, but rather in the longer-term once the fishing fleets of the countries concerned come towards the end of their useful life.

Subsidies for research, fisheries management, and MCS measures appear to be accepted by all three negotiating positions. Although it was expected that developing countries are unlikely to be affected from new disciplines on fisheries subsidies as a result of Special and Differential Treatment (SDT), the situation is less clear following recent proposals by Argentina and Brazil.

As already highlighted, the issue of government financial support to fisheries access agreements is a contentious one. Although many observers and analysts agree that they constitute a form of subsidy there tends to be less agreement on the extent to which they include "good" and "bad" elements of subsidy.

The contributions of European vessel owners as part of Fisheries Partnership Agreements (FPAs) are slowly being increased. For example, a contribution to licence fees of €35 per tonne of tuna (contrary to €25 in previous agreements) is to be paid by vessel owners and the remainder by the EU[5]. It can be expected that in the long-term the fishing industry's contributions will continue to increase and may ultimately affect operational costs to such an extent that fishing efforts will be reduced. Also, FPAs are planned to be more transparent than previous access agreements, and place more emphasis on adequate monitoring, control and surveillance (MCS) measures.

5.4 Assessment of impacts - fisheries subsidies reductions

5.4.1 Economic impacts

European Union

The subsidy issue within the EU is confused since much of what could be construed as being a subsidy to the fisheries sector is confounded with wider socio-economic support for relatively poor areas in the EU. Although the quantum of the main funding instrument (i.e. the Financial Instrument for Fisheries Guidance - FIFG) is quite large in relation to first-sale value of Community fish landings, the subsidising effect may be relatively small. This is because much of the support is for investments in infrastructure that would arguably normally be state responsibilities, or for measures like vessel decommissioning that may add to the general good, but only indirectly reduce fishermen's costs.

There are also aspects where subsidies are clearly involved such as one-off grants for investments in vessel or processing plant efficiency improvements. The rescue and restructuring aid to help the industry deal with emergencies would be another case in point. Loss of this support is likely to damage the viability of the EU fisheries sector. Price support measures exist, as does support for withdrawing fish from the market when prices fall below preset minima, but the market impact of these mechanisms is negligible.

As already indicated, Fisheries Partnership Agreements (FPAs) arguably subsidise EU fleets by underwriting license fees. Their abandonment would increase the EU fleets

5. Usually, the total amount of license fee is €100 per tonne of tuna caught.

costs, but would also reduce funds targeted on resource management in the recipient developing countries and so have potentially negative environmental effects.

At the same time, it can be argued that money freed up as a result of subsidy reductions could be put to use elsewhere in the economy (e.g. reinforce research and innovation).

Other developed countries – Japan and the USA

US subsidies include components for its distant waters tuna fleet, where fishery access is effectively subsidised by aid funded payments (e.g. US Agreement with the Pacific Forum Agency). The fleet has already substantially diminished and now represents more specialist vessels. If the subsidy element were to be eliminated there could be a potential threat of further reduction in economic activity. The distant water fleet of Japan operates in a somewhat similar fashion to that of the USA but the exact mechanisms e.g. of licensing, are negotiated at company level and are therefore quite opaque. These operations are ostensibly de-coupled from any aid activity, although it has been argued that the Japanese Government does finance infrastructure works which are carried out simultaneously with the implementation of fisheries agreements concluded by Japanese fishermen's associations.

Overall any cuts in subsidies in either country might induce a reduction in tuna fishing effort – the issue then would be the extent to which this is replaced by either local fishing fleets of the activities of other distant water vessels.

Non ACP/LDC developing countries

China. Subsidies are particularly important in the aquaculture sector and were these to be removed there could be significant economic impacts. Since the sector has relatively low productivity levels removal of subsidies could slow the process of intensification. Given the scale of the sector and its importance in rural livelihoods, coupled to its contribution to (often rural) protein consumption levels, it appears unlikely that China's government would be willing to forgo subsides if it felt these were effective in promoting productivity.

In the capture fishery sector government subsidies have been used recently in an effort to downsize the fleet with consequent economic impacts. The intention is to progressively eliminate 30,000 fishing boats by 2010 and to relocate 300,000 fishers. In all it is estimated that around one million households will be affected. It is possible that subsidies for downsizing might form part a future WTO agreement, but the complexity of the subject may mean that agreement is difficult to reach. As in the case of support to aquaculture, it is difficult to envisage government changing policies that seek to assist often small scale fishers to find alternative livelihoods. Downsizing coupled to improved management could also ultimately help to restore a more substantial demersal fishery with associated economic benefits.

India. In economic terms, the withdrawal of subsidies would affect the processing and exporting industries and reduce the capacity of the smaller processing companies to upgrade to the HACCP standards. In another sense, this might be a good thing in so far as it takes the attention away from shrimp and towards other species. The reduction in other direct subsidies is unlikely to affect the sector adversely and, going by the current status of the debate on fisheries subsidies, might actually encourage the government to increase its spending on fisheries subsidies, mainly in the form of new boats and technologies. Given that the sector has already been facing problems of over-capacity, the new introductions would only add to the problems. There might be some employment generation, but it will be too small to merit attention. The further reduction of indirect subsidies for petroleum products and electricity could have serious implications for the viability of both production and trade of seafood and could lead to large-scale unemployment, falling incomes and overall capital erosion (in the form of non-performing assets). Increased application of 'user pays' principles would also reduce access to poorer stakeholders to natural and physical resources, which is necessary for their livelihoods.

Peru. Ministry officials confirmed that there are no subsidies to the industrial fishing industry, either by way of direct financial assistance or by exemption from any taxes or duties payable. One subsidy which could be identified was the free use by the artisanal fishermen of government port terminals to land fish, although they are obliged to pay for all other service charges at the terminal.

The Ministry of Economy is looking at the possibility of an exemption of the Selective Consumer Tax (ISC) on fuel oil for national and foreign vessels landing tuna for canning. This is to encourage the recovery of the tuna canning industry and the expansion of the frozen fish exports.

There is a law exempting inland aquaculture enterprises from certain government licence fees and a granting a reduced income tax rate of 10% on net profits, restricted to certain departments, in order to stimulate investment in fish farming in these areas.

There are currently no government credit systems providing either the industry or the artisanal fishermen with finance at interest rates more favorable than those charged by the commercial banks.

Thailand. Direct subsidies within the Thai fisheries sector are probably not significant contributors to the sector's economic performance. First, the ability of the state to fund the sector in this manner is limited. Second, Thailand has a free market approach, which makes it generally unwilling to interfere in the commercial arena. The Thai Government does play a role in directing and promoting the development of the sector, especially novel activities and commits "seed corn" finance (arguably subsidies)– as it has done to promote distant water fishing for tuna. However on-going financial support to viable enterprises – or to keep unviable segments in business - is believed to be minimal.

There are government activities that arguably provide some level of indirect subsidy, especially to aquaculture. If it is assumed that overall management of the sector is deemed to be a legitimate state function (as it is in most but not all fishing nations) then there are two areas that could be seen as crossing the border into subsidy, i.e. applied research on aquaculture, rural support to artisanal fishing and fish farming communities.

Overall, the impact of subsidy on the Thai seafood sector is believed to be currently limited, though research has clearly generated benefits in the past. However, it is possible there could be a converse indirect benefit as, were there to be a general global abandonment of direct subsidies throughout the sector, this could enhance Thailand's competitive position.

ACP/LDC countries

Although it is often argued that fisheries subsidies in ACP/LDC countries are small or negligible, abandoning subsidies on inputs such as fuel, ice supplies or loans (i.e. credit on preferential terms) would have a negative impact on incomes of small-scale and semi-industrial fishermen.

Ghana. Substantial amounts of tax exempt fuel have been supplied to the small-scale / artisanal fisheries sector in Ghana (i.e. corresponding to a subsidy worth US$35.3 million between 2001 and 2004). Given that landings by the artisanal sector are estimated to contribute 69% of Ghana's total marine fish output, subsidy reductions would have substantial knock-on effects on production and ultimately income.

Seychelles. Fisheries Partnership Agreements (FPAs) arguably represent subsidies to the EU fleet and the Government of Seychelles in that license fees as part of FPAs have come to exceed those from other vessels by a wide margin. Thus if this arrangement were to be abandoned or reduced, the government revenues would be significantly reduced. Also, abandoning direct subsidies on fuel and loans would have an impact on incomes of the artisanal fishery, possibly reducing this by 5 – 10%.

As for ***Uganda***, it is estimated that subsidies to support small-scale fishers have a negligible distorting impact on the international fish trade although their removal could cause increased hardship. Removal of the subsidies supporting processing operations (i.e. primarily duty exemptions on imported inputs) would reduce their ability to compete.

