出國報告（出國類別：其他）

參加『經濟合作發展組織(OECD)』主辦之「第100屆漁業委員會(COFI) 」報告

服務機關：行政院農業委員會漁業署
姓名職稱：王清要副組長
派赴國家：法國
出國期間：96年10月26日至11月2日
報告日期：96年12月3日

參加『經濟合作發展組織(OECD)』主辦「第100屆漁業委員會(COFI）」報告

摘　要

一、『經濟合作發展組織(OECD)』主辦之「第100屆漁業委員會(COFI）」於2007年10月29日至31日在法國巴黎OECD總部的一樓C室或二樓G室舉行，在我國派駐巴黎代表處一等秘書陳宗儀安排下，由我國農委會漁業署副組長王清要代表出席，並有國立臺灣海洋大學王冠雄副教授至OECD蒐集資料順道陪同參加。

二、漁業全球化趨勢及走向已日漸明朗，後續區域整合及國家間自由貿易協定勢必對我產業有一定層面之影響，未來仍應積極派員參與相關會議，依時填報問卷與統計數據，維持一般觀察員發聲機制，政策上及早因應，伺機擴大參與。

三、「漁業」是我國少數幾個得以「一般觀察員」身分參與OECD年會的部門，建議由本署持續與OECD漁業小組保持密切聯繫，並積極派員出席相關會議，儘可能表達看法，如能上臺發表論文，接受評論與回復意見將更有貢獻，並能贏得尊重。我方以「觀察員」身分參與年會，在評論或討論上需排在會員國之後，建議利用個案研究報告取得主導權，以先報告後再接受評論或討論方式，可增加曝光率。

四、OECD將於明(96)年4月主辦第101屆漁業委員會(COFI)，並請各國提報一份有關國際漁業配額分配之個案研究報告，擬請及早核派人選及準備報告資料，並積極蒐集資料參與評論，；另擬由本署配合OECD填報2006年經濟統計相關資料，以增加在國際上之能見度及加強與OECD合作互動。

五、OECD會員多爲歐美先進國家，尤其以歐盟國家作爲主體。各國參加人員亦參與聯合國糧農組織(FAO)、世界貿易組織(WTO)、大西洋鮪類保育委員會(ICCAT)、印度洋鮪類保育委員會(IOTC)、中西太平洋漁業委員會(WCPFC)、美洲熱帶鮪類組織(IATTC)、南方黑鮪保育委員會(CCSBT)等國際組織會議，相關的漁業管理議題可進行溝通協商，因此，建議我方可在美、日、歐盟外，加強與英、加、紐、澳等國的諮商交流與互動，使我方意見能充分反映，以獲取日後更強而有力之支持。

六、生態系爲基礎之管理、生態標籤及水產養殖將是未來兩年的重要研究主題，未來建請在專案計畫可配合進行研究，並俟機與COFI合作專案研究計畫或合辦相關研討會，以共同關切議題活絡關係，並促進與相關國家的互動，營造有利於參與國際社會的條件。

七、中國大陸海洋捕撈業與水產養殖之生產量已占世界最大比重，其地位受到關注，本次OECD將該國及南非、印度及巴西列爲積極爭取合作對象，對我方之影響應密切注意；爲了避免受到中國大陸排我之影響，建議我駐外單位及本署密切注意今後之發展，並積極投入相關會議活動，以確保我國參與的權益。

出席『經濟合作發展組織(OECD)』主辦「第100屆漁業委員會(COFI) 」報告

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出席『經濟合作發展組織(OECD)』主辦「第100屆漁業委員會(COFI) 」會議報告

壹、 目的

一、經濟合作及發展組織 (OECD)有30個會員國，積極參與漁業委員會(COFI, COMMITTEE FOR FISHERIES)運作約有27個國家，主要爲歐、美、日、加、紐、澳及韓等重要漁業國家。COFI主導當前國際全方位漁業政策改革，匯集許多內外部專家學者意見，近年對責任制漁業、永續發展、漁業全球化、漁撈能力、生態漁業等議題著力甚深，影響聯合國糧農組織(FAO)及世界貿易組織(WTO)等國際相關組織的政策方針，進而並發揮企劃之角色，受到許多國家之重視。我國爲重要的遠洋與養殖漁業國家，相關的漁業政策改革都受到諸多關注，因此，派員積極參與OECD的相關年會或研討會，並適時貢獻觀點及經驗，對我國參與國際組織及提高國家之能見度有極大之助益。

二、我國在民國94年以中華臺北(Chinese Taipei)「專案觀察員」名義開始參與OECD的COFI，僅能以專案邀請方式參與，至95年5月11日才由OECD理事會決議授予我國「一般觀察員」身份參與爲期二年，使觀察員身分正常化，該一般觀察員至下(97)年11月即第102屆漁業委員會由會員國重新授予。爲確保或提昇我國在OECD COFI的地位，積極參與及提供經驗分享不可或缺，因此派員參加一年兩次的會議應有必要。

三、透過經濟合作發展，提昇國家形象，是參與國際組織最重要之任務。我國目前推動的減船措施、休漁、打擊IUU、減少過剩產能、加強遠洋漁業管理及產銷履歷等，皆爲OECD會員國所矚目焦點。COFI以年度業務工作報告與檢討爲主，並將重點主題列成議題進行研討，有本身的專家及所邀請之學者專家提出個案報告，另有國別個案研究，在會議中進行全方位的討論及評論，其結論對全球漁業具有重要影響力。

四、我國歷年積極參與COFI年會各項議題，並查填統計數據、問卷與國家報告，促成與OEC COFI的積極合作與交流。未來仍有必要配合OECD COFI所訂時程，提報各項資料，並將其所蒐集之相關數據及資訊列入重要參考，進行統計分析比較，俾作爲我國漁業政策研擬及產業輔導之參考，有利營造產業永續發展環境。

四、OECD漁業委員會多爲各國參與國際組織之代表性人物，建立各方聯繫管道，有利於未來國際漁業合作及交流。本次委員會出席人員均爲政府官員、國際組織代表及學者專家，除了OECD COFI正式議題外，利用會議之空檔與其他國家代表作非正式溝通及意見交換，或利用餐敘機會進行交

流，對熱絡與相關組織及國家的聯繫管道具助益。

貳、 過程

一、OECD COFI 100屆年會之會議地點在OECD於法國巴黎總部Chateau de la Muette, Salle C 2, Rue Andre Pascal一樓C會議室或二樓G會議室，會議時間原則由上午9時30分至下午1時，下午則由2時30分至6時。本次出席會員國爲德國、澳州、奧地利、加拿大、南韓、丹麥、西班牙、美國、芬蘭、法國、希臘、匈牙利、愛爾蘭、冰島、義大利、日本、墨西哥、挪威、紐西蘭、荷蘭、波蘭、葡萄牙、斯洛伐克、捷克、英國、瑞典、土耳其、歐州委員會(EC)；觀察員有我國、阿根廷及泰國等；國際組織之觀察員則爲世界銀行、歐盟歐委會、聯合國糧農組織(FAO)、ITF及聯合國環境計畫署(UNEP)，以及部分學者專家擔任演講者，與會人數約70餘人參加(附件1)，主席爲美國海洋與大氣總署商務部資深國際貿易專家Mr. Greg SCHNEIDER，會議發言原則爲會員國優先，觀察員在後。

二、本屆年會除業務檢討外，針對計畫執行報告、2009至2010年工作計畫、合作執行計畫、漁業政策改革、漁業全球化、國別漁業統計檢討評估、研究報告與相關資訊、俄羅斯等5國入會在漁業委員會之審查等。除一般議程安排外，10月29日下午2時30分至6時30分另外召開COFI第100屆紀念研討會(Jubilee Workshop)，隨後參加紀念酒會，約下午8時結束。

三、我國係以「一般觀查員」身份，在我經濟部駐巴黎辦事處陳宗儀一等秘書的安排下，由王清要副組長代表，另有國立臺灣海洋大學王冠雄老師來OECD蒐集資料順道陪同參加。本次年會我國除參與討論外，亦提供一份漁撈能力政策改革之個案研究報告「Policy Reform on Fishing Capacity in Chinese Taipei」，本年正式納入OECD官方文件(如附件)，由秘書處正式列入第二日議程，安排王員上臺報告及接受詢答(附件2,3)，並列入正式紀錄。

參、 會議紀要

本次會議除 OECD COFI 例行工作報告，內容也包括全球化、生態標籤、地球暖化、水產養殖等議題，豐富的題材可作爲相關單位參考，茲按日分述如下：

11 月 29 日：

一、美國海洋漁業局資深貿易專家Greg SCHNEIDER擔任委員會主席，貿易及農業處處長Stefan TANGERMANN及漁業組組長Carl-Christian SCHMIDT以秘書處名義協助。

二、首先通過採認100屆委員會議程。

三、貿易及農業處長報告：貿易及農業處長報告最新合併的發展與議題，以及其他與委員會工作有關議題，強調OECD與南非、巴西、中國及俄羅斯加強合作。

四、重新檢視委員會授權：由更新授權工作小組主席，也是加拿大漁業暨海洋部的國際協調與政策分析司司長的Lori RIDGEWAY女士報告，需在六個月內進行授權更新，在少許討論後做爲未來的工作方向指引。

五、漁業委員會的深入評估：由漁業政策組組長Carl-Christian SCHMIDT提報漁業委員會深入評估的更新後的計畫，亦進行少許討論。

六、計畫執行報告(PIR)：在Carl-Christian SCHMIDT報告後，委員會進行討論及評論2005-2006年PIR執行結果，並對委員會2009-2010年的工作計畫進行熱烈討論，有三份文件提供參考(附件4)。

七、委員會2009-2010年的工作計畫：Carl-Christian SCHMIDT提報2009-2010年工作計畫的主題建議，包括以生態系爲基礎之管理(***Ecosystem-based management***)、推動經濟有效之國際漁業管理(***Promoting economic efficient international governance in fisheries***)、不作爲成本-延遲漁業作業改革之成本(***Costs of inaction -- costs of delaying fisheries policy reform***)、監控及評估漁業重要趨勢及議題，包含政府財政移轉(***Monitoring and evaluation of key trends and issues in fisheries, including government financial transfers***)、水產養殖：與捕撈業之政策挑戰與互動(***Aquaculture: policy challenges and interactions with capture fisheries***)、至2015年重建漁業資源：夢想vs真實(***Rebuilding fish stocks by 2015: Dreams vs. reality***)、氣候變遷與漁業(***Climate change and fisheries***)及生態標籤(***Eco-labelling***)等8項(附件5)，其中生態標籤議題受到廣泛討論。

八、當日下午會議重點：

下午主要是OECD COFI 100屆紀念研討會及茶會，研討會主題爲「漁業政經改革」(The Political Economy of Fisheries Reform)，內容包括：

(一)由COFI主席Greg SCHNEIDER 致歡迎詞。

(二)由OECD副秘書長Aart JAN DE GEUS主講「OECD政經改革工作：跨部門課題」(OECD Work on Political Economy of Reform: Trans-sectoral Lessons)。

(三)美國羅德島大學教授John SUTINEN主講「漁業產業改革的主要挑戰：政經面」(Major Chanllenges for Fishing Industry Reform: A political Economy Perspective)。

(四)丹麥國家漁業政策辦公室主任Mogens KJORUP主講「丹麥漁業政策

改革的心得」(Lessons Learned from Danish Fisheries Policy Reform)。

(五)再經過少許討論後，由Greg SCHNEIDER作總結。

九、我代表團主動邀請日本OECD代表團也是世界貿易組織(WTO)代表團的日本水產廳加工流通課八木信行副課長，在29日午休時餐敘，並交換WTO等議題意見，渠認為NAMA及補貼議題將視主席文件再俟機表答意見，臺日在WTO議題合作立場不變。

十、我代表團於會場亦與美國國務院海洋保育辦公室副主任(Deputy Director)David Hogan作交談，渠談及臺美MOU已在最後階段，希望雙方能落實MOU，職則以相關議題互相協調合作極為必要回應；另美國海洋漁業局國際事務辦公室主任(Director) Dr. Rebecca LENT則與職交談時，表示上週與本署沙副署長在華盛頓交換過意見，美方同意在大西洋鮪類保育委員會(ICCAT)支持我方的立場，歐盟部分國家可能有雜音，職則表達感謝之意，並希望能繼續支持我方。

十一、有關2009-2010年工作計畫的主題建議，我方評論提出：支持英國及美國對「推動經濟有效之國際漁業管理」主題的建議，惟除經濟層面，也建議應納入社會層面，較符合漁業經營實際狀況。

11月30日：

一、繼續討論及評論2009-2010年工作計畫，各國仍對生態標籤、水產養殖及生態系為基礎之管理，表達高度興趣之意。

二、由合作研究計畫(CRP)主席Mr. Tony Burne介紹其現在進行的相關活動，其強調CRP提供全方位農產品研究之基金，涵蓋漁業及水產養殖。

三、漁業政策改革：1.審查第二版「減船計畫政經能力調整報告」草案，由秘書處報告，改版文件將納入會員國及其他專案研究之意見(附件6)；2.漁業政策改革：深入瞭解OECD經驗，此論文草案討論國內漁業政策改革，由我國進行漁業能力政策調整的專案報告，接受各國評論；3.國際漁業漁獲配額(附件7)：論文草案主要在評估國際漁業漁獲配額相關議題，並吸取其他資源部門經驗，由秘書處報告，與會者進行討論及導引。

四、我代表團的漁撈能力政策改革之專案報告「Policy Reform on Fishing Capacity in Chinese Taipei」，本年正式納入OECD官方文件，由秘書處安排上臺報告，由我代表團以Powerpoint 投影片作簡報。報告中芬蘭提問減船資金轉移，我代表團以答以：已儘力規範，希望相關國家通力合作，以避免漁撈能力移轉；瑞典提問總船數及總噸數減少並不意味總漁撈能力減少，我代表團答以：我國以考慮資源及配額問題，目標在總漁撈能力減少；加拿大提問我國IUU問題，我代表團答以：