5.4.2 Social impacts

European Union

Subsidy reductions have already started as part of the reformed Common Fisheries Policy (CFP). In particular, capacity enhancing subsidies are being cut which is in line with a possible Doha Round outcome. As a result, it can be expected that some of the less efficient fisheries are likely to be pushed out of the fisheries sector either into redundancy or into alternative livelihoods.

The fact that mitigating measures such as retraining and creation of alternative income generating activities will be supported also in the context of the soon to be launched European Fisheries Fund represents a flanking measure that will also be highlighted in the section on flanking measures.

Other developed countries – Japan and the USA

Domestic impacts of both US and Japanese subsidies may not be substantial in social terms, e.g. in comparison to impacts that could arise from tariff changes. Further contraction in the US and Japanese tuna fleets could arise with consequent implications for unemployment. In the case of Japan the degree of impact will also depend on the extent to which the country modifies its current stance which seeks essentially to retain subsidies.

Non ACP/LDC developing countries

China. As indicated under economic impacts, the importance of support to the aquaculture sector may be such that government is unwilling to substantially reduce current support programmes in the face of possible WTO changes that reflect the "friends of fish" end of the spectrum. The inland aquaculture sector is primarily formed of small scale enterprises and represents an important component of rural livelihoods. Currently government concern is focussed upon measures that might redress emerging rural urban imbalances (as many urban areas especially in coastal regions have rapidly grown in wealth whilst rural areas have remained sluggish). The widespread rural distribution of an important protein source (fresh or live fish) is also an important factor.

In the catch sector the social consequences of downsizing of the fleet and of fishing activity are substantial and it is again difficult to envisage that subsidies to alleviate such issues would be cut. Given the nature of these subsidies the degree of pressure for their removal may in any event be less acute.

India. In social terms, any changes in the welfare subsidies would have serious implications upon the life and livelihoods of the fishers. As some of the trade related changes – the SPS measures, for instance – have the potential to marginalise sections of the supply chain participants, the role of such subsidies becomes even more important as social security nets, and if anything, there is a need to strengthen them further. However, with the evidence showing a move towards the opposite direction, it is possible that the removal of these subsidies would prove to be very expensive for a vast number of poor people in the fisheries sector. At the same time, India makes a strong case for special treatment of small-scale, artisanal fisheries in any new disciplines as highlighted in her submission to the Negotiating Group on Rules (TN/RL/W/203, March 2006).

ACP/LDC countries

Abandoning subsidies on fuel and loans would have an impact on incomes of small-scale and semi-industrial fishermen with repercussions on social indicators such as health and education. Negative impacts could be envisaged if support (e.g. skill training of women fish processors) would be reduced, although this is unlikely to happen as a result of special and differential treatment.

5.4.3 Environmental impacts

European Union

Subsidy reductions targeting the capacity enhancing measures are likely to have an impact in the medium to long-term when the current generation of fishing fleet will reach its useful life. In the short-term much will depend on the availability of indirect support which may have an impact on operational costs.

Other developed countries – Japan and the USA

For the USA and perhaps also for Japan, removal of subsidies may be important especially for distant water tuna fleets. Changes in the level and manner of implementation of subsidies may well have important effects on the management and sustainability of the sub sector, e.g. the extent to which existing fleets are replaced either by local or other long distance vessels and the nature and effectiveness of the regulatory system adopted. In the USA, a reduction of "non-budgeted" subsidies (e.g. linked to fuel or capital costs) could be expected to result in beneficial environmental impacts.

Non ACP/LDC developing countries

China. Environmental impacts could be important in the aquaculture sector since current subsidies encouraging intensification have the potential to generate problems unless appropriate management systems are also developed and implemented effectively. The issue may be particularly important given the major degradation of inland waters that already exists in much of China. Overall a key issue is therefore the extent to which subsidised activity incorporates the development of effective management regimes.

On the catch side, subsidised changes are focussed on measures that have the potential to restore ecosystems that have been damaged by over fishing. The regional initiative covering a range of marine environments has led to the identification of a variety of differing management zones and provisions for varying levels of fishing effort, allowable species composition etc.

India. In environmental terms, the reduction in some direct subsidies - as in the case of exemption of sales tax on HSD oil – will reduce the trawling activity in the near-shore waters and improve the health of the natural resources. The reduction in oil subsidies –

both direct and indirect – to the motorised sector also would have positive consequences for environmental health as they are often equally guilty as the trawlers of indulging in destructive fishing and, more importantly, in over-fishing. Weakening of capital intensive systems is likely to help diversify from shrimp and other commercial species, which is likely to improve the ecosystem balance. At the same time, the proposal to introduce new vessels and technologies for improving the stagnating catch situation is likely to aggravate the problems.

ACP/LDC countries

In view of Special and Differential Treatment, ACP and LDC countries are unlikely to be affected by new WTO subsidy disciplines. The following summarises the views expressed by stakeholders in the countries concerned.

Ghana. The absence of Government of Ghana (GoG) capacity building support could have a negative impact on marine and freshwater stocks. According to local observers, the removal of subsidies by developed countries presents a good opportunity for sustainable fisheries resource management in Ghana’s Exclusive Economic Zone (EEZ). A reduction in the pressure on the fishery resources in Ghana’s EEZ, as a result of removal of subsidies to foreign fleets to fish outside their territorial waters, is expected to help replenish fish stocks.

Although a reduction of effort enhancing subsidies (e.g. on fuel) for the artisanal / semi-industrial sector may not be envisaged, it may be worthwhile considering, especially in areas where overfishing has become a serious problem (Gulf of Guinea). Although part of the fishing population is likely to suffer, there may be long-term benefits in the form of more healthy fish stocks.

Seychelles. The tuna fishery is managed by regional bodies in concert with the Seychelles authorities. The loss of the cannery might reduce commitment to the monitoring, control and surveillance (MCS) activities essential to enforce the agreed management regimes. The potential scaling down of FPAs in the longer-term might reduce the capacity of the Government of Seychelles to continue MCS.

Uganda. The reduction of government support to the fishing industry would have adverse effects on resource stocks. Although the stocks are not currently properly estimated, reduction of support could hamper the determination of existing fish stocks because the costs cannot be afforded by fishermen’s levies.

5.4.4 Process impacts

European Union

Process impacts could include the need to modify current policies supporting the fisheries sector that are deemed to be (unacceptable) subsidies and/or protection. These could include parts of the FIFG, FPAs, and the imposition of minimum import pricing. The subsidy area in particular is both complex and currently subject to quite widely diverging views amongst WTO members. The extent and rate of any changes and their exact formulation is therefore difficult to predict. As such the need for any change within the EU may not be very substantial or short term.

Issues such as improved transparency already form part of the reformed Common Fisheries Policy (CFP). This is also reflected in the new Fisheries Partnership Agreements which contain specific capacity building measures related to control, monitoring, and surveillance (CMS).

Other developed countries – Japan and the USA

The USA has taken a relatively high profile stance in WTO debates over subsidies and is likely to retain an ongoing interest, broadly within the "friends of fish" group. Nonetheless subsidized areas remain within US fishery activity that might be affected by WTO changes.

In Japan expected WTO impacts are quite limited, but there may well be ongoing issues to be resolved with respect to subsidies supplied to the sector. In terms of subsidy debates the country has taken up a stance that is at the opposite end of the spectrum to that of the USA, although most recently it has marginally softened its stance. Given the complexity of the subsidy debate and the relatively entrenched position adopted, it is difficult to envisage an outcome that will suite Japanese current interests.

Non ACP/LDC developing countries

China has initiated a stance seeking to represent developing country interests with respect to debates over subsidies, i.e. that these countries have special requirements, implying retention at least in part of the spectrum of subsidies that can be applied. The longer term outcomes with respect to its subsidy policy for fisheries are uncertain and in some key sectors, notably aquaculture China retains a strong supportive/interventionist stance with regard e.g. to inputs, services and research.

India. In process terms, the Indian government's taking advantage of a loophole in the subsidy debate to promote subsidies for investments into harvesting sector remains a cause for concern, from the economic, social and environmental perspectives. At the same time, as a result of the economic liberalisation taking place in the country, the removal of important subsidies – for e.g., those for enhancing access to cheaper credit to the poor and for ensuring their social security etc – is likely to continue and become even more stringent, with serious consequences for the poor.

ACP/LDC countries

Capacity and transparency are widely variable in ACP/LDC countries. Support reductions would likely result in negative impacts. However, support reductions are unlikely to take place as a consequence of Special and Differential treatment.

Table 15: Impact Summary – Subsidy Reductions

Country grouping	Description of impact	Type of countries or products affected	Factors affecting significance	*
Economic Impacts				
European Union	Reduced income for fisheries industries, although some of the measures are already in place as a result of reformed CFP 'Redistribution' of subsidies (e.g. from capacity increasing subsidies to decommissioning) Subsidy reductions will be beneficial to the EC budget	EU wide	Definition of prohibited subsidies Scale of subsidy reductions and budgetary constraints	▽▼ △▽ △
Other Developed Countries: Japan and USA	Some reduction of economic activity	Japan, USA	Definition of prohibited subsidies	▽▼
Non-ACP/LDC Developing Countries	Reduction of economic activity but large variations regarding amounts of subsidy	China and India likely to be more affected; Countries such as Thailand and Peru have few subsidies	Extent of Special and Differential Treatment; Definition of prohibited subsidies	▽▼
ACP/LDC Countries	Small-scale / semi-industrial sector would be affected by reduction of tax exempt inputs (e.g. fuel) and projects (e.g. infrastructure, skill training); Processing industries could be affected by reduction of duty-free inputs Negative impact on government revenue if FPAs were abandoned or down-scaled	e.g. Ghana, and other West African countries; Uganda e.g. Seychelles, Pacific Island states	Extent of Special and Differential Treatment Definition of prohibited subsidies	▽▼

Country grouping	Description of impact	Type of countries or products affected	Factors affecting significance	*
Social Impacts				
European Union	Reduced employment would lead to knock-on effects on social issues	EU wide	Scale of increase of unemployment	▽▼
Other Developed Countries: Japan and USA	Reduced employment would lead to knock-on effects on social issues	Japan, USA	Scale of increase of unemployment	▽▼
Non-ACP/LDC Developing Countries	Reduced employment would lead to knock-on effects on social issues Reduction of social programmes (e.g. India) is unlikely as a result of DDA	China and India likely to be more affected; Countries such as Thailand and Peru have few subsidies	Scale of increase of unemployment	▽▼
ACP/LDC Countries	Reduced employment in small-scale / semi-industrial sector would lead to social knock-on effects Reduced government revenue might affect social aspects (health, education)	e.g. Ghana Uganda e.g. Seychelles, Pacific Island states	Extent of small-scale fisheries Degree of dependency on access agreements	▽▼
Environmental impacts				
European Union	Impact in the medium to long-term when the current generation of fishing fleet will reach its useful life.	EU wide	Focus on reduction of capacity enhancing subsidies Extent and success of further decommissioning programmes	△▲
Other Developed Countries: Japan and USA	Impact in the medium to long-term Possibly impact in the shorter-term depending on extent to which unreported	Japan USA	Focus on reduction of capacity enhancing subsidies Definition of prohibited subsidies;	△

Country grouping	Description of impact	Type of countries or products affected	Factors affecting significance	*
	subsidies will be reduced			
Non-ACP/LDC Developing Countries	Positive impact on environment if cost reducing subsidies were removed	China: e.g. aquaculture India, e.g. tax reduced fuel for capture fisheries	Definition of prohibited subsidies, including treatment of aquaculture	△
ACP/LDC Countries	Positive impact on environment if capture cost reducing subsidies were removed Negative impact if subsidies for monitoring, control and surveillance measures were reduced	e.g. Ghana e.g. Seychelles, Ghana, Uganda	Extent of Special and Differential Treatment Definition of prohibited subsidies	△▲ ▽▼
Process impacts				
European Union	Increased transparency	EU wide	Requirements will ultimately depend on approach agreed	▲
Other Developed Countries:	Increased transparency	Japan, USA, New Zealand, etc.	Requirements will ultimately depend on approach agreed	▲
Non-ACP/LDC Developing Countries	Increased transparency Advocate SDT	e.g. India;	Requirements will ultimately depend on approach agreed	▲
ACP/LDC Countries	Increased transparency Advocate SDT	e.g. Uganda, Ghana, Seychelles	Requirements will ultimately depend on approach agreed	▲

Key:

-	Non-significant compared to base situation
△	Positive minor significant impact
▽	Negative minor significant impact
▲	Positive major significant impact
▼	Negative major significant impact
△▽	Minor positive and negative impacts likely to be experienced according to context
▲▼	Major positive and negative impacts likely to be experienced according to context
△▲	Minor and major positive significant impacts to be experienced according to context
▽▼	Minor and major negative significant impacts to be experienced according to context

6. The Potential Impact of the Doha Round: Other Trade Issues

6.1 Market access – non-tariff barriers

Although it is likely that there will be little progress in this area as part of the NAMA negotiations, there has been substantial work undertaken by WTO Members notifying non-tariff barriers (NTBs) they face in importing countries. For example, according to Friends of the Earth International, the following countries have submitted notifications on NTBs related to fish and fishery products: Argentina, Egypt, Korea, Norway, Venezuela: (TN/MA/W/46 and TN/MA/W/46/Add.10, TN/MA/W/46/Add.11, TN/MA/W/46/Add.3). At the same time, the EU is now proposing a fast-track mechanism to reduce the risk of future NTBs and to facilitate their resolution (personal communication: Charly Poppe, Friends of the Earth Europe).

Given that it was difficult to predict the outcome of WTO negotiations related to non-tariff barriers, and in view of little progress when the country case studies were launched (i.e. January 2006), the latter focused on ex-post evaluations, primarily related to SPS and TBT measures during the last decade. Nevertheless, it ought to be mentioned that some trade observers consider non-tariff barriers as the main stumbling block to increased fisheries exports from developing countries to developed countries.

6.1.1 SPS Agreement

The Uruguay Round Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) and the Agreement on Technical Barriers to Trade (TBT) adopted by WTO Members in 1995 have given a new direction to the international food trade. These agreements are intended to ensure that requirements such as quality, labelling and methods of analysis applied to internationally traded goods are not misleading to the consumer or discriminate in favour of domestic producers or goods of different origin (Bostock et al. 2004).

The SPS Agreement was set up to avoid sanitary standards being used as an unjustified barrier to trade by importing countries. There are several key principles including the sovereign right of a country to put protective measures in place, but these measures should not be more restrictive than necessary to achieve the appropriate level of protection. The Agreement stresses that SPS measures should be scientifically based as well as the importance of risk assessment in determining the appropriate levels of SPS measures. Of crucial importance are transparency in the development and implementation of measures and the adoption of international standards. The SPS Agreement gives status and legal force to the standards set by the Codex Alimentarius Commission. The Codex Alimentarius – or food code - was created in 1963 by FAO and WHO to develop food standards and guidelines and has become a global reference point for consumers, food producers and processors, national food control agencies and the international food trade.

The SPS Agreement applies only to measures covering food safety, animal and plant life and human health. Other technical measures outside this area come within the scope of the TBT Agreement. The SPS and TBT Agreements are thus complementary and mutually reinforcing.

The EU has been at the forefront in developing food safety standards and has had a profound influence on the development of the seafood export industry in developing economies. EU standards are enforced and regulated at the country level and thus a restriction of exports to the EU under the regulations affects all members of the export community.

EU legislation for all food products has recently been brought under one directive and the scope has been extended to all aspects of the supply chain from "farm to fork". This legislation supersedes the individual commodity based directives. All the steps in the chain from primary producers (fishermen and aquaculture units) need to take on board, in a more structured manner, the principles of Hazard Analysis Critical Control Point (HACCP) systems and other quality assurance needs thus broadening the scope of the competent authority in regulating the industry. The need to ensure that quality assurance measures are instituted prior to arrival at the processing factory gate poses a major challenge to export industries, particularly for the small-scale and non-industrialised sectors of the industry. Of even greater concern is the fact that in order for the 'farm to fork' principle to be seen to be working a system of traceability of products throughout the chain will need to be instituted (Bostock et al, 2004).

Imports into the USA are regulated under the Federal Regulations, often referred to as 21 CFR 123 (see US FDA Centre for Food Safety and Applied Nutrition web site - www.cfsan.fda.gov). These regulations apply to domestically produced products and imports. They require that processors of fish and fishery products operate preventive control systems that incorporate the seven principles of HACCP.

While new regulations with regard to quality control, such as HACCP, have been adopted by all major importing countries and made compulsory for their fish processing industries, one notable exception is Japan. While some firms in Japan have HACCP systems implemented, there is no mandatory requirement either for domestic processors, nor external suppliers. Standards for imports of fish and fishery products into Japan are governed by the legislation set out in the Food Sanitation Law and the Quarantine Law (Bostock, et al, ibid).