我國全力阻絕IUU/FOC，惟依我方實踐經驗，其問題極爲複雜，需相關國家加強協調合作，過去已有日、美等國與我國合作之模式。

五、在與OECD漁業政策組組長Carl-Christian SCHMIDT交談中，談及未來工作計畫的主題，是否可讓我國國內學者來進行研究，渠認爲可行，而2009-2010之計畫應在2008年5月前提報計畫摘要內容，本次協同參加的國立臺灣海洋大學王冠雄副教授亦向渠表達有意申請，已獲得認同。另對OECD是否可提供長短期人員工作實習(Secondments)機會時，渠認爲目前有規劃2-6週的短期特殊議題之工作，以及長期6-12個月長期深入參與工作之實習機會，惟主要針對會員國，我國是否可提出申請，將由渠找出已實踐之案例或由秘書處來研究，會後再回復我方需求。

六、漁業全球化：1.由秘書處報告新版漁業全球化及漁業價值鏈文件，內容業納入第99屆COFI各方意見進行調整，包括全球化爲何及如何發生、政策執行的落差、跨越價值鏈的相關議題，另接受與會者進行討論及導引(附件8)。2.漁業服務國別狀況：由秘書處彙整各會員國及觀察員的「漁業服務問卷」，提出一份對應的文件，在報告後讓與會者進行討論及導引。3.出入港及港口服務國別狀況：是秘書處彙整各會員國及觀察員的問卷，提出一份有關的出入港及港口服務國別狀況文件，在報告後讓與會者進行討論及導引。4.漁業服務：問卷結果及政策意涵，這份文件是秘書處由問卷結果提報概述，並報告其政策內涵，由秘書處報告後讓與會者進行討論及導引(附件9)。5. 出入港及港口服務經濟面考量：是秘書處提出經濟面向的相關議題，作爲國家或國際架構的規範參考資訊，在報告後讓與會者進行討論及導引。

<u>10月31日</u>：

一、漁業評估：要求各代表團填報2004-2006之國別統計數據2008年版，俾秘書處能準備提報「國別漁業統計」評估報告。

二、報告與資訊：1.報告與漁業活動有關之其他OECD活動：就現有各項執行工作，由秘書處通知各代表團，有關漁業委員會與其他國際組織的互動計畫，OECD其他處室也提供漁業委員會相關調整更新的事情，除作爲資訊外，也進行討論；2.秘書處活動報告：包括秘書處人員過去及已計畫活動，當然也有參加會議部分，提供與會只作爲資訊。3.會員國報告與COFI有關的活動。4.觀察員報告：由FAO、EC及UNEP作口頭報告。

三、新會員及加強交流國家(屬會員國內部討論項目，觀察員離場)：發展對有意　加入OECD的國家及加強交流對象國的策略，由秘書處提供

更新名單，有意加入的新會員國包括俄羅斯、斯洛法尼亞、愛脫維亞、以色列及智利，並強化特定非會員國的交流。

肆、心得

一、水產品生態標籤已受到許多先進國家之重視，海洋生態保護及生物多樣化也成爲潮流，未來漁業施政有必要極早因應。適當的標示產品來源是全球化重要一環，我國在推動水產品產銷履歷政策的同時，也應在考慮在產品標示及生態標籤上預爲調整，以符合國際環保需求。

二、海洋捕撈生產無法滿足市場需求的狀況，OECD對養殖漁業仍然抱持正面樂觀態度，尤其針對開發中及未開發國家發展水產養殖極力推展，我國在養殖技術上已有良好基礎，應發揮更大角色，俾在經濟合作領域取得更多參與的籌碼。

三、在水產品全球化中，重視產品行銷及環境保育已無可避免，由價值鏈體系中可看出，生產與消費同等重要，生產面亦須兼顧海洋環境及資源保育與經濟發展兩者間之平衡，OECD長久以來揭櫫的漁業政策改革，是朝向永續發展的精神與方向，與我國現有漁業政策的優質及永續目標不謀而合。

四、出席國際會議表現積極是最重要的部分，觀察員在發言上須排在會員之後，惟主動提出個案研究報報及適時提供經驗與評論，可逐步呈現角色的重要性。我國雖因特殊國際地位較難成爲OECD會員，如能積極參與，作出實質貢獻，依然可獲得應有的支持與鼓勵。

五、中國大陸、南非、印度及巴西等國是OECD有意加強交流對象，未來中國大陸之因素對我國目前「一般觀察員」身份是否有影響，尚無法評估；惟目前部分OECD文件已將國家(「STATE」或「COUNTRY」)改稱經濟體(「ECONOMY」)，南韓代表團MR. KOO也向本團特別提醒該項轉變，未來建議比照APEC模式加強合作關係，主動出擊及積極參與將是重要課題。

六、我國漁業部門雖僅是OECD漁業委員會爲期2年之一般觀察員，卻能積極派員參與，已受到OECD正面評價；未來更應推動各部會間協調整合機制，並結合學界及產業界力量，利用OECD平台，加強與各國漁業經貿及漁業政策改革議題之合作。

七、全球化之發展及國際水產品需求升高，是機會也是一項挑戰，提高產品品質及安全衛生將競爭優勢的利器。ＷＴＯ(世界貿易組織)談判和各國經

濟夥伴協定(ＥＰＡ)協商等受到極大的重視，包括降低漁業補貼及關稅減免，皆是因應貿易自由化和經濟社會國際化的一環，我國水產業也需體認產業優質才能永續。

八、漁產新鮮及加工品皆在全球市場有極大潛力，確保水產品安全及消費者信心極為重要，因此強化食品安全與產銷履歷制度已無可避免。為生產符合國內外消費者需求，我國應落實生產到加工流通各階段的衛生、品質管理，活用產銷履歷系統，另須將水產品營養特性和安全性等資訊充分提供給消費者，以符合水產品消費市場需求。

九、各國皆重視漁業政策改革，每年皆有不同的主題在OECD COFI中被提出討論，由本年的漁撈能力到明年的國際漁業配額分配議題，皆是我國面臨最大課題。資源永續利用需由資源、船隊管控着手，除了強化資源管理措施、統計體制、科學研究外，與國際漁業組織協調合作，建構永續利用管理機制，在有限配額發揮最大效用，營造經營合理化及資源利用最佳化的模式。

十、海洋生態保育與環境保護一直為OECD COFI的重要議題，本次年會討論生態為基礎的漁業、氣候變遷與漁業及生態標籤等，未來應投入更多資源進行專案研究及政策推廣。另外推動經濟有效之國際漁業管理、監控及評估漁業、漁業作業改革，也是我國長期以來積極進行的施政項目，未來有必要與其他國家共同合作，參與及分享經驗與成果。

伍、建議事項

一、「漁業」是我國少數幾個得以「一般觀察員」(期限至2008年11月)身分參與OECD年會的部門，建議由本署持續與OECD漁業小組保持密切聯繫外，並積極派員出席相關會議；我方以「觀察員」身分參與年會，在評論或討論上需排在會員國之後，建議利用每次個案研究報告機會取得主導權，在先報告後再接受評論或討論方式，以增加曝光率。

二、OECD的COFI每次年會皆會針對一個漁業政策改革主題要求各國在會前提出，經秘書處彙整分析整體狀況後，要求少數具代表性國家上臺專題報告，我國已連續兩屆提報漁業政策成果，受到正面之肯定。OECD將於明(97)年4月主辦第101屆COFI，以「國際漁業之配額分配」作為個案研究主題，我國是該主題重要的主事國，建議及早核派人選，並積極蒐集參與評論，以分享經驗；另建議由本署定期配合OECD填報相關資料，以增加在國際上之能見度，並強化與OECD合作互動。

三、有關OECD與本會共同主辦之國際農業政策改革研討會部分，在與OECD漁業政策組組長Carl-Christian SCHMIDT洽談餐敘事宜，並談及該研討會在中共壓力下取消極爲可惜，主要是因爲目前中國大陸雖尚未申請爲會員國，卻是目前OECD重點合作國家之一，故而OECD副秘書長認爲不妥而要求貿易及農業處取消五名官員來臺計畫；另渠亦表示由於派遣人數過多，加上我方透過APEC會員國進行邀請，引起中國大陸關切；而渠認爲此非通案，表達未來仍願意協助我方辦理相關國際研討會。爲利於未來主辦類似研討會，建議適度調整邀請對象，使會議得以圓滿召開。

四、OECD會員多爲先進國家，參加人員亦參與聯合國糧農組織(FAO)、世界貿易組織(WTO)、大西洋鮪類保育委員會(ICCAT)、印度洋鮪類保育委員會(IOTC)、中西太平洋漁業委員會(WCPFC)、美洲熱帶鮪類組織(IATTC)、南方黑鮪保育委員會(CCSBT)等國際組織會議，相關的漁業管理議題可進行溝通協商，因此，建議我方可在美、日、歐盟外，加強與英、加、紐、澳等國的諮商交流與互動，使我方意見能充分反映，以獲取日後更強而有力之支持。

五、生態系爲基礎之管理、生態標籤及水產養殖將是未來兩年的重要研究主題，未來建請在專案計畫可配合進行研究，並俟機與COFI合作專案研究計畫或合辦相關研討會，以共同關切議題活絡關係，並促進與相關國家的互動，營造有利於參與國際社會的條件。

六、中國大陸漁撈業與水產養殖生產量已占世界最大比重，其地位日益重要，本次OECD將該國及南非、印度及巴西列爲積極爭取合作對象，可見影響力已日益增加；爲了避免受到中國大陸排我之影響，建議我駐外單位及本署密切注意今後之發展，並積極投入相關會議活動，以確保我國參與的權益。

七、OECD COFI對於漁業相關個案研究投入極大心力，未來建議我方應透過學者專家與該委員會加強合作，進行生態系爲基礎之管理、推動經濟有效之國際漁業管理、不作爲成本-延遲漁業作業改革之成本、政府財政移轉、水產養殖：與捕撈業之政策挑戰與互動、至2015年重建漁業資源、氣候變遷與漁業及生態標籤等重要主題研究，確立互助模式；另外對OECD提供長短期人員工作實習(Secondments)機會，目前規劃之2-6週的短期特殊議題之工作，以及長期6-12個月長期深入參與工作之實習機會，雖主要提供會員國，建議我國仍可透過已實踐之案例，讓我方人員有在國際組織實習及磨練的機會。

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附件2　個案研究報告(Policy Reform on Fishing Capacity in Chinese Taipei)

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Organisation de Coopération et de Développement Economiques
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TRADE AND AGRICULTURE DIRECTORATE
FISHERIES COMMITTEE

Cancels & replaces the same document of 16 October 2007

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POLICY REFORM ON FISHING CAPACITY IN CHINESE TAIPEI

This document was submitted by the Delegation of Chinese Taipei for INFORMATION to the 100th Session of the Committee for Fisheries, 29-31 October 2007, under item 8. 2).

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POLICY REFORM ON FISHING CAPACITY
IN CHINESE TAIPEI[1]

1. Introduction

1. It is now widely recognized that as a responsible nation shall utilize the marine resources in a sustainable manner. United Nations Food and Agriculture Organization (FAO) statistics show that the world's catch production has reached a plateau of 89-97 million tons with not much of a change over the last ten years. It also reported in 2000 that an estimated 25% of the fish stocks are globally under or moderately exploited, 50% of stocks are fully exploited, 15% are over exploited and about 10% have been depleted or are recovering from depletion. There has been a continuous growth in the global catch of major tuna species since 1957, and most tuna stocks are either close to full exploitation and some even in the status of over-exploitation. To address these issues, it is crucial to impose policy reform so as to reduce fishing capacity at the national and international frameworks.

2. The process of reform in fishing sector has been a continuous feature of policy in Chinese Taipei (CT) for several decades. Not only in response to FAO adopted International Plan of Action for Management of Fishing Capacity calling upon related States to reduce their large-scale tuna long-line fleet (more than 100 gross registered tonnage) by 20-30% to ensure the sustainability of marine resources, but also to the number of codes, agreements, resolutions and recommendations on reducing fishing capacity at the international level. All such moves had sent an important signal to nationals about the seriousness with which we treat our fisheries resources. Under the situation, and also to deal with over capacity on inshore fishery, CT has to do much more to correspond so that can meet the calls for requirements of international conservation and domestic management needs. Hence we have implemented some vessel reduction program and measures to tackle, aimed at structural adjustment to achieve economic efficiency and improve resource use.

2. Framework

3. Chinese Taipei production in capture fishery has reached to the top 20th in the world, but the government has often faced hard policy dilemmas when trying to guide the sector toward a more sustainable way due to adverse impact on industry. Our distant water (deep-sea) fishery was booming since late 1980s, including tuna fishery, squid jigging fishery and saury torch-light fishery, have been played a key role in the global fisheries and earned much more foreign exchange from international market. At present, our deep-sea fishery production reached 757 896 MT in 2006 and operated 435 vessels of large-scale long-line, 34 vessels of Purse-Seine for tuna and 110 vessels of squid jigging with torch-light operation, they are not easy to control and monitor for their mobility characteristics.

4. Declining fish stock and expanding fishing scale have combined with market needs to put increased pressure both on deep-sea and Inshore fishery of Chinese Taipei. On the contrary to deep-sea fishery, inshore fishery which has stagnant production at all times, they can be divided into two groups on

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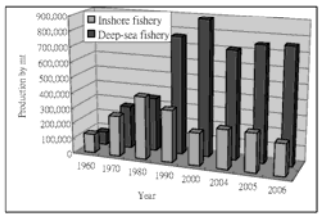
the basis of EEZ and territorial water as offshore and coastal fishery which production were about 209 245 MT in 2006, and operated some 12 287 boats of under 100 tonnages and 12 456 fishing rafts. Deep-sea fishery produced lesser than inshore did before 1980, but appeared quite the other way after 1990 which is provided in Figure 1, where both have faced over-capacity problem while inshore fishery has produced less but played an important role in social and political economy.

Figure 1. Deep-Sea and Inshore Fishery Production in Chinese Taipei



Source: Fisheries Statistical Yearbook in Taiwan Area

5. In recent years, Chinese Taipei has reformed fishing sector by squeezing capacity and imposing MCS approaches. There are eight forms of adjustment:

- Blocked fishing permission,
- Mandatory vessels decommissions,
- Boat and raft buy-back program,
- Retention of the right of building fishing boats,
- Voluntary fishing suspense,
- Appointed fishing suspense,
- Draft regulation and enforcement,
- Relevant measures.