Impact of SPS measures:

SPS related seafood export bans imposed during the 1990s by the EU in Uganda, and EU, Japan, and US in India had significant short- and long-term impacts. Uganda's Nile perch export bans represented major shocks for the fishery sector, leading to short-term loss of exchange earnings, bankruptcies and unemployment. In the medium, to long-term, however, the sector has recovered well, with a smaller but better equipped processing sector, improved marketing strategy, and strengthened institutions. As for India, among the different trade measures, the SPS Measures have been by far the most significant in terms of their impact upon the seafood export sector in the country and led to a virtual reorganisation of its structure and operations. The gains were in terms of improving the local standards to international level, whilst the negative consequences have been the high cost of upgrading the industry, loss of livelihoods and reduced profitability.

6.1.2 TBT Agreement

The TBT Agreement tries to balance the trade-facilitating aspects of standards against their trade-distorting potential by obligating countries to ensure that technical regulations and standards, including packaging, marking and labelling requirements and procedures for assessment of conformity with technical regulations and standards, do not create unnecessary obstacles to international trade or discriminate in favour of domestic producers or goods of different origins. It does this by: encouraging "standard equivalence" between countries; promoting the use of international standards; and mandating that countries notify each other of changes in their standards via enquiry points.

Impact of TBT measures:

The TBT Measures, which affected India in the form of a ban on shrimp exports to the US for not using appropriate measures to reduce turtle mortality caused by trawlers, had less impact upon the sector at the macro-level (i.e., in terms of affecting trade flows), but had a more serious impact at the micro-level by reducing or curtailing access of small-scale fishers to their traditional fishing grounds. In a positive sense, the shrimp-turtle case can be viewed as a case illustrating how markets can play a role in environmental conservation, but in this particular instance, what emerges more clearly is how trade interests might use environmental concerns to further their agendas and ignore them once their purpose has been served, but not before tensions between environmental concerns and livelihood needs of the poor are aggravated.

6.1.3 Rules of origin

Rules of origin are required to ensure accurate tariff assessment (OECD, 2003). Given that fish are caught in many parts of the world and are traded in different forms (e.g. raw, semi-processed and processed) rules of origin present a particular challenge. As a consequence, the proper use and interpretation of rules of origin enhances the predictability and transparency in international fisheries trade. At the same time, from the point of view of exporters, rules of origin can be viewed as a trade impediment.

Duty-free access for ACP fishery products in EU markets is governed by the rules of origin applied to fishery products as part of the Cotonou Agreement (Protocol I, Annex V) (CTA/CFFA, 2005). To obtain duty-free access, ACP fishery products must be "wholly obtained" in the ACP State concerned, the main criteria being for defining "originating products" being registration and flag, ownership and crewing arrangements on the fishing vessels and factory ships, which must basically be either ACP or European.

The restrictions of the rules of origin have led to tensions in EU-fisheries relations, in particular with regard to the valuable tuna fishery (CTA/CFFA, 2005). Given that ACP countries do not have their own tuna fleets, the way "originating fish" is defined effectively forces their processors to purchase from highly priced, EU suppliers (fish from third country vessels is not "originating"). As a consequence, ACP countries have requested that all catches within their national jurisdiction should enjoy originating status regardless of ownership of vessels (see CTA/CFFA, ibid, p12). At the same time, trade observers would argue that in some cases close links between processors and vessel owners help to overcome some of the aforementioned problems.

6.2 Regional fisheries management organisations

As part of DDA, negotiations have been initiated regarding the relationship between existing WTO rules and specific trade obligations set out in multilateral environmental agreements (Lem, 2004a). The objective of these negotiations is to clarify the relationship between WTO rules and trade measures taken to protect natural resources.

Several regional fisheries management organisations have adopted rules for the implementation of trade measures to meet conservation or environmental objectives (OECD, ibid). These include Northwest Atlantic Fisheries Organisation (NAFO), the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Commission of the Conservation of Southern Bluefin Tuna (CCSBT). The rules of these organisations are to be implemented by member states. In certain cases, if countries which are not members of these organisations, are found to be fishing (and trading) in contravention of the rules of the organisation, they may have trade measures imposed on them. In practice, however, only the ICCAT has required its Member countries to take measures against the imports of swordfish, bigeye and bluefin tuna, from a number of nonmember countries (OECD, 2003).

Trade information systems have been put in place as a partial response to the growing concern over Illegal, Unregulated or Unreported (IUU) and "flags of convenience" (FOC) fishing activities (OECD, 2003). Their main task is the proper tracking and monitoring of products from legal fisheries. These systems are necessary if trade measures are to be taken against products from countries fishing in violation of conservation rules. Such systems can also be used to better inform consumers about the products they purchase.

6.3 Trade in Fisheries Related Services

The General Agreement on Trade in Services (GATS) came into force in 1995, and negotiations to further liberalise international trade in services started in 2000. The Doha Ministerial Declaration incorporated these negotiations into the "single undertaking" of the Doha Development Agenda (WTO, 2003). At stake are services such as financial services, telecommunications, distribution, transport, and issues include the movement of natural persons (i.e. temporary migration), cross-border supply, consumption abroad or commercial presence (Stiglitz and Charlton, 2005).

In the context of the fisheries sector, amongst other things, service sector issues can include chartering of vessels where this leads to over expansion of fishing fleets. Chartering of vessels is a sensitive area and one where regional fisheries organisations may have a more important role to play in the future. OECD (2003) suggests that liberalisation of the trade in fisheries services is likely to lead to re-flagging of fishing vessels, for reasons that are similar to the ones that led to the re-flagging of the merchant marine of many OECD countries. This is due to the rules related to manning and registration of vessels being more liberal in some countries than in others, making it cheaper to operate vessels under one flag than another. According to OECD (2003), "there is some reason to believe that much of the fishing operations would be conducted with vessels under foreign flags and employing people from low wage countries if there were a general liberalisation in the trade in fishing services. We have in fact seen some of that happening. Some of the fishing conducted outside the 200 mile zone, where national rules do not apply, has been done with vessels owned by OECD nationals but flying the flags of countries like Belize or Panama and manned by people from Poland, Lithuania and other low wage countries".

At the same time, the potential outcome of current WTO negotiations appears to have little impact on the trade of fisheries related services. As a result, no in-depth analysis of this trade issue has been undertaken. Nevertheless, in particular in light of the increasing importance of major retailers in the fish marketing system, there are lessons to be learned from the SIA Study on Trade of Distribution Services. The final report of this study is available at the SIA website (www.sia-trade.org; Arkell and Johnson (2005)).

6.4 Anti-dumping measures

Although it is not planned to analyse this aspect of international trade in detail, anti-dumping measures (ADMs) merit mentioning in particular in light of recent measures by industrialized nations against exporters from developed or developing countries (e.g. ADMs by the USA and the EU against Norwegian salmon; US ADMs against Vietnamese catfish; and the most recent ADMs by the US against six leading shrimp exporting nations, i.e. Brazil, China, Ecuador, India, Thailand, and Vietnam). As a result, in November 2005 Ecuador have initiated WTO dispute proceedings against the US for its anti-dumping duties on Ecuadorian shrimp imports, alleging that the method used by the USA to calculate the duties contravenes WTO rules (www.ictsd.org/biores/; November 2005).

Dumping is the exporting of produce at less than production cost to the material detriment of competitor industries in the importing country (Peacock, 2004) Though the concept is essentially simple, assessing true production cost is difficult, relying on a range of assumptions and value judgments. Alternative simpler definitions of dumping have accordingly been devised: e.g. “Selling in an export market at a price below that in the domestic market of the producer country”.

The recourse by the importing country supposedly injured is to impose import bans and/or compensating duties (duty orders) on the rogue products in legitimate protection of their own industry. These are called Anti-Dumping Measures (ADMs). Where countries are members of the WTO, the Anti-dumping Agreement regulates the measures taken – where not, bilateral agreements are made.

ADMs have repeatedly failed to achieve their desired effects (i.e. to bring about sustained structural change in favour of the protected industries) (Bostock et al, 2004, based on Peacock, 2004). For example, no significant US salmon or shrimp culture industry has developed – or is likely to do so - in spite of a series of ADMs.

7. Prevention, Mitigation and Enhancement (P, M&E) Measures

The following provides a list of prevention, mitigation and enhancement measures that are being suggested in order to avoid or mitigate negative impacts or improve positive impacts of trade liberalisation. They are based on both literature and findings of the consultation process.

7.1 Economic and trade related measures

As a preventative measure, a gradual (rather than precipitate) reduction of tariffs should be considered to allow some processing industries to adjust (e.g. tuna canneries). For example, substantial tariff reductions (and related preference erosion) would entail a serious threat to tuna processing industries based in ACP countries (e.g. Ghana, Seychelles) that could not be ignored. Similarly, tuna processing industries in Southern Europe (e.g. Galicia) are likely to be hit hard by a sudden reduction of tariffs.

Faced with growing import penetration as a result of past tariff adjustments (and also via increasing competitiveness e.g. via low labour cost economies), the US has sometimes resorted to anti dumping measures as its main line of defence. It is apparent however that such measures may be challenged via the WTO and their future in the current US format may therefore be questionable. An alternative may be to seek to negotiate the pace of any future tariff changes in recognition that sectors will have to adapt to growing liberalisation in the longer term.

In relation to non-tariff measures, the capacity of standard boards should be strengthened to enable them play their role in developing standards, ensuring compliance and certifying exports and imports (e.g. Ghana). Integrated programmes are recommended for improving the infrastructure facilities in order to address the requirements of the 'farm-to-fork' principle (e.g. India). Also, management systems in processing (for export) could be required that are more environmentally friendly (e.g. China).

Investments should be undertaken for the provision of infrastructure, support systems and modern efficient technology in the fisheries sector to reduce production costs and make ACP suppliers more competitive. Regional cooperation amongst private sector stakeholders ought to be considered to enhance economies of scale. It has been recognised that preferential support from development partners ought to benefit the supply side of LDC economies directly, with a view to enhancing productive capacities. Preference-giving countries could make tax advantages available to their investors insofar as these are invested in LDCs. In that context, subsidies granted for foreign direct investment (FDI) and related commitments in LDCs should be considered nonactionable (UNCTAD, 2005).

More efforts should be spent on marketing initiatives such as development of new domestic, regional or overseas markets, and targeting of 'higher-end' quality markets. Options for diversification of trade also include the shifting of focus from a dominant species to currently less traded specie (e.g. shift from shrimp to non-shrimp specie in the case of India). This may take the form of extending support in terms of market research and development, along with providing incentives to the fishers and the exporters opting for diversification. For the EU, this would entail a number of initiatives such as, re-orientation towards the fresh high value segment and away from competitive processed frozen/canned fish; acceptance that primary processing will move east and concentrate on sophisticated added value products (ready meals and fresh foodservice); for tuna canning, concentrate on upmarket top quality branded products in olive oil for the Mediterranean market; and expansion of exports of small pelagics as food fish for Russia, Asia and Africa

Some trade observers consider South - South trade a potential option to mitigate the impacts of the Doha Round, whilst acknowledging that there are also capacity related obstacles to expand trade flows at this level.

Government, research institutions and the private sector should work towards developing aquaculture into a medium to large-scale commercial industry. Whilst Asian countries already have strong aquaculture sectors, in particular African (e.g. Ghana, Uganda) and Latin American countries (e.g. Peru) have potential to increase their capacity in this sector. Given the declining importance of capture fisheries, aquaculture fisheries are becoming increasingly important as a source of protein for human consumption. At the same time, it is recognised that especially in Africa a significant amount of capacity building and improving conditions for inward investment and marketing are required to achieve this target. In addition, environmental issues including the supply of aquafeed require addressing at an early stage (also Section 7.3).

Development assistance or other support from the international community to help cover losses from preference erosion. According to UNCTAD (2005), the idea of financially compensating countries for the adverse effects of preference erosion has never been envisaged as a multilateral trade issue, although financial packages have been common in most bilateral and regional integration schemes. The same source goes on to say that, "the question of financial compensation for LDCs that are faced with the challenge of preference erosion should be at the heart of the current debate on aid for trade". Compensation may be in the form of special frameworks for assistance, trade integration mechanisms, or a compensatory fund. At the same time, it is recognised that the issue of compensatory payments or packages may be difficult to implement from the viewpoint of donor organisations in that, amongst other things, some developing countries that do not benefit from zero tariffs are likely to be opposed to such a policy.

7.2 Social measures

Governments should design and implement alternative livelihood programmes as a safety net for fisherfolk and workers in traditional and modern processing industries affected by tariff changes or subsidy removals. The fact that a relatively high percentage of women tend to work in seafood processing industries ought to be borne in mind in many countries (e.g. EU, India and Japan).

Retraining and skill development measures are already envisaged for fisheries communities in decline as part of the European Fisheries Fund (EFF). Similar initiatives ought to be envisaged in other developed countries and developing countries, with particular attention paid to developing alternative employment prospects for women.

According to the India case study, the existing social subsidies should be continued and strengthened to help the poor in the fisheries sector. The targeting of such subsidies should go beyond mere income criteria (which are largely dubious anyway) and concentrate upon more holistic indicators of poverty.

In the USA social effects tend to arise in tandem with some of the key economic changes that could occur. The shrimp sector around the Gulf of Mexico may represent an area of sensitivity in the aftermath of the distinctly uneven recovery programmes following hurricane Katrina. Impacts on poorer communities could be particularly sensitive. For the salmon sector the need could be for specific programmes geared to native communities currently engaged in the catch sector.

Special and Differential Treatment of small-scale and artisanal fisheries. As highlighted in the case studies and through WTO submissions (e.g. India), it is argued that artisanal and small-scale fisheries should obtain special treatment. Schorr (2005) makes a case that "subsidies to artisanal fisheries deserve and require special treatment under any new WTO fisheries subsidies disciplines", but also emphasizes "the irreducible link between the sustainable management of artisanal fisheries and the long-term economic and social health of the communities that depend on them" given "that many classes of fisheries subsidies, and particularly those likely to increase fishing capacity of effort, can contribute significantly to the risk of overexploitation in artisanal fisheries".

7.3 Environmental measures

An ecosystem approach should be applied in response to environmental concerns related to aquaculture production as well as capture fisheries. This calls for an integrated policy in that "an ecosystem approach should be about integrating environmental, social, and economic objectives so that the needs of humans and those of wildlife, fish stocks and even marine processes can be met both in the short and long-term" (WWF, 2002[6]). In particular, this should address the globally accepted targets of restoring degraded marine and coastal ecosystems to past productivity (WSSD decision, 2002).

The emergence of new regional programmes like the Bay of Bengal Large Marine Ecosystems (BOBLME) programme have the potential to address environmental

[6] WWF (September 2002)

concerns – in terms of protecting biodiversity, addressing pollution, besides managing fish and fisheries resources – in a multi-lateral context. Also, in the case of Japan and China there is scope for improved management of ecosystems and marine fish stocks within the region. Other examples exist around the globe.

Development of fishmeal substitutes; an indirect impact of the growth of aquaculture has been an increased demand for fishmeal, with implications for the fish stocks upon which this depends (e.g. small pelagics). Global fishmeal output has ceased growing and seems likely to remain static at best. Prices are rising and this is prompting a response that will help ameliorate the situation – substitution. In fact for most freshwater species this is already well underway – little fishmeal is used in tilapia feeds now. Shrimp feeds with reduced fishmeal are also being developed and the outlook is for a significant reduction in fishmeal requirements. Albert Tacon in an article in International Aquafeed Magazine (September/October 2005) estimates that the fishmeal proportion should decline by nearly 40% from 2003 levels by 2010. The fact that shrimp feed requires little fish oil (the commodity actually in greatest shortage) allows greater flexibility in this regard. Also, in the case of shrimp culture, improved practices could be required related to the use of antibiotics as a result of trade pressure (e.g. China).

Private sector initiatives; as for a country such as Thailand (i.e. potentially a major beneficiary of trade liberalisation), the environmental threat would seem to be the key candidate for mitigation. The fact that aquaculture is both a cause of and victim of environmental degradation could lead to the adoption of better practices in the longer term. Thailand's emerging major companies - with their long-term perspectives, and encouraged by the emerging ethical sourcing agenda in OECD countries - might provide the impetus for this. Also in China it could be contended that the private sector could take up a number of functions supported by current subsidies, but the generally small scale and dispersed nature of the sector would tend to argue against this (except perhaps for mariculture of shrimp for export).

Certification and eco-labelling schemes should be considered as a tool to achieve both fisheries management and marketing objectives. The objective of such schemes is to create market-based incentives for better management of fisheries by creating consumer demand for seafood products from well-managed stocks or from sustainable aquaculture (Lem, 2004). Although there may be some concerns related to issues such as legitimacy, credibility, and certification requirements, a slow change of perception appears to be taking place. For example, some of the largest retailers in the United Kingdom have now committed to source fisheries products from sustainable fisheries (personal communication: Dr Oluyemisi Oloruntuyi, Marine Stewardship Council). Nevertheless, observers also point out that the positive impact of eco-labelling should not be overestimated despite positive tendencies in the UK in that, in the medium term, it appears only to provide niche market opportunities.