6. To control our fishing capacity, we have generally enforced limited entry system since 1989. For building a new fishing vessel under Chinese Taipei's flag, decommissioning equal tonnage of fishing vessels of the same fishery in advance is required. The policy of replacement of decommissioned vessels was first introduced in 1967, applying in the first stage to the restriction on the building new trawling vessels. Up to 2000, a total of 9 such policies were announced, with the exception of building of fish transport vessels of 2 000 tons or larger in 1991, and the policy of limited entry has been implemented in its entirely.

7. In addition to strengthening of fisheries management, Chinese Taipei's past measures on the conservation of marine resources include: restriction on the total number of vessels and the total tonnage in the fleet and the total number of large-scale fishing vessels, retention of the right of building of new vessels by the government upon exportation of old ones. As from March 2007, building of new vessels is not permitted after exportation of an old one. Therefore, the total number of motorized vessels and their total tonnage has been controlled at a suitable level and there will be no further increased.

8. In addition, when its flagged long-liner has been exported, the original owner will not be entitled to build a replacement vessel to avoid the expansion of the global fishing capacity. After the completion of the fleet mandatory reduction program cut tuna long-liner in 2005, 2006 and 2007. We also devoted to buyback trawler over 100 tonnages and long-liner between 20 and 100 tonnages so as to decrease fishing effort and catch.

9. In order to prevent expansion of fishing capacity resulted from exportation of foreign-flagged fishing vessels, we have enacted a regulation on June 29, 2005 to prohibit exportation of any tuna vessels built in Chinese Taipei except for replacement of a sunk or scrapped fishing vessel of equivalent capacity on the positive lists of RFMO's. For being consistent with the resolutions adopted by the RFMO's, a holistic approach with several stringent measures has been taken by the fisheries agency of Chinese Taipei, including management of catch transshipment at-sea, implementation of special management law for governing the investment activities of our nationals in foreign countries in terms of fishing vessel and fishing activity.

10. For ensuring efficiency of policy reform on fishing capacity, our fishery adjustments have involved some MCS approaches to help achieve the objective. These measures included:

VMS requirement

11. We have already met by all tuna long-line and purse-seine vessels greater than 100 GRT in weight to install VMS which can daily monitor the vessel position. We also hold in line with the RFMO's reporting procedure to report our data for catches and effort correctly.

Boarding and port inspection and port control

12. In maintaining the fruitful results of fisheries adjustment, we have increased the frequency of port inspection and dispatch patrol boats to distant water which boarding and inspection to verify other measures implemented correctly.

Efforts to control IUU fishing

13. Chinese Taipei has drafted the legislation to combat IUU fishing, and also cooperated with market states trying to find out any vessel suspicious of such activities. Such list will be submitted to the competent authority for further investigation.

Port sampling and scientific data collecting

14. Port sampling provides scientific data for stock evaluation which benefits resource management. Chinese Taipei has made every effort to do it. Scientific data will be reviewed where necessary and submitted in accordance with international rules. We also install e-logbook system that can transmit the dynamic fishing data for further analysis on fish stocks.

Outcomes

15. As one of major fishing nations around the world and a key player in several RFMOs, CT is willing to devote itself as much as possible for the development of global fisheries community and in line with the international standards no matter what fishing sector is. Our inshore fishery operated a large number of fishing boat which most of them are belong to small-scale fishery and subsistent fishermen. Thus, government concerns should be focused on the impact of adjustment on fishermen and fishing communities that made cutting fishing capacity extremely difficult. We have still implemented entrance and effort control as freezing license, buyback approvals, limits gear/sea/ground, TAC setting and related management measures, but buyback and decommission mechanism are more effective and efficiency to avoid irreconcilable conflict.

16. Capacity reduction can contribute to achieve more suitable production. From decommission and buyback programs, Chinese Taipei decommissioned standing 160 large-scale long-liner, all of which totally invested the funds of over TWD 3 500 million. Another large-scale long-liner reduction of 23 vessels shall be dealt in 2007. Along inshore fishery, we purchased 200 fishing boats and 650 rafts over the past five years, has rewarded over 53 000 fishing boats of fishing suspense, invested the funds of over TWD 1 100 million. Figure 1 illustrates a decline in Deep-sea fishery production between 2004 and 2006 for the vessel reduction, but had a stable situation in inshore fishery production for scale limitation. It was obvious that reduction program significantly benefits decreasing production on large-scale vessels.

17. In considering the adjustment of fishing capacity, Chinese Taipei has taken some measures based on pursuing policy reform. Table 1 shows that we possessed only 101 large-scale fishing vessels in 1960 while increased peaked at 1 786 vessels in 1990 then decreased by reduction program, held 5 440 small-scale fishing boats less than 100 GRT in 1960 while maintained the number about 13 000 after 1980 and the number of fishing raft kept on decreasing gradually to 12 090. The table gives further indication of the scale of change experienced by the different class of fishing boat in past several decades.

Table 1. Numbers of Powered Craft by Tonnage in Chinese Taipei

Year	Number of < 20 tonnage	Number of 20~100 tonnage	Number of > 100 tonnage	total tons of fishing boat	Number of fishing raft
1960	4 736	704	101	78 343	16 587
1970	8 341	1 442	732	249 444	10 663
1980	9 448	3 304	1 149	476 480	13 982
1990	**9 615**	**4 305**	**1 786**	**968 473**	**16 785**
2000	8 350	3 214	1 301	812 154	13 302
2004	9 081	3 194	1 252	827 188	12 984
2005	9 041	3 214	1 215	807 387	12 630
2006	9 053	3 234	1 099	743 765	12 456

Source: Fisheries Statistical Yearbook in Taiwan Area, 2006.

18. Chinese Taipei seeks optimum harvesting system and focuses on elimination over capacity to meet policy reform. We have adopted management measures to make the policy keep going, observer coverage shall be a typical one which have grown very fast these years and will be enhanced in near future. The total number of large-scale tuna long-liners in Chinese Taipei reduced from 614 to 412 these three years. Moreover, implementation of vessel buyback program respectively, Chinese Taipei has reduced the total number of fishing vessels, boats and raft which is shown in Table 2, with a reduction of approximately 20% of the entire fleet, and in term of vessel tonnage, a reduction from 968 000 tonnages to

830 000 tonnages or a 10% reduction. All of those programmes and measures would like to meet the objective of reforming domestic fishing industry, also to urge a 20% reduction of the world's total large-scale tuna long-liners, securing the sustainability of fisheries.

Table 2. The Number of Fishing Vessels Reduced from Vessel Reduction Programme in Recent Years in Chinese Taipei

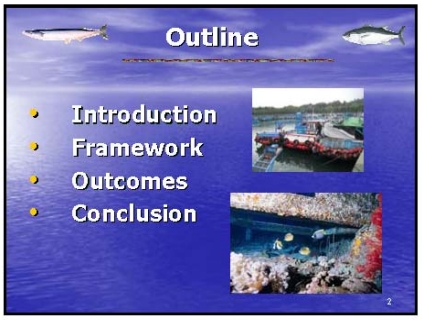
	1991-1995	1996-2004	2005	2006	2007	Total
Large-scale Long liner	0	0	59	101	23	183
Small-scale Long-liner	0	0	0	0	100	100
Large-scale Trawler	0	4	1	2	59	66
Others vessels	2 337	432	12	0	NA*	2 781
Fishing raft	0	0	93	259	298	650

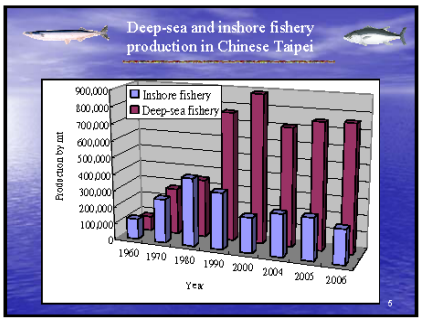
Source: Fisheries Agency of Chinese Taipei
*Not available

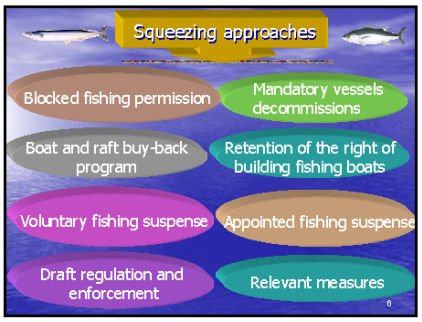
Conclusion

19. Appropriate policy and regulatory instruments are necessary to achieve multi-function objective, Chinese Taipei will do its best efforts in holistic ways to control fishing capacity in favor of resource conservation and sustainability. Fisheries policy reform which under the way is a fishery development process, not only large-scale fleet size reduction program implemented, but also suitable scale shall be totally built up. It is expected that the total number of large-scale tuna long-liners in Chinese Taipei will be reduced and also restructure the entirely catch sector. This meets the objective of FAO IPOA-fishing Capacity urging a 20% reduction of the world's total large-scale tuna long-liners and help to reduce domestic inshore fishing capacity. It is also in line with the international trend of enhancing fisheries management and conservation of marine resources for achieving the objectives of "assuming the responsibility of resources conservation" and "commensuration of the size of fishing fleet with the available of fishing opportunities".

附件3　　投影片簡報(Powerpoint)







1

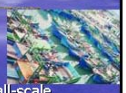
Design

- Limited entry system since 1989.
- Restriction on the total number of vessels and the total tonnage in the fleet.
- Restriction on the total number of large-scale fishing vessels.
- Retention of the right of building of new vessels.
- Exported no build new one.
- Mandatory reduction program cut tuna long-liner in 2005, 2006 and 2007.
- Buyback trawler over 100 tonnages and long-liner between 20 and 100 tonnages.

Ensuring efficiency of policy reform on fishing capacity

- prevent exportation of foreign-flagged fishing vessels.
- Enacted a regulation except for replacement of a sunk or scrapped fishing vessel.
- Management of catch transshipment at-sea, implementation of special management law.
- Several stringent measures :
  - VMS requirement.
  - Boarding and inspection, and port control.
  - Efforts to control IUU fishing.
  - Port sampling and scientific data collecting.

Outcomes



- International standards.
- Inshore fishery belong to small-scale fishery and subsistent fishermen.
- Entrance and effort control as freezing license, buyback approvals, limits gear/sea/ground, TAC setting and related management measures.
- Buyback and decommission play key roles.

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Decommission and buyback

- Decommissioned standing 160 large-scale long-liner invested over 3,500 million NT$.
- Another 23 vessels shall be dealt in 2007.
- 200 fishing boats and 650 rafts over the past five years.
- 33,000 fishing boats of fishing suspense.
- Decline in Deep-sea fishery production between 2004 and 2006 for the vessel reduction.
- Reduction program significantly benefits decreasing production on large-scale vessels.

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Numbers of Powered boats by Tonnage

YEAR	Number of < 20 tonnage	Number of 20~100 tonnage	Number of > 100 tonnage	total tons of fishing boat	Number of fishing raft
1960	4,736	704	101	78,343	16,587
1970	8,341	1,442	732	249,444	10,663
1980	9,448	3,304	1,149	476,480	13,982
1990	**9,615**	**4,305**	**1,786**	**968,473**	**16,785**
2000	8,350	3,214	1,301	812,154	13,302
2004	9,081	3,194	1,252	827,188	12,984
2005	9,041	3,214	1,215	807,387	12,630
2006	9,053	3,234	1,099	743,765	12,456

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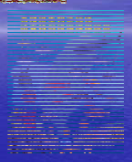
optimum harvesting system



- Management measures include observer coverage etc.
- Large-scale tuna long-liners in CT reduced from 614 to 421.
- Reduction 20% entire fleet.
- 968,000 tonnages to 830,000 tonnages.
- Securing the sustainability.

The number reduced

	1991-1995	1996-2004	2005	2006	2007	Total
Large-scale Long-liner	0	0	59	101	23	183
Small-scale Long-liner	0	0	0	0	0	0
Large-scale Trawler	0	4	1	2	0	7
Others vessels	2,337	432	12	0	NA*	2,781
Fishing raft	0	0	93	259	298	650

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Conclusion

- Appropriate policy and regulatory instruments.
- Holistic ways to control fishing capacity.
- Large-scale fleet size reduction program and suitable scale .
- Restructure the entirely catch sector.
- FAO IPOA-fishing Capacity 20% reduction.
- Reduce domestic inshore fishing capacity.
- International trend and requirements.

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18-Oct-2007

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TRADE AND AGRICULTURE DIRECTORATE
FISHERIES COMMITTEE

TAD/FI(2007)2/REV
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MANDATE RENEWAL OF THE COMMITTEE FOR FISHERIES STRATEGIC VISION AND MANDATE

REVISION

This is a revised version of document TAD/FI(2007)2 presented for DISCUSSION and GUIDANCE to the 100th Session of the Committee for Fisheries, 29-31 October 2007 under item 3.

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JT03234280

English - Or. English

REVISED VERSION OF THE STRATEGIC VISION AND MANDATE OF THE COMMITTEE FOR FISHERIES

Explanatory Note by Lori Ridgeway

1. As noted in the Summary record of the 99th session, delegates asked that the next and hopefully final version of the mandate renewal document for the 100th session address the following:

- the need to reduce the length of the document, in particular by consolidating and focussing the preamble;
- work towards a briefer vision statement that was more high level and aspirational
- recognition of the important role of economic efficiency in the mandate of the committee
- include broad performance indicators in the monitoring section; and
- re-examine the section on communications strategy with a view to making it more concise.

2. Delegates were also requested to provide written comments elaborating on these points, including draft suggestions, by May 30. This would have been especially important in delineating more clearly what was meant by terms such as "aspirational" wording and to give examples of performance indicators.

3. In the event, only the EU provided brief written comments either by the deadline or thereafter, which have been accounted for in this revision. Neither the issue of the "aspirational" aspect of the Vision, nor illustrative generic performance measures have been elaborated by Delegates.

4. In this light, and especially in light of the balance of desire of the Committee for a final version that would not open new debates, the following changes have been made:

Preamble

5. The majority of comments offered in Committee discussions focussed on the length and detail of both the preambular section and the section on Communications.

6. The preamble has been shortened considerably, by dropping reference to some issues, merging others, and adding one additional aspect that seemed to have been overlooked but core to the challenges of managing fisheries in relation to other economic sectors (in relation to regulation, cooperation and alignment of incentives). In addition, diverse references requested by members (such as increased reference to economic efficiency, the need to recover depleted stocks, etc) have been incorporated.

7. Thus this section has been reduced by half and focuses on key contextual points of:

- role and strength of economics and the benchmark of economic efficiency in the Committee's work and its role in issues of fisheries sustainability;

- linking fisheries sustainability to economic and social outcomes (SD) -- and also by implication the OECD's overall Mission – and, in this light, the need to address both overfishing and depletion as well as new threats;
- extensive linkages of fisheries to other issues, (many of which are economic flows) which influence the way opportunities and risks are managed
- balance of both regulation and incentives in managing common property resource
- the fact that the Committee's work has to nest in other issues and players in and outside the OECD
- reference to globalization and global flows and effects of our policies on non –members
- the need for the Committee to scan and stay flexible to emerging issues (and thus not be "locked" into a mandate that describes issues, rather than activities)

Vision

8. The Vision statement has been shortened, simplified and a request for references to efficiency by one delegation was added. As the issue of "aspirational" language was not elaborated or interpreted in follow-up comments, the goal – which is far from the current situation of fisheries – is left to speak for itself.

9. As noted in the Committee discussion, the Vision and Mission have not been merged, as may have been implied by the comments of one delegation, as the Vision relates to fisheries of the future – many aspects of which are outside the accountability of the Committee – whereas the aspirational or grounding Mission of the Committee, is something that can be delivered by delivery of the Committee's mandate. The Committee would be expected to examine its progress in delivering on its Mission.

Objectives

10. No comments were made on this section in the Committee discussion nor afterwards, other than a request to drop a reference to "guidelines". Nevertheless, in addition to this adjustment, other wording has been shortened and streamlined, where wording could have been seen as redundant.

Mandate

11. Other than a request to remove references to guidelines, no other comments on this section were made in committee discussion or in writing. Nevertheless, other minor adjustments and improvements have been made made, including removing the reference to "biennial" planning (as this dates the text) in favour of a reference to OECD planning parameters (which could, indeed, change).

Communications Strategy

12. This section, in addition to the preamble, attracted the most Committee discussion. Comments asked that this be shortened and possibly integrated elsewhere, although there was also opposing support for this section expressed, especially from the Chateau in an earlier version. Therefore the section has been eliminated as a separate component, and has been incorporated simply into one aspect of the mandate in a single sentence, with all detail suppressed. That supporting detail has been moved to an Annex in respect of those who found this section useful, giving the flexibility to the Committee to keep as an Annex or drop it. Again it is noted that comments from Chateau indicated that this section was innovative and useful.

Monitoring

13. The record makes reference to a possibility of generic performance measures in this section, following a mention in Committee discussions, but the request was not illustrated in follow-up written suggestions.

14. Thus in an effort both not to open up another long debate on a substantive issue, and in light of a Committee preference for less detail, the reference was simply made to the need for their development, as appropriate, to monitoring activities.

DRAFT MANDATE FOR THE COMMITTEE FOR FISHERIES

1. Preamble

The activities of the Committee are guided by the following context, which describes the environment in which the mandate of the Committee is anchored:

- The strength of the OECD in economic analysis, and its emphasis on economic efficiency as an important benchmark for analysis of domestic and international policy questions and options, including to ensure fisheries sustainability;
- The importance of fisheries sustainability and healthy marine ecosystems to economic and social wellbeing, and the need to both ensure recovery of stocks that are already depleted or over fished and address emerging threats to sustainability;
- The interconnectedness of the fisheries sector with other sectors and the international economy (i.e., through trade, investment, services, labour, technology and environmental policies), and the implications of these linkages for managing opportunities and risks for fisheries;
- The special role for efficient and effective public regulation and international cooperation to sustain a common property resource such as fisheries, complemented by the role of market-based approaches and responsible trade in aligning incentives coherently;
- Due regard to the mandate of other OECD committees whose work has implications for fisheries, cross-cutting OECD issues, and other international bodies addressing fishery-related issues, and the specific strength of the Committee in economic and policy analysis in complementing this work;
- The special and diverse challenges to fisheries posed by emerging issues such as globalization and responsible trade -- including the need for policy coherence in helping address the needs and aspirations of non-OECD members; and
- The dynamic nature of both the fisheries and OECD-wide policy agenda, and the need for the Committee to be alert, and able to respond, to new developments and policy priorities affecting its work.

2. Vision

The Committee's vision for global fisheries of the future is:

> *Well-managed, efficient and resilient fisheries that contribute to healthy oceans ecosystems while supporting sustainable livelihoods and communities, as well as responsible trade and consumption.*

3. Mission Statement of the Committee for Fisheries

High quality economic analysis, policy advice and an understanding of best practice, to enable wise management, good governance and sound commercial arrangements of fisheries.

4. Objectives of the Committee

The Committee will make its contribution to OECD members and non-members relating to fisheries in three distinct ways:

- Supporting and promoting improved *domestic policy development,* based on analysis of options, tradeoffs, implications and lessons from best practice in the provision of recommendations to improve domestic policy performance;
- Support the *international policy debate*, with emphasis on addressing emerging issues and contributing to improved analytical foundations of international policy discussions; and
- Supporting *OECD priorities and debate*, especially from the point of view of: implications for a common property and natural renewable resource; a sector that exemplifies the challenges of sustainable development/sustainable use; and a sector that supports often marginalized communities in dependent regions.

5. Mandate

The Committees mission and objectives will be delivered through the following mandate, which will frame the development and delivery of a program of work and budget consistent with OECD planning parameters, and which addresses current and emerging issues in the fisheries sector:

- *Collection, integration, assessment and dissemination* of key national and international fisheries statistics and information relevant to economic and policy analysis;
- *Monitoring* of current and emerging OECD and global trends, issues and policy developments relevant to the fisheries sector, with a view to identifying policy issues benefiting from in-depth analysis at the OECD;
- *In-depth analysis* of key current and emerging fisheries-related economic and policy issues, to better understand their nature and identify possible remedies at both the domestic and global level;
- *Policy dialogue* to explore benefits and costs of policy options, promote lessons learned from across OECD members, seek agreement on policy principles and recommend ways forward to improve the sustainability and efficiency of the fisheries sector;
- Development of *policy advice, recommendations and best practice dissemination* to help inform OECD members and non-members regarding domestic and international fisheries issues;
- *Outreach activities* that will demonstrate openness to diverse views in informing the Committee's activities, transparency about committee activities, broaden the knowledge base for OECD members and non-members, and maximize the policy impact of the Committee's work; and

- A *proactive communications strategy* to ensure the widespread dissemination and maximum and long-lasting influence of the Committee's work among OECD members, non-members, within the OECD Secretariat, and in other relevant international bodies (See Annex 1).

6. Monitoring

The Committee will periodically and as appropriate, review its work, working methods and outcomes using, as appropriate and feasible, generic performance measures. These will be assessed in relation to its Strategic vision, and delivery of its mandate and objectives, as enumerated in the Programme of Work and Budget. The Committee will report to the Organization as required.

As in-depth reviews occur in the future, the Committee will provide advice on the best performance measures to assess diverse activities that have been undertaken. The Committee will review its mandate on a regular basis in light of emerging developments and issues.

Annex 1. Possible Elements of a Communications Strategy

Communication Strategy

A comprehensive communication strategy is essential to ensure the widespread dissemination and maximum influence of the Committee's work among OECD members and non-members, within the OECD, and in other international bodies. This will be achieved by:

- Making optimal use of OECD communication tools, including the OECD Fisheries website, publications, policy briefs, flyers and articles;
- Highlighting the policy relevance of the Committee's work through the use of well-focused, policy-relevant executive summaries;
- Maximising opportunities to directly inform and engage in on-going domestic and international debate including, where appropriate, in other international organizations (e.g., WTO and FAO);
- Appropriate timing and targeting of communication activities to maximize the policy impact of the Committee's work; and
- Engaging national and international media coverage of the Committee's work.

Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

13-Sep-2007

English - Or. English

TRADE AND AGRICULTURE DIRECTORATE
FISHERIES COMMITTEE

TAD/FI(2007)10
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SUGGESTIONS OF THEMES FOR THE PROGRAMME OF WORK 2009-2010

This document is submitted for DISCUSSION and GUIDANCE to the 100th Session of the Committee for Fisheries, 29-31 October 2007, under item 5.

Delegates' attention is drawn to paragraph 2 requesting that any additional proposals for themes to be considered should be sent to the Secretariat by 1st October 2007.

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JT03231931

English - Or. English

SUGGESTIONS OF THEMES FOR THE PROGRAMME OF WORK 2009-2010

1. Introduction

1. The purpose of this document is to start the process of developing the Committee for Fisheries' Programme of Work (PoW) for the 2009-2010 biennium. While it may seem relatively early to start this process, Delegates are reminded that long lead times are required to prepare the OECD Biennial Programme of Work and Budget. However, firm commitments on projects and outputs for 2009-2010 will be required by May 2008 when the Organisation considers its PoW and Budget for 2009-2010. To this end, this document is presented to the 100th Session of the Committee and is intended to assist the Committee to refine the broad areas in which it will undertake work in the next PoW.

2. The document begins by recalling the recent work that the Committee has undertaken in the past two PoWs, then presents a range of possible themes that the Committee may wish to address in its 2009-2010 PoW. The themes have been developed by the Secretariat based on discussions at recent Meetings of the Committee for fisheries, conferences, meetings in other international organisations, and media reports. Delegates may wish to add additional themes to those suggested by the Secretariat. These should be submitted in writing prior to the 100th Session (**by 1 October 2007**) in order that they can be disseminated to the Committee well in advance of the meeting to allow Delegates time to reflect on the merit of the proposed themes.

3. It is also important to note that the development of this document has benefited from the work that the Committee's Ad Hoc Mandate Renewal Group has undertaken in advancing towards a new mandate for the Committee. The possible themes for future work presented in this document have been developed with due regard to the three objectives of the Committee identified in the draft mandate (see TAD/FI(2007)2):

- support and promote domestic policy developments;
- support the international policy debate; and
- support OECD priorities and debate.

2. Recent Work of the Committee for Fisheries

4. In addition to ongoing monitoring of policy developments and collection of statistics that is carried out through the Review of Fisheries, the Committee for Fisheries has worked on the following specific topics in the past two PoWs.

2003-05

- Environmental, Economic and Social Issues of and IUU Fishing (including a workshop),
- Using Markets Mechanisms to Manage Fisheries, and
- Financial Support to the Fishing Industry: Implications for Sustainable Development.

5. In addition the Committee undertook work on the horizontal project on Policy Coherence for Development through hosting a workshop jointly with the Development Assistance Committee. The Committee also undertook a minor project on foreign direct investments in fisheries which culminated in a special chapter for the Review of Fisheries.

2006-08

- Political Economy of Fisheries Reform and Challenges (including a technical meeting on the social aspects of fisheries reform);

- Opportunities and Challenges of Fisheries Globalisation (including a major workshop undertaken jointly with FAO).

3. Possible Themes for the 2009-2010 Programme of Work

6. A wide range of policy issues figure prominently on the international and national fisheries policy agendas. In numerous fora, discussions are on-going on these issues but, as has been observed in the past, little attention is generally given to the economic dimension of the issues at stake. The role of the OECD Committee for Fisheries is to provide that economic dimension in a multilateral setting and to bridge the gap between the different perspectives of the policy debates on the basis of sound economic analysis. At the same time, it is important to recall the relatively small resources available to the OECD for fisheries work at this stage. This makes it imperative that, when considering to which themes scarce resources should be devoted, Delegates endeavour to focus on those areas where the potential pay-off, in terms of policy impact, is highest.

7. As noted in the introduction, the following eight themes have been developed by the Secretariat. The order in which they are presented here does not reflect any particular preferences or priority. In discussing the suggested themes, Delegates are also reminded that some of the work could benefit from the hosting of workshops or technical meetings. Experience from the last two PoW periods has demonstrated that such events can contribute to and accelerate the Committee's (and the Secretariat's) thinking on a given issue. Concurrently, the same events serve the purpose of reaching out to new players in the fisheries field and, more generally, provide the Committee's work with more exposure. Additional themes from Delegates will be issued in a companion document and are to be considered concurrently. The Committee is reminded that, as in previous PoWs only a limited number of themes can be covered (possibly 2 substantive themes in addition to the Review of Fisheries). Hence, when discussing the themes an indication of priority is needed.

Theme 1: Ecosystem-based management.

8. Over the past decade, there have been increasing calls for a move towards ecosystem management approaches in fisheries. At a high level, ecosystem management is a holistic management approach to marine resources management. In the FAO Guidelines for Responsible Fisheries No. 4 the management approach is defined as "*An Ecosystem Approach to Fisheries strives to balance diverse societal objectives, by taking account of the knowledge and uncertainties about biotic, abiotic and human components of ecosystems and their interactions and applying an integrated approach to fisheries within ecologically meaningful boundaries*." The Committee could fruitfully undertake work on the ecosystem approach in particular in advancing the understanding of how to incorporate economics into the approach and more generally by comparing, across the OECD countries, how national administrations have incorporated the approach into their fisheries management practices through presentation of case studies. In this regard it is worth recalling that the WSSD Plan of Implementation encourages the application by 2010 of the ecosystem approach.

Theme 2: Promoting economic efficient international governance in fisheries.

9. The work of the COFI could help to better define and implement fisheries management arrangements for international shared fish stocks. Priority policy issues include allocation mechanisms for high seas fish stocks, transferability of such rights, the openness of regional fisheries management arrangements and, more generally, the problems associated with illegal, unreported and unregulated fisheries. Port access, conditions for unloading and transferring fish catches have been flagged by the Committee as important issues in its work on access to port services; some additional work in this area may be useful to consider if more work on IUU fishing is warranted. The economic analysis of the OECD's Committee for Fisheries can assist policy makers in formulating new management approaches for international fisheries.

Theme 3: Costs of inaction -- costs of delaying fisheries policy reform.

10. The work on the political economy of reform in the present work programme has highlighted many of the difficulties involved in reforming domestic fisheries management arrangements. Building on this work and on the broader work of the Environmental Policy Committee on the Cost of Inaction (ENV/EPOC(2007)REV1), the Committee could usefully explore the economics of no change in policy direction. No work is available that has quantified the economics for societies in delaying fisheries reform despite the potential for future augmented income and rent streams if fish stocks are rebuild. Highlighting the economics of action versus no action can provide policy makers with a scheme model for how to assess monetary values of policy reforms.