It has been stressed that certification and eco-labelling schemes should be voluntary and price premiums should compensate for the costs of certification and compliance. There is a certain danger that large-scale retailers might capture the bulk of the benefits resulting from eco-labelling. Also, in particular in developing countries concerns have been raised that weaker stakeholders might lose out if they cannot meet the necessary requirements or afford to participate in the certification process. The FAO "Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries" should be adhered to in the development of relevant schemes (FAO, 2005). Similar guidelines are being developed for aquaculture products.

<u>Stopping illegal, unreported, and unregulated (IUU) fishing</u> is increasingly seen as one of the main requirements to achieve sustainable fisheries. Recent studies put the worldwide value of IUU catches at between USD 4 billion and USD 9 billion per annum (HSTF, 2006) [7]. While USD 1.25 billion of this comes from the high seas, the remainder is taken from the exclusive economic zones (EEZs) of coastal states. Losses from the waters of sub-Saharan Africa amount to USD 1 billion a year. Analyses reckon that IUU fishing persists due to a combination of economic incentives (fuelled by demand, overcapacity, and weak governance) and lack of global political resolve to tackle its root causes. The implementation plan spells out the following action points to tackle the problem:

- Enhance international monitoring, control and surveillance (MCS) network
- Establish global information system on high seas fishing vessels
- Participation in UNFSA (UN Fish Stocks Agreement) and FAO
- Promote better high seas governance (RFMOs)
- Adopt and promote guidelines on flag state performance
- Support greater use of port and import measures
- Fill critical gaps in scientific knowledge and assessment
- Address the needs of developing countries (i.e. support vulnerable developing countries to adopt relevant task force measures).
- Promote better use of technological solutions (e.g. remote vessel monitoring systems)

In this context, there has been growing recognition of the need for Regional Fisheries Management Organisations (RFMOs) to perform better both individually and collectively, as well as the need for increased cooperation between them on issues of common concern. International consensus is already forming around the need to reform RFMOs and to initiate processes for improving their performance.

If Fisheries Partnership Agreements (FPAs) were to be outlawed or reduced under WTO, then replacing support for fisheries management would be required through development aid programmes.

<u>Reduction or redeployment of fishing capacity</u>; in Peru, for example, it is estimated that the processing and fleet capacities are twice the size needed to harvest the average permitted catches, and any reduction scheme would therefore have to be carefully considered to avoid financial losses and political repercussions. In India it has been

[7] High Seas Task Force (2006)

suggested to redeploy the surplus inshore fishing fleet to the offshore waters and deep seas.

Subsidised decommissioning programmes have already been implemented in the EU with mixed success, and this measure is likely to continue. Similar measures are used in the case of East Asian fishing fleets (e.g. China) and may well continue.

7.4 Process measures

Capacity building and institutional support: a number of measures to this effect have been suggested in the country case studies, e.g.

- Measures are suggested to build the capacity that is required to ensure sustainable development of the fisheries industry (e.g. resources for the Regional Maritime Academy in Ghana).
- Institutional capacity needs to be built both to understand the possible implications of the DDA and to develop the ability of coping with possible changes (e.g. Uganda).
- Monitoring, control and surveillance (MCS) capacity needs to be built and maintained, also if Fisheries Partnership Agreements were to be abandoned or downscaled (e.g. Seychelles). This has to be reflected in relevant policy documents.
- Resource assessment studies to determine the potential availability of marine (inshore and offshore) and brackish-water resources and their current levels of exploitation (e.g. India). Also, more pro-poor orientation in policymaking and implementation has been suggested in India.

Government regulation: for example, in the context of the rapidly growing seafood industry in countries such as Thailand there is a need for the Government to take a strong role in regulation, especially in order to avoid the increase of environmentally damaging developments. This may lead to political conflict (with entities being regulated, e.g. the shrimp farming or fishing communities) and economic conflict (with the drive for national economic development) and so will be very challenging.

With WTO membership, China has developed a growing engagement with institutions and in debates affecting the fisheries sector. Overall it is in China's interest to pursue greater liberalisation where it stands to gain in terms of further expansion in processing activity and trade.

Table 16: Summary of Prevention, Mitigation, and Enhancement (P, M&E) measures

Measures	Impact	Cost effectiveness	Feasibility
Economic and trade related measures			
Gradual (rather than precipitate) reduction of tariffs.	Should allow fisheries and processing industries to adapt to changes in both economic and social terms	High cost effectiveness Also any sudden loss of tariff revenues could be avoided especially by LDCs	High, once agreement has been reached
In relation to non-tariff measures, capacity building of standard boards; Integrated programmes are recommended, taking local conditions into account.	Required for ensuring compliance and certifying exports and imports. Also, management systems in processing (for export) could be required that are more environmentally friendly	Medium cost effectiveness, given that many countries need substantial amounts of support and capacity building; however, in the longer-term this is a measure which cannot be avoided for an export country to fully participate in international trade	Medium, may take time until all countries are up to speed; although some major export countries have made significant investments in this regard since the mid-1990s
Investments for the provision of infrastructure, support systems and modern efficient technology to make developing country suppliers more competitive.	Likely to have substantial impact in economic and ultimately social terms; Technologies that are adverse to the environment should be avoided	Low to medium, given that substantial amounts of funds are required, and benefits may only be seen in the medium to longer-term; High maintenance costs may be of an issue	Low to medium, given that many countries (in particular ACP and LDC) will depend on external assistance
Marketing initiatives such as development of new domestic, regional or overseas markets, and targeting of 'higher-end' quality markets.	Economic impacts as a result of increased trade Increased government revenues (through taxes) that can have social knock-on effects	Variable cost effectiveness, given that large investments are unlikely to be required	Variable bearing in mind that there is strong competition between countries and not all of them will be equally successful
Development of aquaculture into a medium to large-scale commercial industry; (e.g. Africa).	Economic and social impacts in terms of increased income, food security and health	Low to medium, given that substantial investments and capacity building are required in particular in sub-Saharan Africa	Low to medium, in view of the relatively complex, technical economic and capacity building requirements and time-scale required
Development assistance or other support from the international community to help cover losses from preference erosion.	Potential economic, social and environmental impacts	Cost effectiveness depends on quality of assistance programmes and management of funds	Depending on the exact scale of preference erosion, there may be difficulties with practical implementation

Measures	Impact	Cost effectiveness	Feasibility
Social measures			
Design and implementation of alternative livelihood programmes;	Economic, social and potentially environmental positive impacts	Medium, given that diversification programmes depend on existing alternatives (e.g. natural resources, markets)	Although recognized as a priority, it is not always straightforward to implement diversification programmes;
Retraining and skill development measures in particular for women;	Social and economic impacts	Medium cost effective-ness if well designed and targeted and alternative livelihoods opportunities are available	Moderate feasibility
Existing social subsidies should be continued and strengthened	Measures to help the poor in the fisheries sector – therefore economic and social impacts	Medium cost effectiveness. Proper targeting and use of more holistic indicators of poverty are advised (e.g. India);	Medium feasibility given that substantial amounts of money will be required
Remote communities depending on fisheries might benefit from specific programmes geared to their needs	Economic impacts with social and perhaps environmental knock-on effects	Low to medium cost effectiveness if support goes against economic fundamentals	High feasibility, however dependant on budgetary constraints
Special and Differential Treatment of small-scale and artisanal fisheries.	Economic, social and (potentially negative) environmental impacts in developing countries	High cost effectiveness, however long-term environmental costs need to be avoided	Highly feasible, assuming that agreement can be reached
Environmental measures			
Application of an ecosystem approach in response to environmental concerns related to aquaculture production as well as capture fisheries;	Positive environmental impacts, but also economic and social knock-on effects	Medium cost effectiveness given that substantial sums of money may be required for the implementation of a holistic approach	Probable feasibility, bearing in mind that adequate prioritization of action points is important in holistic programmes; conflicts between livelihoods and environmental concerns possible
Development of fishmeal substitutes;	Positive environmental impact	Highly cost effective in view of rising fishmeal prices	Feasible, given that research and development is already in progress
Private sector initiatives and public, private partnerships;	Environmental and economic impacts	Highly cost effective if private sector gets involved	Medium feasibility, depending on differing private and public sector objectives being reconciled

Measures	Impact	Cost effectiveness	Feasibility
Eco-labelling should be considered as a tool to achieve both fisheries management and marketing objectives;	Positive environmental and economic impacts but may work against artisanal sector	Variable cost effectiveness depending on level of certification costs, which could be high	Medium feasibility. Despite some initial concerns a change of perception appears to take place
Stop illegal, unreported, and unregulated (IUU) fishing;	High environmental benefits Some loss of income	Medium cost effectiveness, given that substantial sums of money will be required for MCS activities and related capacity building	Medium feasibility in view of economic incentives to carry on with IUU fishing, and lack of global political resolve
Reduction or redeployment of fishing capacity.	Positive environmental impacts; negative economic impacts unless alternatives can be found	Medium cost effectiveness, given that results so far have been mixed	Medium feasibility given that loopholes need to be avoided
Process related measures			
Capacity building and institutional support;	Benefits in relation to greater institutional capacity and transparency	Cost effectiveness depends on exact measures given that some are more cost intensive than others	High to medium feasibility, as long as sensitive issues do not lead to conflict.
Government regulation (e.g. in the context of the environment and the rapidly growing seafood sector in countries such as Thailand);	Positive environmental benefits but economic growth may be curtailed	Highly cost effective if robust enforcement	Feasibility may be a challenge in view of conflicting environmental and economic interests
Engagement with institutions and in international debates affecting the fisheries sector	Positive impacts related to process / governance issues and ultimately environmental, social and economic benefits	Medium to highly cost effective	Highly feasible, provided there is political will

Sources and References

APEC (2005) (website), Tariff database. Asia-Pacific Economic Cooperation, APEC Secretariat, Singapore.