Theme 4: Monitoring and evaluation of key trends and issues in fisheries, including government financial transfers.

11. Ministers meeting in the OECD in 2007 MCM called on "*the OECD to intensify its work on the political economy of reform and increase its support to government in their reform efforts*".[1] While the Review of Fisheries has taken on a life of its own, it remains that **there is still room for using that particular monitoring process in a more active way with a view to assess fisheries reform progress**. The latest Review has been changed considerably and could, with some additional efforts by both Delegates and the Secretariat, become a major tool and help in assisting Member countries in their reform efforts towards sustainable and responsible fisheries. The positive reception of the Mexico country study indicates that there may be an appetite for similar reviews of a country's (or a group of countries) fisheries policies. It would be useful for Delegates to have a discussion of the modality to move towards a "monitoring and evaluation" of fisheries policies with a view to use the Committee for Fisheries as an active "policy advice forum" for policy reform.

Theme 5: Aquaculture: policy challenges and interactions with capture fisheries.

12. The recent Workshop on Fisheries Globalisation highlighted that the aquaculture sector is thriving and will be a major supplier of fish in the future. However the sector also has its own problems and policy challenges to deal with. The Committee may wish to consider certain aspects of aquaculture (e.g. interaction of wild vs. farmed fish) as being worthy of detailed analysis. A key economic challenge is to gauge the extent to which the capture fisheries sector is impacted by increasing production from aquaculture. Increasing production from aquaculture may have implications for the price level of capture fish and hence on income levels of fishers and fishing communities. More generally the place of capture fisheries in the broader food economy and the interactions between fish and alternative food available to the consumers has not been subject to economic analysis. It may be possible, with the assistance of the

[1] C/MIN(2007)6 paragraph 29

Co-operative Research Programme, that a Workshop can be organised on the role of aquaculture and capture fisheries in the broader food economy.

Theme 6: Rebuilding fish stocks by 2015: Dreams vs. reality.

13. The Secretariat has on several occasions drawn the Committee's attention to the call for rebuilding fish stock by 2015 as enumerated in the WSSD Johannesburg 2002 Plan of Action. At present rate of policy change this seems to be a rather lofty objective. Hence policy makers need to consider appropriate responses both to achieve the goal (i.e. course correction), and in this regard also to more clearly enumerate what is meant by the WSSD when it says that "*maintain or restore stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015*". The Committee can appropriately provide policy advice on how to interpret the WSSD objective taking into consideration the economic state and potential value of the fisheries and to suggest appropriate management models that can, with due regard to the socio-economic imperatives as called for in the eco-system management approach, rebuild fish stocks. Equally, if it is not possible to rebuild fish stocks to the required level by 2015 appropriate argumentation needs to be developed.

Theme 7: Climate change and fisheries

14. An important internationally shared issue is climate change and how this is likely to impact on fisheries. There are potentially important changes to production, processing and trade caused by climate changes in the marine environment that will have social and economic consequences for communities that are dependent on fisheries. In this respect Ministers meeting at the 2007 MCM noted that "…….*getting the policies right in this area is important to ensure that mitigation of, and adaptation to climate change occurs at the lowest cost to economic development."* The Committee has already considered a report on the issues (AGR/FI(2006)13/Part2) but more work may be warranted in terms of identifying adaptation policies in fisheries that may potentially ease the adjustment burden for fishing communities. The report considered by the Committee in the autumn of 2006 concludes that "*Overall, on balance, climate change appears to have consistently negative impacts on fish ecology and fisheries. The social and economic effects are less clear; however it is likely that the economies of countries with the lowest levels of adaptive capacity will be most vulnerable to the effects of climate change on capture fisheries*." Identification of such social and economic effects (and their quantification) and associated mitigating policies could be considered.

Theme 8: Eco-labelling

15. A particular interesting outcome of the Fisheries Globalisation Workshop was the notion that sustainability is a *sine quo non* for all value chain elements. In the meantime, it was also noted that present fisheries management policies and practices have not been particularly successful in addressing the sustainability of fish stocks. Hence private operators are increasingly opting for eco-labelling schemes to convey, to consumers and investors, that the products they carry are sourced from sustainably managed resources. The proliferation of eco-labels, with various messages and often without regard to the FAO Guidelines, is a major policy challenge for OECD countries; consumers are confused; private fisheries operators are sending "conflicting" signals and the resource base is not necessarily helped. There may be a need to build an enforceable framework that can ensure that the messages that are being exposed are truly "eco-label-like" and do have an impact on the sustainability of fish stocks, which is their primary objective. Work on this area could explore the role of private companies and NGOs involved in private certification processes in fisheries and how this interacts with public policy. Among other things, this could help improve the understanding on how operators in this field move to set the agenda. A workshop on this topic may in particular be useful.

5. Timetable

16. The Committee is requested to discuss this document and advise the Secretariat on the themes it wishes to work on in its 2009-2010 Programme of Work. As mentioned earlier, it is unlikely that resources are available to cover more than two substantive themes, in addition to the work on the Review of Fisheries. On the basis of this discussion and advice with regard to priority areas to be covered, the Secretariat will elaborate a more detailed Programme of Work for consideration by the Committee at its 101st Session in April 2008. That document will provide more detailed project outlines, including expected outputs and associated resource allocation for the themes that receives most support.

17. At the 101st Session in April 2008, the Committee is expected to agree to a 2009-2010 Programme of Work that subsequently will be submitted to Council for consideration as the Committee's input into the PoW and Budget of the Organisation (according to the planning schedule as known at this point in time). Detailed elaboration of the themes can, however, be considered by the Committee at its 102nd Session in October 2008.

6. Resource issues

18. A recurrent problem in the fisheries work has been the lack of statistical resources. While some flexibility with the newly created Trade and Agriculture Directorate has been identified, it still remains that the work of the Committee for Fisheries does not benefit from dedicated statistical resources. In this regard, Delegates are, on a continuous basis, asked to see if there is any possibility of contributing voluntary funds towards the financing of assistance.

19. An additional option that Delegates may wish to consider is that of secondment of staff to the fisheries secretariat for a specified period of time. Previous secondments have proven very useful for the Secretariat and extremely beneficial to the donor country. Secondments may be for either short periods of time (say, 2-6 weeks) to work on a particular issue, or for longer periods (6-12 months) for more in-depth involvement in the Committee's work.

20. The Committee is also reminded that most of the Committee's work relies heavily on inputs from participating countries (in terms of papers, case studies and voluntary contributions).

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Organisation de Coopération et de Développement Economiques
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TRADE AND AGRICULTURE DIRECTORATE
FISHERIES COMMITTEE

TAD/FI(2007)12
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DRAFT REPORT ON CAPACITY ADJUSTMENT THE POLITICAL ECONOMY OF DECOMMISSIONING PROGRAMMES

This paper is the second revision of AGR/FI(2006)18 which was discussed at the 98th and 99th Sessions of the Committee for Fisheries.

This draft report is submitted for APPROVAL to the 100th Session of the Committee for Fisheries, 29-31 October 2007, under item 8. 1).

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JT03232939

English - Or. English

NOTE BY THE SECRETARIAT

This paper is the second revision of AGR/FI(2006)18 which was discussed at the 98th and 99th Sessions of the Committee for Fisheries. The key revisions to the paper for the 100th Session are:

- Inclusion of a case study on decommissioning schemes in Korea;
- Incorporation of oral and written comments received at and since the 99th Session; and
- Further refinement of the discussion in some parts of the text.

The paper is presented to Delegates for APPROVAL. If the paper, including the best practice guidelines, is approved, it is intended that the best practice guidelines will be forwarded to the Council for adoption as a Council Recommendation.

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EXECUTIVE SUMMARY

Decommissioning schemes are widely promoted as providing a "win-win" outcome for fisheries with expectations of reductions in capacity, improved profitability and less pressure on stocks. Around USD 430 million was spent on such programmes in OECD countries in 2003, accounting for 7% of total GFTs (OECD 2006a). However, there are concerns that decommissioning schemes often fail to reach their objectives from both an economic and an environmental perspective. So why do they remain so popular with policy makers?

The answer lies, at least partly, in the fact that decommissioning schemes are widely viewed as an active and highly visible policy intervention that is indispensable in the policy toolkit for dealing with the problems of excess capacity in fisheries. The political appeal to governments of such schemes is strong, while industry is also often attracted to decommissioning schemes as a means of improving the profitability of the industry and promoting industry rationalisation.

From an economic perspective, however, the use of decommissioning schemes is not without its pitfalls. Recent analysis and experience has identified a number of theoretical and practical issues arising from their use, indicating that careful planning is required in the development and implementation of such schemes. This report reviews the key economic and policy issues underlying the design, implementation and outcomes of decommissioning schemes in fisheries. Drawing on theoretical insights and practical lessons from experiences of OECD countries, the issues addressed in the analysis include: the role of management arrangements in determining the long term success of decommissioning schemes; who should pay for decommissioning schemes; price formation mechanisms; and the role of expectations of fishers in undermining the effectiveness of the schemes.

A selection of recent examples of decommissioning schemes in OECD and non-OECD economies is presented in the report. These highlight a range of innovative directions in design of decommissioning schemes as well as some continuing challenges. The case studies are:

- Industry-funded buyout in the United States Bering Sea/Aleutian Islands King and Tanner Crab Fishery;
- NGO-funded permit buyout in the United States Pacific Groundfish fishery;
- Australia's Business Exit Assistance scheme under the *Securing our Fishing Future* structural adjustment package, funded by government;

- Mandatory, government funded vessel decommissioning scheme for tuna longline vessels in Chinese Taipei;

- Decommissioning schemes in France financed by EU and French government funds; and

- The series of decommissioning schemes undertaken for the coastal and offshore fleets in Korea.

The success of decommissioning schemes and the outcomes for fisheries will be influenced by the degree to which the political economy aspects of policy reform influence the design and implementation of decommissioning schemes and associated policy measures. The report examines a number of dimensions of this issue including; the role of economic and environmental conditions in forming coalitions of support for the introduction of the industry adjustment assistance; the distribution of benefits both within the industry and over time; the use of decommissioning schemes as compensation strategies to gain support for or reduce opposition to wider reforms in the fishery or sector; and the importance of policy credibility in helping ensure that governments and industry reap the potential benefits from decommissioning schemes.

The main conclusion of the report is that decommissioning programmes have been demonstrated to be a useful policy tool, but only in certain circumstances. They can accelerate the transition to a rationalised fishery managed on the basis of stronger use and access rights (based on output or input parameters) and improved ecosystem health. As part of a package of transitional assistance and management changes, they can provide a window of opportunity to help transform the nature of a fishery from one characterised by non-cooperative behaviour to one in which incentives are well-aligned and cooperation is the rational outcome of interactions between fishers.

However, decommissioning schemes used on their own do not provide a long term solution to the problems of the “race-to-fish” incentive that remains in fisheries with poorly developed or enforced use and access rights. Unless complementary measures are taken to effectively manage the fishery, short term gains from the buyback are likely to be eroded as remaining fishers expand effort, previously inactive vessels and licences are activated, or as new entrants join the fishery. Moreover, the provision of continuous, on-going decommissioning funding is likely to result in rising vessel and licence prices as expected future resource rent is capitalised into asset values. This will increase the cost of future decommissioning and necessitate a continuous process of exogenous reductions in vessel capacity to offset the effects of effort creep driven by technological change and capital stuffing over the longer term.

The report develops a set of best practice guidelines, based on the analysis, that identify the key areas that policy makers need to be aware of when designing decommissioning schemes. The following guidelines are intended to assist policy makers ask the right set of questions as they develop programmes.

Box 1. Best Practice Guidelines for Decommissioning Schemes

1. Prevention is better than cure

It is usually much easier and less expensive to ensure that management systems are properly designed to prevent overcapacity and overfishing from occurring than it is to undertake capacity reduction after the fact.

2. Clear objectives are essential

Well-defined, clearly articulated and measurable objectives for decommissioning schemes will help ensure that the targets are achievable, that the mechanisms are appropriately specified, and that the full range of management policies for the fishery are coherent and mutually supportive. This also reflects key principles of good governance.

3. Ensure effective post-adjustment management is in place

It is imperative that the management regime in place following the decommissioning effectively prevents capacity from re-entering the fishery. Without such a measure, the beneficial effects of decommissioning will be negated over the medium to longer term.

Improving the specification and enforcement of fishery adjustment plans, including the use of transferable access rights (based on either output or input dimensions), will help ensure that incentives are appropriately aligned and will facilitate autonomous adjustment in the fishery in the future.

4. Decommissioning schemes work well as part of a package of adjustment measures towards sustainable and responsible fisheries

Decommissioning schemes will not, on their own, address the fundamental problems of overcapacity and overfishing.

Decommissioning schemes can be successful in reducing capacity as part of a one-off structural adjustment program where the management regime is also changed to one that provides more security and stability and addresses the market failures leading to the overcapacity problem. The schemes can aid in the transition to a more responsible fishery in which the sustainability and profitability are improved.

5. Getting value for money

Auctions will generally provide the most cost effective means of determining prices to be paid to retire vessels and licences. Under most circumstances, they help address information asymmetries and lead to allocative efficient outcomes.

Auctions can, however, be complicated and costly, and tradeoffs may need to be made between allocative efficiency and transactions costs in choosing between auctions and other forms of pricing such as fixed rate payments.

6. Achieve effective capacity reductions

Both latent and active capacity needs to be targeted to ensure that capacity is effectively reduced and that effort does not become reactivated in the fishery. The sequencing of buyouts may be an important consideration.

7. Require beneficiaries to pay a proportion of the costs of decommissioning

Under the beneficiary pays principle, those vessel owners who benefit from increased resource rent resulting from capacity reductions may be required to contribute to the costs of the decommissioning schemes.

A combination of industry and public funding has worked effectively to reduce the impact on the public coffers while improving the incentives for cooperative management in the post-adjustment fishery.

8. Stakeholder involvement will improve acceptance and compliance

The involvement of stakeholders in the design and implementation of decommissioning schemes will improve the likelihood of cooperation in both the conduct of the schemes and the post-adjustment of the fishery.

9. Undertake ex-post evaluation

Ex-post evaluations of decommissioning schemes, linked to measurable performance indicators developed with the scheme's objectives, can help to ensure that lessons learned inform the design and implementation of future schemes.

1. INTRODUCTION

1. Decommissioning schemes are widely promoted as providing a "win-win" outcome for fisheries with expectations of reductions in capacity, improved profitability and less pressure on stocks. Around USD 430 million was spent on such programmes in OECD countries in 2003, accounting for 7% of total GFTs (OECD 2006a). However, there are concerns that decommissioning schemes often fail to reach their objectives from both an economic and an environmental perspective. So why do they remain so popular with policy makers?

2. The answer lies, at least partly, in the fact that decommissioning schemes have a special resonance for both policy makers and fishers. The schemes are widely viewed as an active and highly visible policy intervention that is indispensable in the policy toolkit for dealing with the problems of excess capitalisation and capacity in fisheries. The political appeal of such schemes is strong in many countries and governments who introduce them generally expect to reap benefits from the high profile that is often attached to the introduction of the schemes. Industry is also often active in seeking the implementation of decommissioning schemes, both to improve the profitability of the fishers who remain in the industry and to provide a dignified exit from the fishery for marginal or unprofitable fishers. Lobbying for adjustment assistance is a regular feature of fishery organisations' representations to governments.

3. From an economic perspective, however, the use of decommissioning schemes is not necessarily that straightforward. Recent analysis and experience has identified a number of theoretical and practical issues arising from their use, indicating that careful planning is required in the development and implementation of such schemes. The apparent inconsistency between the appeal of the schemes and the schemes' practical outcomes is the subject of this part of the Committee's major project on fisheries policy reform. The objective of this paper is to provide a review of the development, implementation and outcomes of decommissioning schemes drawing on economic analysis and case studies of practical experience. Analysis is also undertaken from a political economy perspective as this will offer additional insight into the use of these schemes as they often take place in response to economic or environmental crises and calls for assistance from the industry. Much has been written about the economics of decommissioning schemes but there is a need to integrate this body of work into a policy-relevant context in which the demand for and supply of policy concessions is a central element. The main outcomes of the analysis will be to improve the understanding of the factors underlying the success or otherwise of decommissioning schemes and to provide policy makers with a set of practical guidelines to improve the design and implementation of the schemes.

4. The next chapter in this paper reviews the key economic issues in the design and implementation of decommissioning schemes, focusing in particular on the objectives of the schemes, price formation, the role of the management framework, financing of the schemes and the role of expectations. A number of detailed case studies of decommissioning schemes are then presented in Chapter 3 drawing on a variety of recent experiences in the United States, Australia, Chinese Taipei, France and Scotland. Chapter 4 addresses a range of political economy issues that arise in relation to decommissioning schemes that will influence the acceptability and eventual success of the schemes. In the final chapter, a set of practical guidelines for assisting policy makers in designing and implementing decommissioning schemes is presented.

2. ECONOMIC ISSUES IN DECOMMISSIONING PROGRAMMES

5. The economics of decommissioning schemes has been addressed in a number of recent studies including Campbell (1989), Holland *et al*. (1999), Banks (1999), Cunningham and Greboval (2001), Munro and Sumaila (2001), Clark *et al*. (2005), Squires *et al*. (2006) and OECD (2006a). In particular, a major recent publication by Curtis and Squires (2007) brought together the experiences from a wide range of case studies that were presented at an international meeting in the United States in 2004. From this literature, it is clear that the design and implementation of decommissioning schemes (which are broadly defined – see Box 2) varies significantly both between and within countries. For example, some countries require that decommissioning payments be tied to the physical scrapping of vessels while others allow vessels to be shifted to another fishery (in which case the payment is for the removal of excess capacity from a particular fishery rather than reducing the overall capacity in the country). Some schemes are intended to remove latent capacity or effort instead of capacity or effort that is currently engaged in fishing so reducing potential rather than actual pressure on particular fisheries. Auctions and flat rate payments are both widely used, each with advantages and disadvantages.

6. This chapter discusses the economics of decommissioning schemes, illustrating theoretical insights with experiences from decommissioning schemes in both OECD and non-OECD economies. The analysis draws primarily on existing literature and is intended to provide policy makers with a thorough understanding of the economic underpinnings that should inform the design of decommissioning schemes. The range of economic issues addressed include: the objectives of the schemes; the importance of existing and future management arrangements; financing of decommissioning schemes; whether vessels or licences should be purchased; mandatory or voluntary participation; the price formation process; conditions on the further use of the vessel or licence; and the role of expectations and moral hazard.

Box 2. Terminology and Concepts

Decommissioning schemes

There is a range of terms for decommissioning schemes in common use across OECD countries. These include vessel buyback programs, licence retirement schemes, licence buybacks, vessel scrapping programmes, and vessel transfer programmes, just to name a few. This paper includes all these types of schemes under the generic heading of decommissioning schemes (which is used interchangeably with the term buyback programmes).

Excess capacity

Capacity is, for a given resource condition, the amount of fish or fishing effort that can be produced over a given period of time by a vessel or fleet, given the technology, fixed factors of production, no restriction on variable input usage, and customary and usual operating procedures. Excess capacity in a fishery arises whenever the capacity of the fleet is higher than required to ensure a target level of sustainable exploitation of the fish stock. Assuming that excess capacity is determined with respect to maximum sustainable yield (MSY), excess capacity indicates that the fleet size is larger than required to harvest MSY. This will result in overfishing if the fleet is operating at or near full capacity. However, this will not be the case if capacity utilization is low as the result of management measures that have been successfully introduced to prevent overfishing. That is, overfishing implies excess capacity but excess capacity does not necessarily imply overfishing.

Sources: OECD; Cunningham and Greboval (2001); Grafton *et al*. (2006).

Objectives of the Schemes

7. In an early survey of decommissioning schemes, Holland *et al*. (1999) identified three main goals of decommissioning schemes:

- saving vessel owners or licence holders from losses they would otherwise incur, because of the unavoidable adjustment in a fishery in crisis;
- improving the profitability of the rest of the industry following the capacity adjustment; and
- rebuilding fish stocks.

8. The schemes they surveyed clearly have mitigated the losses of some fishers and vessel owners, although it is debatable whether the expenditures covered total losses from adjustment. Whether such programs have had a positive effect on the profits of the remainder of the industry was not always clear according to their survey. At the very least there need to be some controls on investment in the industry or incentives to prevent re-investment from taking place on too large a scale. However, in many of the programs they surveyed, the money spent on buy-backs apparently leaked back into the industry or removed capacity that was not very important in any case. In some cases, the reduction in the number of vessels was neutralized by increased effort by the remaining vessels. With respect to resource conservation objectives, the authors point out that all the programs they considered had other measures in place to deal with this problem. They concluded that decommissioning schemes therefore seem to have been motivated mainly by the desire to increase profitability and to mitigate losses from adjustment.

9. A clearly defined objective or set of objectives is, therefore, an obvious prerequisite for a successful decommissioning scheme, as this will help in ensuring that the appropriate policy tool is used to address the particular problem. For example, using a decommissioning scheme in an effort to rebuild resource stocks is unlikely to be successful as it does not address the fundamental problem of inadequate management that generally is the primary reason for pressure on resource stocks. Excess capacity in the form of too many vessels or too many licences is a symptom of the problem, rather than the cause. A focus on improving management arrangements would provide a greater return to the use of public funds than would a decommissioning program on its own.

10. Similarly, the use of a decommissioning scheme to improve the profitability of the industry would not be successful if the management arrangements following the buyout did not ensure that the benefits of the buyout accrued to the remaining fishers in the form of increasing resource rent. Any resulting increase in resource rents to be competed away by new entrants or expanded effort, nullifying the short-term benefits of the scheme.

11. These factors point to the need to view decommissioning schemes as part of a package of adjustment measures, and not as an end in themselves. A comprehensive and coherent set of objectives and matching policy measures is needed to take a holistic approach to a particular fishery's problem, identifying underlying causes of poor profitability and resource pressure and tailoring a series of appropriate policy responses. Such packages will generally, but not always, involve a combination of management change and decommissioning schemes, perhaps with additional social support. As a result, decommissioning schemes are best viewed as a time-limited transitional measure to assist fisheries towards profitable and sustainable futures. This should be reflected in the objectives of specific decommissioning schemes.

Existing and Future Management Arrangements

12. The importance of the existing and future management arrangements for fisheries targeted for a decommissioning programme cannot be understated. It has been well established, both theoretically and from practical experience, that the economic and environmental outcome of decommissioning schemes depends critically on the management of the capacity and effort that remains in the fishery. Both the existing management regime at the time of the buyout, and the management regime that follows (assuming there is some change), will have an influence.

13. OECD (2006a) reviewed in detail the economic effects of decommissioning schemes under different types of management regimes. In the case of an ***open access fishery***, decommissioning payments will have no effect on fish stocks as new vessels will enter the fishery to replace the scrapped vessels. Indeed, the effects may be negative on stocks as decommissioned vessels would be replaced by new vessels which are typically more efficient than older ones. There may be a short term impact in terms of reduced catches, improved profitability and stock improvements, but in the medium to long term the lack of control on effort leaking back into the fishery will negate any beneficial effects from the decommissioning scheme and dissipate any resource rent that may have been generated. The Washington State Commercial Salmon Fishery in the US exemplifies the problems associated with the use of buyback programs in open access fisheries. This fishery, which was essentially open access during the 1990s, had a series of three buyback programs in the late 1990s at a cost of USD 14 million, primarily in response to overcapitalisation and the impact of unusual weather events (GAO 2000). A review of the three programs found that they were not effective at making inroads into fishing capacity due precisely to their open access nature, and that the programs could best be described as income transfer programs (Muse 1999).

14. Under a ***regulated open access regime*** where only the catch is controlled, a decommissioning program would have no effect as, in the absence of barriers to entry, the vessels being decommissioned would simply be replaced by new vessels. If there are ***effort controls*** in place (*e.g.* through limited entry), there will still be an incentive for the vessels remaining in the fishery to engage in input (or capital) stuffing in response to the initial lower level of effort, increased stocks and greater profits. However, given that most effort controls are defined with vessels (and often a small number of vessel attributes, such as power and tonnage) as one of the main control parameters, this impact may not fully offset the increase in stocks resulting from the initial decommissioning scheme and so the effects of the decommissioning scheme will be eroded. The related issue of latent effort is also problematic as the reduction in active capacity will be likely to trigger the activation of latent effort, resulting in a similar expansion of effective effort despite an apparent reduction in capacity (measured as the number of vessels or permits).

15. The problems of effort expansion in limited entry or regulated open access fisheries following a buyback of vessels or permits have been well documented. A review by the US General Accounting Office of the effectiveness of several buyback programs in the US highlighted the role of post-buyback effort expansion. It made a number of recommendations including prohibiting buyback participants from entering any fishery with excess capacity, placing restrictions on latent effort, minimising incentives to increase capacity, and developing performance measures to evaluate buyback programs with respect to capacity and conservation of fish stocks (GAO 2000).

16. The New England Groundfish fishery was one of the fisheries reviewed by the GAO. The National Marine Fisheries Service (NMFS) implemented a vessel buyout and a permit buyout in this limited access fishery. The two buyback programs were implemented at different times and for different reasons (Thunberg *et al.* 2004). The vessel buyout was introduced at a time when resource conditions were very poor and was designed to provide financial assistance to the fishing industry as well as removing active fishing capacity. However, it was feared that the entry of formerly inactive vessels would thwart the gains in resource recovery and, in turn, require further reductions in vessels that that had borne the brunt of

effort reductions in the fishery. The permit buyout was therefore designed to remove as much potential fishing capacity as possible before latent effort could be activated. The two buyout programs removed nearly 20% of the potential capacity output and helped to lay the foundations for a shift in management regime towards more market-based methods of adjusting capacity and effort (including leasing and transfers of days-at-sea among limited access vessels, and community-based quotas).

17. The impact of effort creep in offsetting the positive effects of decommissioning of capacity in input controlled fisheries is well illustrated by the experience in Australia's Northern Prawn Fishery (NPF) (see Box 3). The NPF has been controlled by input measures and has been subject to almost continuous restructuring and capacity reduction over the past two decades. However, improved harvest technology and a rise in the use of unregulated fishing inputs largely negated the effects of the dramatic capacity reductions that took place. In the case of the EU, Frost and Andersen (2006) argue that the combination of decommissioning schemes and increasingly strict entry conditions has made it more difficult to increase capacity and substitute between inputs, although such a command and control system requires regulators to stay one step ahead of fishers and can induce a race to regulation (OECD 2006a). They also note that the recent shift in the EU towards tradable days-at-sea for a number of fleet segments that exploit species under stock recovery plans has many characteristics of ITQ systems and may have much the same effects on automatic capacity adjustment in the longer term.

18. Problems of latent effort and effort creep evident in many limited entry or input controlled fisheries are likely to be exacerbated by the use of decommissioning schemes. The short term impacts of such schemes in terms of improved catches and profits can provide an incentive to spur effort expansion or activation of capacity. It has also been pointed out that decommissioning can facilitate such expansion by providing a source of funds for reinvestment (Jorgensen and Jensen 1999; Banks 1999). Measures are therefore needed to ensure that the post-buyout management regime effectively constrains capacity and effort from expanding.

Box 3. Continuous Adjustment in Australia's Northern Prawn fishery

The Northern Prawn Fishery (NPF) has, for many years, been managed through a combination of input controls (limited entry, seasonal closures, permanent area closures, gear restrictions and operational controls). Poor profitability and serious declines in resource stocks led to a process of fleet restructuring and capacity reduction that has been almost continuous over the past two decades. A series of industry-funded buybacks (with limited government assistance through the provision of government backed loans) reduced the fleet from a maximum of 302 boats in the early 1980s to 137 boats in 1995 and to 83 boats in 2005. The effectiveness of the buyback schemes needs to be viewed over both the short and medium term. In the short run, the schemes were effective at removing capacity from the fishery, resulting in some stock recovery and increased net returns over what would otherwise have been the case. Over the medium term, however, effective effort increased steadily in response to continually improving harvest technology and a rise in the use of unregulated fishing inputs. This resulted in further rounds of buybacks and the cycle continued. While the key stocks of banana, tiger and brown prawns are no longer classified as over-fished, net economic returns to the fishery have fluctuated markedly over the last decade and have declined rapidly since 2001.

More recently, a buyout of fishing concessions under the *Securing our Fishing Future* structural adjustment package in 2006 (see Chapter 3 of this report). This is to help the industry move towards a management regime with a stronger set of use rights including the introduction of fully transferable Statutory Fishing Rights governing the number of trawlers that may operate in the fishery and the gear that can be used.