Arkell J and Johnson MDC (2005) *Sustainability Impact Assessment of Proposed WTO Negotiations: Final Report for the Distribution Services Study*, ITSP and Institute for Development Policy and Management, University of Manchester

Bostock, T., Greenhalgh, P., Kleih, U. (2004) *Policy Research – Implications of Liberalization of Fish Trade for Developing Countries: Synthesis Report.* Chatham, UK: Natural Resources Institute. ISBN 0 85954 560-1.

Cato, J.C and Lima dos Santos, C.A. , (2000) "*Costs to Upgrade the Bangladesh Frozen Shrimp Processing Sector to Adequate Technical and Sanitary Standards and to Maintain a HACCAP Programme*" in: Unnevehr, L. (ed.) The Economics of HACCP: New Studies of Costs and Benefits, St. Paul, MN: Eagan Press, pp 385-402.

CBI (2005) EU market survey 2005: *Fishery Products - Food Marketing services*, CBI Centre for the Promotion of Imports from Developing Countries.

Cox, A. (2006) *Financial Support to the OECD Fisheries Sector – Policy Implications,* Presentation at FAO/UNCTAD workshop on the impact of WTO agreements and negotiations on the fisheries sector, 20-21 March 2006, Geneva.

CTA (2005) Website: ACP-EU Fisheries relations news update (2004): *Market access, tariff and non-tariff aspects CTA: Technical centre for Agricultural and Rural Cooperation ACP-EU.*

CTA and CFFA (2005) *ACP-EU Economic Partnership Agreements – Fisheries*; Discussion Paper No 69; CTA and Coalition for Fair Fisheries Arrangements; European Centre for Development Policy Management. www.ecdpm.org/dp69

Deere, Carolyn L. (1999) *Eco-labelling and Sustainable Fisheries*, IUCN: Washington, D.C. and FAO: Rome.

Delgado, C.L., Wada, N., Rosegrant, M.W., Meijer, S., Ahmed, M. (2003) *Fish to 2020 - Supply and Demand in Changing Global Markets*; International Food Policy Research Institute and WorldFish Center, Washington D.C. and Penang, Malaysia.

DFID (1998) Carney D, (Ed.), *Sustainable rural livelihoods: What contribution can we make?* Papers presented at the Department for International Development's Natural resources Advisers conference, July 1998.

European Commission (2003) Financial Instrument for Fisheries Guidance; Brussels.

European Commission (2005) Fishery Statistics; Data 1990 – 2004; Pocketbooks. Eurostat.

European Union (2005) Commission Regulation (EC) No 1719/2005 of 27 October 2005; amending Annex I to Council Regulation (EEC) No 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff. Official Journal of the European Union.

FAO (no date) FAO Support to WTO negotiations 4 – Fisheries trade issues in the WTO; Food and Agriculture Organization of the United Nations; Rome.

FAO (2005) FAOSTAT. Food Balance Sheets (Updated August 2004), FAO, Rome

FAO (2004) *The state of world fisheries and aquaculture 2004*, FAO Rome.

FAO (2004b) *Future prospects for fish and fishery products: medium- term projections to the years 2010 and 2015*; FAO Fisheries Circular FIDI/972-1 (in press)

FAO (2003a) *WTO agreement on agriculture, the implantation experience - Developing country case studies*. Economic and Social Department, FAO Rome.

FAO (2003b) The state of world fisheries and aquaculture 2002, FAO Rome.

FAO (2002) Trollvik T, *The impact of World Trade Organisation Agreements on Fish Trade,* FAO Fisheries Circular No. 977, FAO Rome

FAO (2002*) Twenty Five Ways to improve the Derbez draft on agriculture.* International Food and Agricultural Trade Policy Council FAO, Rome

FAO. (1999). *Historical consumption and future demand for fish and fishery products: exploratory calculations for the years 2015/2030*, by Y. Ye. FAO Fisheries Circular No. 946. Rome.

Fisher, B (2005) *Preference Erosion, Government Revenues, and Non-tariff Trade Barriers*; Nathan Associates; www.nathaninc.com

Foth, M. and Krause, G. (2005) *Integrated Coastal Zone Management: The panacea for the future of the coastal zones?* Article in Agriculture & rural development 2/2005. pp33-35.

Friends of the Earth International (2005) *The tyranny of free trade – wasted natural resource wealth and lost livelihoods,* Hong Kong, ISBN 90-0914913-9.

Gardiner, P. and Viswanathan, K. (2004). '*Ecolabelling and Fisheries Management'. World Fish Centre*.

George, C., and Kirkpatrick, C. (2004) *Trade and Development: Assessing the Impact of Trade Liberalisation on Sustainable Development*; Journal of World Trade 38 (3); pp441-469.

Globefish (2000) Filhol A., *Effects of the World Trade organisations regulation on world fish trade*, FAO, Rome

Globefish (2004) Audun Lem, *China the WTO and world fish trade*, Globefish country reports. FAO Rome

Globefish (2004) Josupeit H, *International fish trade regulatory framework*: Infofish Tuna Conference, Bangkok, Thailand.

Greenpeace (no date) Knirsch, J. et al; Deadly subsidies – How government funds are killing oceans and forests and why the CBD rather than the WTO should stop this perverse use of public money; Greenpeace International, Amsterdam. (available at www.greenpeace.org).

Grynberg, R. (2003) WTO fisheries subsidies negotiations: implications for fisheries access agreements and sustainable management, *Marine Policy,* 27: 499-511.

Hannesson, R. (1994) *Optimum Fishing Capacity and International Transfer of Excess Allowable Catches*, in: Land Economics, Vol. 70, pp330-340.

Hannesson, R. (2000) *Renewable Resources and the Gains from Trade*; in: Canadian Journal of Economics, Vol 33, pp122-132.

High Seas Task Force (2006) *Closing the net – stopping illegal fishing on the high seas*; Summary proposals of the Ministerially-led Task Force on IUU Fishing on the High Seas; IUU Fishing Coordination Unit, London.

ICTSD (2005) website. Various copies of Bridges Trade BioRes; e.g. Vol 5, Number 21 25 November 2005; Volume 6, Number 3, 17 February 2006); International Centre for Trade and Sustainable Development, Geneva, and The World Conservation Union. (available at: www.ictsd.org)

ICTSD (2005) *Untangling Fisheries and Trade: Towards Priorities for Action;* ICTSD Dialogue, 9-10 May 2005, International Centre for Trade and Sustainable Development, Geneva.

IFPRI. (2003). Fish to 2020: *Supply and Demand in Changing Global Markets*, by C. Delgado, N. Wada, M. Rosegrant, S. Meijer and M. Ahmed. International Food Policy Research Institute (IFPRI), Washington, DC.

Infofish (2005) (website) *Information on fisheries management in the Republic of Ghana*, FAO, March 2005.

IUCN (2004), *Sanitary and Phyto Sanitary Barriers to Trade and its Impact on the Environment – The Case of Shrimp Farming in Bangladesh*, IUCN-The World Conservation Union, Bangladesh.

Katila, M., and Simula, M. (April 2004) *Sustainability Impact Assessment of Proposed WTO Negotiations – Inception Report for the Forest Sector Study*. Indufor Oy, Finland.

Keizire, B. B. (2004) *Policy Research: Implications of Liberalisation of Fish Trade for Developing Countries - A Case Study for Uganda*; Project PR 26109; Food and Agriculture Organization (FAO) of the United Nations, Rome.

Khatun, F., Rahman, M., and Debapriya, B. (2004) *Fisheries Subsidies and Marine Fisheries Resource Management: Lessons from Bangladesh*, United Nations Environment Programme, Geneva, 2004.

Kirkpatrick, C. and Lee, N. (2002) Further *development of the methodology for sustainability impact assessment proposed WTO negotiations: Final report to the European Commission*, IDPM, University of Manchester

Kirkpatrick, C., and Lee N, (1999) WTO *new round: Sustainability impact assessment study, Phase Two Main Report*, IDPM/Environment Impact Assessment Centre University of Manchester.

Kowalski, P. and Lippoldt D. (2005), " Trade Preference Erosion: Potential Economic Impacts ", *OECD Trade Policy Working Papers*, No. 17, OECD Publishing.

Kurien, J. (2000). 'Behind *the label: Are eco-labels the answer to sustainable fishing*?' New Internationalist 325, July 2000.

Lem, A., FAO (2004a), *WTO Trade rules with an update on the Doha Round negotiations and a short reference to anti-dumping action and the shrimp case*, WAS Honolulu.

Lem, A. (2004b), *Presentation of Fisheries Issues in the ACP-EU negotiations*; Addis Abeba, December 2004.

Lem, A (2005), *Fishery issues in the ACP-EU negotiations*; Accra, 16 February 2005. Powerpoint presentation available online.

Limao, N, and Olearraga, M. (2005) *Trade Preferences to small developing countries and the welfare costs of lost multilateral liberalisation*; Policy Research Working Paper 3565 (quoted in UNCTAD, 2005).

Macfadyen, G. (2004), Trade Issues Background Paper: Ethical /Social /Eco Certification, Labelling and Guidelines, as part of project "*Policy Research –*

Implications of Liberalisation of Fish Trade for Developing Countries", Bostock et al (2004).

Marine Resources Assessment Group Ltd (MRAG) with Cambridge Resource and International Institute for Environment and Development (2000), *The Impact of Fisheries Subsidies on Developing Countries*, DFID Policy Research Programme, project CNTR 98 6509.

Mathew, S. (2002), International Collective in Support of Fishworkers (ICSF). *'Sustainable Fishing and Social Well Being: The Marine Stewardship Council and the Fair Trade Initiative'*.

Melchior, A. (2005) *The Fishy Story About Tariffs in World Seafood Trade*; Paper written for Food and Agriculture Organization of the United Nations, Rome.

Milazzo, M. (1998) *Subsidies in World Fisheries: A Re-examination*, World Bank Technical Paper No 406

MRAG/Soil Association/IIED (2000). '*Relevance of Certification to Fisheries in Developing Countries'*. DFID Contract: 7381CA Final Report, 2000.

Nautilus Consultants and IIED (2003). '*Investment Mechanisms for Socially and Environmentally Responsible Shrimp Culture'*.

Nordberg, E. (2005) From cash-for-access towards true partnership – Combining sustainable resource use and fisheries access agreements; Article in *Agriculture & rural development* 2/2005. pp36-37.

ODI (2004) Page S, Principal issues in the Doha negotiations, ODI Briefing Papers 2, Overseas Development Institute, London.

ODI (2004) Page S, How developing countries can negotiate, ODI Briefing Papers 3, Overseas Development Institute, London.

OECD, 2000; *Possibility of liberalization of the market in the fisheries sector in the OECD countries,* Organisation for Economic Cooperation and Development, Paris.

OECD (2003) Liberalising *fisheries markets: scope and effects*. Organisation for Economic Cooperation and Development, Paris.

OECD (2005) *Subsidies*: *A Way Towards Sustainable Fisheries*? Policy Brief, December 2005; Organisation for Economic Cooperation and Development, Paris.

Polaski, S. (2006) Winners and Losers – Impact of the Doha Round on Developing Countries; Carnegie Endowment for International Peace, Washington DC.

Porter, G. (1998). Fisheries Subsidies, Overfishing and Trade. Geneva: United Nations

Environment Programme.

Porter, G. (2002). Fisheries Subsidies and Overfishing: Towards a Structured Discussion. Geneva: United Nations Environment Programme.

Scharm, W. (2005) *Are EU access agreements harming Africa's artisanal fisheries? – Tensions between the EU and West Africa off Africa's coasts*; Article in *Agriculture & rural development* 2/2005. pp38 – 40.

Scholz, U., and Schirm, B. (2005), *How important is the fishery sector for the developing world?* Article in *Agriculture & rural development* 2/2005. pp30-32.

Schorr, D.K. (2005) *Artisanal Fishing: Promoting Poverty Reduction and Community Development Through New WTO Rules on Fisheries Subsidies*; Paper commissioned by UNEP Economics and Trade Branch (Working draft, June 2005).

Schrank, W. E (2003) Introducing Fisheries Subsidies. FAO Technical Paper 437, Food and Agriculture Organization of the United Nations, Rome.

Stiglitz, J. E. and Charlton, A. (2005) *Fair Trade For All – How Trade Can Promote Development;* Oxford University Press.

UNCED (1992) Agenda 21: *The Rio Declaration on environment and development*: Chapter 17: Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-enclosed Seas, And Coastal Areas and the Protection, Rational Use and Development of Their Living Resources

UNCED (1992) Agenda 21: *The Rio Declaration on environment and development*: Chapter 18: Protection of the Quality and Supply of Freshwater Resources: Application of Integrated Approaches to the Development, Management and Use of Water Resources .

UNCTAD (2005) *Erosion of Preferences for the Least Developed Countries: Assessment of Effects and Mitigating Options*; United Nations Conference on Trade and Development.

UNEP (2005) Website: System-wide Earthwatch : *Crisis in ocean fisheries*, United Nations Environment Programme.

UNEP (2004) *Analyzing the Resource Impact of Fisheries Subsidies: A Matrix Approach*; United Nations Environment Programme.

UNEP (2004b) *Incorporating Resource Impact into Fisheries Subsidies Disciplines: Issues and Options* – A Discussion Paper; United Nations Environment Programme.

United Nations Industrial Development Organization (UNIDO), 2003. *Successful* *capacity building in fish safety/quality for trade facilitation in Uganda*.

USDA (2005) Website Ghana trade survey paper.

Vannuccini, S. (2004) *Overview of Fish Production, Utilization, Consumption and Trade* (based on 2002 data), Food and Agriculture Organization of the United Nations; Rome.

Westlund, L. (2003) *Draft Guide for Identifying, Assessing and Reporting on Subsidies in the Fisheries Sector*, in FAO (2003) Report of the Expert Consultation on Identifying, Assessing and Reporting on Subsidies in the Fishing Industry, Rome 3-6 December 2002, FAO Fisheries Report no 698, FIPP/R698 (En), Rome: FAO.

Wijkström, U.N. (2003). *Short and long-term prospects for consumption of fis*h. Veterinary Research Communications, 27(Suppl. 1): 461–468.

Willems, S., Roth, E., van Roekel, J. (2005) *Changing European Public and Private Food Safety and Quality Requirements - Challenges for Developing Country Fresh Produce and Fish Exporters*. European Union Buyers Survey; World Bank, Washington D.C.

World Bank (2004) *Saving Fish and Fishers – Toward Sustainable and Equitable Governance of the Global Fishing Sector*, Report No. 29090-GLB, The World Bank – Agriculture and Rural Development Department; Washington D.C.

World Wide Fund for Nature (WWF) (2001) *Hard Facts, Hidden Problems - A Review of current data on Fishing Subsidies.* A WWF Technical Paper.

WTO (2001) Trade topics: Trade policy Ghana Feb 2001. Trade Policy Reviews, Press Release, February 2001; WTO, Geneva, Switzerland.

WTO (2001) *Ministerial Declaration, Fourth Ministerial Conference*; Doha, 9 – 14 November 2001; World Trade Organization, Geneva.

WTO (2003) *Understanding the WTO*; World Trade Organization, Geneva.

WTO (2005) *Ministerial Declaration, Sixth Ministerial Conference*; Hong Kong, 13 – 18 December 2005; World Trade Organization, Geneva.

WTO; Various Member submissions to the Negotiating Group on Rules.

WWF (September 2002) *Delivering an ecosystem approach – the need for a Marine Act*, Marine Update.

Appendices – Case Studies (available as separate documents)

Appendix 1: China - NRI

Appendix 2: European Union – NAP Fisheries and NRI

Appendix 3: Ghana - Victor Antwi et al, Baafie Consult, Accra, Ghana

Appendix 4: India - Venkatesh Salagrama and Thaddeus Koriya, Integrated Coastal Management, Kakinada, India.

Appendix 5: Japan and USA – NRI

Appendix 6: Peru - John Tilman, Lima, Peru

Appendix 7: Seychelles – Nigel Peacock, NAP Fisheries

Appendix 8: Thailand - Nigel Peacock, NAP Fisheries

Appendix 9: Uganda - Boaz B. Keizire, Department of Fisheries Resources, Uganda