Source: Newby *et al.* (2004); Galeano *et al.* (2006); Australian Fisheries Management Authority

19. In the case where there are ***effective use or property rights***, the effects of vessel decommissioning would be negligible. The remaining owners of the quota or effort rights receive the benefits from capacity leaving the fishery but have no incentive to expand effort or capacity and so there is merely a transfer from taxpayers both to those leaving the industry and to those remaining behind. It is difficult to see the justification in a decommissioning scheme in this case, especially if it is an individual

quota regime. With individual transferable quotas, the quota holders have incentives to achieve optimal effort and capacity with market processes driving automatic adjustment. In a fishery with too many vessels, some vessel owners would find it attractive to sell their quotas rather than renewing their boats, while other vessel owners would find it attractive to buy quotas to improve the profitability of their own operations. In a regime like that, the industry would on its own initiative, and at its own expense, restructure itself. A decommissioning scheme would speed this process up and raise the value of the rights (quotas) in the industry, but it would have no effect on catches or stocks.

20. Decommissioning vessels within a system with property rights to effort would not make sense unless there are too many vessels. It is possible to distinguish between two situations: first, where the total effort is adequate but is spread among too many vessels, so that profits are lower than they could potentially be; or second where not only are there too many vessels, but the total effort is too large. In the first case, it would be possible to raise the profits of the fleet by getting rid of redundant vessels and transfer their effort allowance to the remaining vessels. As with individual transferable quotas, there would be an incentive for the industry itself to buy out the redundant vessels and add their effort quota on some previously underutilized vessels. Decommissioning grants could speed up this development and raise the value of the fishing rights. In the second case, it would be necessary to reduce the total effort. Effort allowances of decommissioned vessels would have to be nullified, until enough vessels have been withdrawn to make the effort rights of remaining vessels equal to the sustainable effort.

21. Despite the apparent redundant nature of decommissioning schemes within a management framework based on strong property rights, there are examples of them being used in such situations. In the 1990s in Iceland, for example, there was a buyout of vessels with licences within the ITQ system (Box 4). The decommissioning scheme was financed primarily through levies and surcharges on the vessels and a firm in the fisheries sector, supplemented by a state guaranteed loan, and was intended to rationalise quota holdings and improve financial performance individual companies and the sector as a whole.

22. In another example, a structural adjustment program was instituted in the south east trawl fishery in Australia in the wake of the final round of allocation of individual transferable quotas in 1994. One of the primary reasons for the buyback was to reduce overcapacity that had carried over from the pre-ITQ era and which was proving difficult to remove through natural attrition due to the multispecies nature of the fishery (where not all species were under ITQ management) (Newby *et al.* 2004). The buyback resulted in six latent and fourteen active permits being retired and, in conjunction with the establishment of an industry-assisted quota brokerage service, resulted in a significant improvement in economic performance (Fox *et al.* 2006). However, a secondary purpose of the buyback was to remedy opposition from aggrieved fishers to the initial allocation of quotas (AMC 2000). Litigation over the quota allocation continued for some years and created uncertainty within industry and government about the security and stability of the ITQ management arrangements. The buyback was therefore also partly intended to compensate fishers who had their fishing operations affected by the move from input based units to output based ITQs.

23. In summary, it is clear that the effectiveness of decommissioning schemes in securing long-term benefits to a fishery will be determined by the management regime in the fishery. Ensuring that capacity and effort does not re-enter the fishery is crucial as failure to do so would not achieve the expected improvements regarding the resource and economic sustainability of the fishery. Decommissioning schemes are probably best viewed as a strategic tool that can facilitate the transition of a fishery to improved management arrangements based on a stronger and well-enforced set of use or property rights. This will help to restructure incentives for autonomous fleet capacity adjustment following the completion of decommissioning and avoid the need for future buybacks. The improved economic conditions that usually follow an effective buyback can provide a window of opportunity to garner support for management changes. Crucially, though, it must be recognised that decommissioning schemes do not in themselves alter the underlying incentives to over-invest in open or limited access fisheries.

Box 4. Decommissioning Vessels in the Icelandic ITQ system

Following a series of three publicly funded decommissioning schemes in the 1980s which were ineffective in reducing capacity, the Icelandic government established the Development Fund of the Fisheries (DFF) in 1994. The main objectives of the DFF were to: buy obsolete processing plants and equipment to reduce overcapacity in the land-based fish processing industry; subsidise the decommissioning of vessels and reduce capacity in relation to the sustainable catch of fish; and to facilitate structural and organisational changes to rationalise operations and increase profitability of the fisheries. Low profitability in the fishing sector was caused primarily by the high level of financial gearing (leverage) and low level of equity ratio in fisheries companies. By decommissioning vessel with quota shares it was anticipated that the quotas would be transferred to vessels which remained in the system. The scheme therefore addressed financial problems and rigidities in the sector rather than stock over-exploitation concerns.

The DFF was funded through levies and surcharges on the vessels and firms in the fishing sector. Vessel owners with a fishing licence paid IKR 750 per GRT, with the maximum payment being IKR 285 000 per vessel. From September 1996, all quota holders paid a levy of IKR 1 000 per tonne of quota. Owners of processing plants paid a surcharge of 0.75% of the value of the plants' assets. The decommissioning payments were calculated as a percentage of the full coverage insurance value of the vessel. In 1994, the payment was set at 45% of the full insurance value, decreasing to 40% and then 20% in following years. Special provision was made for small vessels both inside and outside the ITQ system.

During the period 1994-98, payments to the DFF was IKR 2.3 billion and subsidies for decommissioning of vessels and obsolete processing plants amounted to IKR 3.2 billion, with 87% being directed towards vessel decommissioning. The difference was covered by a state guaranteed loan. Most of the expenditure on vessel buyouts occurred early in the programme (1994) while payments to retire obsolete plants followed a few years later. A total of 459 vessels were retired, totaling 7 829 GRT with an average vessel age of 18 years.

While it is normally expected that a comprehensive ITQ system such as that in Iceland will induce automatic capacity adjustment within the sector, the DFF effectively provided an impetus for the industry to rationalise quota holdings. The relative quota per vessel increased and vessel efficiency and profitability improved. The industry funded decommissioning scheme thus served to speed up the adjustment process and reduce pressure on the management system stemming from poor profitability, enforcement difficulties and lack of compliance with regulations.

Source: Klemensson (1999)

Financing Decommissioning Schemes

24. From an economic perspective, a relevant public policy principle in determining how decommissioning schemes should be funded is that of "beneficiary pays". Under the beneficiary pays principle, industry participants who stand to benefit from a policy intervention should contribute to the costs of the policy intervention (Weimer and Vining 2004). This is similar in many ways to user pays and polluter pays concepts in that it seeks to better match incentives and objectives within an industry or sector. The beneficiary pays principle forms the basis of the cost recovery programmes used in a number of OECD countries, including New Zealand, Australia and Iceland (OECD 2003). The range of beneficiaries from a buyout need not be restricted to commercial fishers as other groups may also benefit following a buyout, depending on the particular circumstances. For example, recreational anglers can benefit from higher catch rates, and NGOs can gain from an increase in non-market benefits (see the case study in Chapter 3 on an NGO-funded buyout in the US).

25. In practice, decommissioning schemes have historically been funded by governments. This has reflected, at least in part, a concern that the need for decommissioning of licences or vessels is appropriate in terms of correcting past policy failures. Where governments have allowed fleet capacity to expand, or even encouraged expansion through the use of vessel construction and modernisation subsidies, there may be an obligation for government to redress the resulting excess capacity problem when the inevitable industry downturn occurs in the form of rent dissipation and pressure on stocks. For example,

decommissioning schemes in the European Union are funded by governments with funds coming from the Financial Instrument for Fisheries Guidance and, from 2007, the European Fisheries Fund, and EU Member States. EU regulations govern the amounts of money that may be spent and in what manner (see the EC Regulation governing decommissioning 2792/99 and Box 10 in Chapter 3). In many non-EU countries, decommissioning schemes are also predominantly publicly funded. For example, the shrimp vessel decommissioning scheme undertaken in Mexico in 2005 was 100% government funded (see Box 8). Similarly, Canada's and Japan's decommissioning schemes have been publicly funded.

26. Increasingly, however, mixtures of public and private funding are being used in OECD countries. In these cases, the industry contribution to the buyout is often facilitated through a government loan that is then repaid through annual levies on landings or through licence fees. A trend towards greater industry involvement in buyouts is evident in the United States where privately funded buybacks are regarded as a more effective approach to buybacks (NMFS 2004). Amendments to the Magnuson-Stevens Act in 1996 allowed buyback loans to be paid off by some combination of Federal grants and special appropriations, funds provided by States or other public or private or not-for profit organisations, or by industry fees. In recent years, three large buyback schemes have been predominantly funded by industry (Table 1). The Northern Prawn Fishery in Australia has seen a series of industry funded buybacks (with some limited government assistance) in which the government backed loan to the industry was repaid through levies on the remaining fishers (Box 3). In contrast, a buyback in the Northern Territory barramundi fishery was financed by a commercial loan on the basis of expected revenues from licences (World Bank 2004). Norway provides yet another model for facilitating public/private funding and ensuring incentives are well aligned (Box 5).

Table 1. Funding of Vessel and Permit Buyback Schemes in the United States

Buyback name	Year	No. of vessels	No. of permits	Cost of buyback (USD million)			
				States	Industry[a]	Federal	Total
NE Multispecies	1994	11	67			2.0	2.0
NE Multispecies	1995	68	475			22.5	22.5
Texas Inshore Shrimp	1995		310			1.4	1.4
Washington Salmon	1995		142			5.2	5.2
Washington Salmon	1997		391	1.2		3.5	4.7
Alaska (Bering Sea) Pollock	1999	9	17		75.0	15.0	90.0
NE Multispecies	2002		245			10.0	10.0
Pacific Coast Groundfish	2003	91	240		35.7	10.0	45.7
Alaska (Bering and Aleutian) Crab	2003	28	43		100.0		100.0
Total		**207**	**1 930**	**1.2**	**210.7**	**69.6**	**281.5**

a. Industry cost is the form of a loan from the government that is repaid by the industry following the buyback.

Source: NMFS (2004).

Box 5. An alternative model of public/private funding in Norway

An alternative model of public/private funding for decommissioning has been used in Norway. On 1 July 2003, a fund was established for the decommissioning of coastal fishing vessels up to 15 meters holding annual permits. The scheme is funded through a fee on the value of first-hand landings of every Norwegian fishing vessel (not just the vessels remaining in the coastal fleet). The government provided a capital injection to the fund of NOK 35 million in 2004, estimated to be around 50% of the contribution from the industry in that year. Further government contributions were not guaranteed and there is a five year sunset clause for the scheme. The aim of the scheme is to collect about NOK 350 million over the five years which would enable the scrapping of approximately 15% of the coastal fleet less than 15 meters.

Source: OECD (2006b)

27. In an innovative development, a privately funded buyout of fishing permits was carried out by a consortium of environmental NGOs in the United States in 2006. This buyout, which is reviewed in detail in Chapter 3, involved the joint purchase by The Nature Conservancy and Environmental Defense of a number of permits which were active in a proposed marine park, prior to the marine park being declared. This initiative is a marine extension of similar terrestrial purchases to preserve specific habitats that have been made by environmental groups in recent years in a number of countries.

28. From an economic perspective, the use of industry financed buyback programs helps to provide appropriate incentives for those fishers who remain in the industry. The remaining fishers are (usually) committed to repayment of a long-term loan (for example, up to 30 years in the case of the United States) and so have a strong incentive to maximise long-term profits within the constraints of resource sustainability. This is, of course, conditional upon the institutional arrangements being coherent with such an incentive, in particular by ensuring that effort is not able to creep back into the fishery. If this was not the case, the remaining fishers would have an incentive to maximise short term profits, with the attendant possibility that profits will decline over the longer term, resulting in possible default on the government loan or pressure for further adjustment assistance.

29. Another advantage of an industry funded decommissioning scheme is that the debt obligation becomes collective, rather than individual (Squires et al 2006). Collective borrowing also spreads the risk among the remaining fishers. Both these factors increase the prospects for cooperation both between fishers and between fishers and regulators in the future management of the fishery.

Purchasing Vessels or Licenses?

30. There are a number of factors that will influence the decision on whether to buy back vessels, licences, or both. First, the cost may vary significantly between vessels and licences. In general, purchasing licences is often cheaper than purchasing vessels, which in turn is often cheaper than buying both vessel and licence. As a result, there is a trade-off between affordability and the objectives of the scheme. Purchasing only the licence may leave the vessel free to fish elsewhere, while purchasing the vessel could allow the licence (if transferable) to be used with another vessel. The likelihood of such capacity spillovers can be mitigated by the imposition of conditions on the transfer and subsequent use of the licence or vessel, whichever is not the subject of the buyout. However, such conditions will have an impact on the purchase cost of the licence or vessel as the constraints will be factored in, or capitalised, in the value of the asset to be purchased.

31. A second factor is the nature of the regulatory arrangements in the target fishery. In some cases, the vessel and licence are bundled together and must be transferred (or decommissioned) as a package. This is the case, for example, in most of the Norwegian fisheries. In other cases, a vessel owner may have multiple licences, allowing them to fish in several fisheries, or for several species in the same fishery, or to

use multiple types of gear. Such "stacking" of licences is common in multi-species fisheries or in fisheries where there are a high proportion of part-time or inactive fishers. The value of the licence in the latter case is equivalent to an option value.

32. Third, purchasing inactive, or latent, licences or vessels may not have a significant or lasting impact on capacity or profitability in the fishery. In many cases, decommissioning schemes will generally either buy out the currently inactive capacity, with little effect on the actual level of capacity being employed in the fishery, or encourage the latent capacity to become active (Cunningham and Greboval 2001). This latter point is particularly significant from a political economy perspective as it highlights the dynamic nature of fisheries and fisheries policy and the rational response of fishers to policy signals from governments. Unfortunately, the lowest priced licences tend to be the least active vessels, such as vessels fishing part-time or in multiple fisheries, or those which are otherwise marginally profitable. Purchasing these licences may result in a high nominal rate of licence retirement, but with little actual effect on effective effort or capacity.

33. The potential problem of latent capacity was highlighted in a 2000 report by the US General Accounting Office (GAO 2000). In its review of the New England groundfish fishery buyback scheme, the GAO found that the 79 vessels that were purchased in the buyback accounted for around 15% of the total groundfish catch in that fishery in 1996. However, because of the number of unused fishing permits in the fishery, 62 previously inactive vessels began catching groundfish in the same year as the buyout. It was estimated that the 62 vessels collectively had over two-thirds of the potential fishing capacity of the 79 vessels purchased in the buyback. The problem was compounded by vessel owners who participated in the buyback purchasing a vessel with buyback funds and re-entering the fishery.

34. A potential solution might be to provide a larger initial budget for the buyback in anticipation of purchasing both active and latent capacity or permits. Such an approach was advocated by Funk et al (2003) in their review of the licence buyback for the Texas Bay Shrimp Fishery. They demonstrated that the benefits from a combination of licence limitation and buyback would be realised sooner if additional funds were available to purchase a higher number of licences at the start of the buyout, rather than through endogenously determined licence acquisition program then in place.

35. One of the common assumptions in the debate on decommissioning schemes is that the optimal strategy is to remove the vessels with the highest catch for the lowest cost. However, this assumption may be misleading if vessel characteristics are not the most important determinant of catching power. Branch *et al.* (2006) reviews the debate on the extent to which the "skipper effect" may explain a more significant variation in catch rates relative to other determinants commonly assessed such as vessel tonnage, power or gear. The review concluded that the individual differences among skippers were indeed significant, meaning that the effect of removing vessels may be offset to some extent by skilled individuals re-entering the fishery on other vessels. It is difficult to regulate and restrict such movements in human capital.

36. In summary, careful consideration of the desired outcome of the decommissioning scheme is required during the planning stage in order to determine whether vessels or licences or both should be targeted. This may in large part be determined by the nature of the regulatory arrangements governing participation in the sector, and the extent to which vessel and licence are locked together. It may also be influenced by budget considerations. Regulators also need to be aware of the extent of latent vessels or permits in a target fishery. The order in which capacity or permits are bought out can be significant in designing decommissioning schemes for fisheries in which latent effort is a problem. There may be advantages to purchasing latent effort first in order to ensure that it is not reactivated when a buyout of active capacity improves the economic conditions improve in the fishery.

Voluntary or Mandatory Participation?

37. Virtually all decommissioning schemes have been implemented on a voluntary basis. This is primarily due to perceptions of fairness and equity, as well as to the likelihood of legal complications that may arise in the case of compulsory acquisition. Only two schemes have been identified as being compulsory, or having a compulsory component. In 1993, there was a compulsory, across-the-board surrender of a proportion of fishing rights in the Northern Prawn fishery in Australia as the target set for a voluntary buyback had not been met (AFMA 1999). In Chinese Taipei, there was a mandatory buyout of large scale tuna long-line vessels in 2005 and 2006 (this scheme is reviewed in Chapter 3 of this paper).

Determining the Price

38. A key issue in the design of decommissioning schemes is the way in which purchase prices are determined for vessels, licences, fishing rights or gear. The experience of decommissioning schemes to date indicates that four broad types of mechanisms are used: auctions; fixed rate payments; one-on-one negotiations; and independent valuations (Holland *et al.* 1999). Each type of mechanism has advantages and disadvantages, and the relative effectiveness of each type will vary according to different situations. Table 2 provides a summary of the different types of price mechanisms and their advantages and disadvantages. The two main approaches used to date have tended to be auctions and fixed rate payments; in cases where there are many potential sellers, as is the case with most fishing vessel buyout schemes, the choice is practically constrained to auctions or fixed rate payments.

39. From an economic perspective, the fundamental objective in the choice of pricing mechanism is to achieve a cost-effective outcome which achieves allocative efficiency and provides "value for money". That is, the price mechanism should deliver either the most capacity reduction for a given budget, or achieve a given capacity reduction target at the least cost. A voluntary buyback process should therefore seek to elicit the valuations that individual fishers have of their willingness to sell their vessel or licence. These private valuations will be different for each fisher and will be influenced by a wide range of factors such as age, skill, alternative opportunities, assets, etc. Typically, the government has limited information about individual fishers' private valuations and must rely on revelation mechanisms to assist in overcoming the information asymmetry.

Auctions

40. In principle, an auction (or tender or bidding scheme) will provide the most effective means of ensuring that buyout prices for vessels or licences adequately takes account of private information held by the bidders.[1] The main advantage of an auction is its tendency, if properly designed, to attain allocative efficiency without requiring governments to have prior knowledge of resource values or costs. This outcome is achieved by promoting competition among bidders for decommissioning grants, forcing them to reveal information about their valuations through their bid. A fisher's bid will be influenced by both their own private valuation and their individual assessment of available information on other fishers' bids and private valuations. Theoretical analysis suggests that under standard auction rules, the optimal strategy is one of slightly overbidding so that the auction will not reveal bidders' true opportunity costs (Latacz-Lohmann and Schilizzi 2005). Overbidding is highest for low-cost bidders whereas high-cost bidders will bid closest to their true costs. However, low-cost bidders are usually selected early and so get paid well above their true costs. Box 6 provides a graphical analysis of the nature of the auction process.

1 . There is a well developed literature on the design of auctions under different conditions; see Klemperer 2003 for a survey of the literature.

Table 2. Price formation mechanisms in decommissioning schemes

Pricing mechanism	Type	Typical format [a]	Advantages	Disadvantages	Examples
Auction	Reverse auction	Fishers submit sealed bids. Bids ranked and accepted in order from lowest to highest.	Overcomes information asymmetry	High transactions costs. Requires large number of potential bidders	Washington State Commercial Salmon Fishery buyout
	Multiple round reverse auction	Fishers submit sealed bids in first round. Bids ranked, evaluated and offered to lowest bidders. Revised bids sought after information on previous round made publicly available. Revised bids ranked, evaluated and offered to lowest bidders, and so on.	Overcomes information asymmetry. Improved information encourages bids closer to true valuations.	High transactions costs. Requires large number of potential bidders. Costs increase over successive rounds.	British Columbia Salmon Fishery buyout (Box 3)
	Discriminative reverse auction	Fishers submit sealed bids. Agency weights bids according to specified criteria (*e.g.* volume or value of catch history of vessel) to obtain bid score or to evaluate bid. Bid scores ranked and accepted in order from lowest to highest.	Overcomes information asymmetry. Facilitates targeting of buyback.	High transactions costs. Lack of transparency wrt weighting system (if not publicly known). Requires large number of potential bidders.	United States Bering Sea/Aleutian Islands King and Tanner Crab Fishery (Chapter 3)
	Second price reverse auction	Fishers submit sealed bids. Bids ranked and accepted from lowest to highest, but each successful bid paid the amount of the next highest bid.	Overcomes information asymmetry. Reveals bidder's valuations	High transactions costs. Requires large number of potential bidders.	..
	Strike price auction	Fishers submit sealed bids. Bids ranked in order from lowest to highest and accepted up until the desired amount of capacity is reached. All bids then paid the same rate (per unit) as the final accepted bid (the strike bid)	Encourages low bidding in order to be part of the accepted group of bidders	High transactions costs. Subject to collusion. Most expensive of auction systems. Windfall gains.	2001 Northern Ireland decommissioning scheme (see Box
Fixed rate	Fixed rate	Fixed price paid per vessel or permit. Can be done on a first come, first served basis, or targeting particular vessels.	Low transactions costs Transparent	High information requirement for agency to set prices correctly. Potential for windfall gains	Mexico shrimp vessel decommissioning scheme (Box 4)
	Weighted fixed rate	Fixed rate determined according to a formula combining one or more criteria (*e.g.* vessel tonnage or power, catch history, species targeted).	Low transactions costs	High information requirement for agency to set prices correctly. Potential for windfall gains.	French and many EU decommissioning schemes (Chapter 3)

Table 2. Price formation mechanisms in decommissioning schemes (cont.)

Pricing mechanism	Type	Typical format a	Advantages	Disadvantages	Examples
Negotiation	One-on-one negotiation	Negotiations take place directly between fisher and decommissioning agency	Feasible with low number of vessels or permits	Requires symmetrical knowledge. Results in revenue and efficiency losses	NGO buyout in US Pacific Groundfish fishery (Chapter 3)
Independent evaluation		Offer based on third party assessment of value of vessel or permit (e.g. insurance company or scrap dealer). Sometimes offer is a percentage of the assessed value.	Independent and transparent	High transactions costs. Does not reveal reserve prices. Potential for windfall gains.	Iceland buyout under DFF (Box 3)

a. There is a wide variation in the detailed design of these mechanisms, particularly in relation to auctions. The description in this table is intended to be illustrative rather than comprehensive.

Source: OECD.

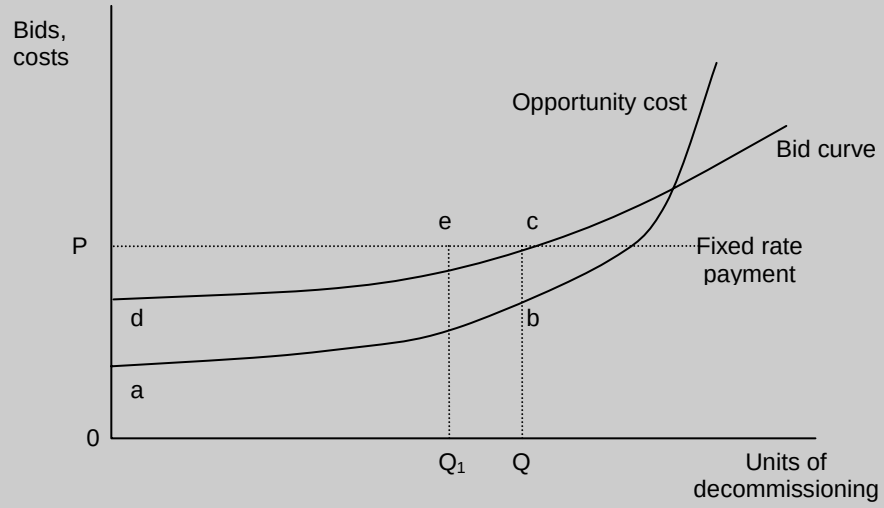
Box 6. Auctions vs fixed rate payments

A bidding model for decommissioning grants can be used to illustrate the effects of information asymmetry on the relative performance of auctions and fixed-rate payments. The model, developed in Latacz-Lohmann and Schilizzi (2005) and Schilizzi and Latacz-Lohmann (n.d.), assumes that fishers are risk neutral, hold private information about their own income from fishing, and use bidding strategies predicated on the belief that the government agency has decided on a maximum acceptable bid or payment level per unit of decommissioning service (a reserve price that is unknown to potential bidders). A fisher will tender a bid if the expected utility from participation in the auction exceeds the expected utility from not participating. It can be demonstrated that the optimal bidding strategy for a bidder will increase linearly with both the bidder's opportunity costs and their expectations about the reserve price. In this way, a bidder's bid will convey information about their opportunity costs and will reduce the information asymmetry, but not completely as the auction's cost revelation property is restricted by the fact that the bid also reflects bidder's beliefs about the reserve price of the agency. This creates room for fishers to bid above their true opportunity cost and thereby secure themselves an information rent arising from the information asymmetry.

This is demonstrated in the figure below. The optimal bid curve lies above the opportunity cost curve up to the point which represents the marginal bidder (beyond which participation in the auction is not optimal). If the agency purchases a given quantity (Q) of decommissioning units under an auction, the total expenditure will be the area under the bid curve from 0 to Q, equal to the area 0dcQ. This will include an information rent, abcd, that will accrue to the fishers due to the agency's lack of knowledge about the true opportunity costs of bidders.

The figure also shows a fixed rate payment designed to purchase Q units of decommissioning (assuming the agency has some knowledge of the bid price at that point). An auction is in principle more cost-effective than a fixed rate payment as the total rent accruing to fishers in this case is aPcb. If the objective of the decommissioning agency was to achieve the maximum buyout of decommissioning units for a given budget, auctions are again cost-effective. For a budget given by 0dcQ, an auction would result in Q units being purchased. On the other hand, a fixed rate auction will necessarily achieve a lower quantity of units (Q_1) as the bid curve will lie everywhere below the fixed rate payment. In the case of multiple round auctions, bidders would be able to learn about the implicit reservation price with each round and extract more rent (the bid curve will rotate upwards and become flatter, increasing the distance between the opportunity cost and bid curves).

Figure 1. Costs of auctions and fixed rate payments



Sources: Latacz-Lohmann and Schilizzi (2005); Schilizzi and Latacz-Lohmann (n.d.).

41. There is a rapidly growing use of auctions in decommissioning schemes in fisheries around the world. This reflects an increased policy interest in using auctions to meet environmental goals in a cost-efficient manner when there is incomplete or asymmetric information, particularly in relation to agricultural land management (Chan *et al.* 2003; Latacz-Lohmann and Schilizzi 2005).[2] In practice, there is a significant variation in the design of auctions within decommissioning schemes, and so auctions need to be carefully tailored to ensure that they provide appropriate incentives in particular situations. Table 2 covers some of the key variants but key issues include whether the auction is single price or reverse auction, uses first-price or second-price principles, has single or multiple rounds of bidding, sealed or open bids, if bids are to be weighted according to certain criteria. For example, the use of discriminative reverse auctions is increasing. Under these types of auctions, the agency running the auction accepts bids but then weights them according to a set of criteria in order to skew the resulting scores towards particular target groups. In the case of the United States Bering Sea/Aleutian Islands King and Tanner Crab Fishery, the bid prices were weighted according to the catch value history of individual vessels in order to ensure that the more active vessels received preferential rankings (see case study in Chapter 3).

42. Three broad issues in the use of auctions in decommissioning schemes are particularly pertinent. First, there is the potential problem of insufficient bidding competition. The smaller the group of potential bidders, the lower will be the level of bidding competition and the higher the likelihood of collusion and strategic behaviour. Such problems may arise in small fisheries, or when the decommissioning body invites tenders for different vessel types or species targeted, with only a small number of vessels in each category. It is exacerbated by the use of eligibility criteria, which further reduce the number of potential bidders. This may reduce the scope for targeting certain segments of the fleet.

43. Second, bidding systems involve the risk of learning on the part of the bidders. Auctions for decommissioning agreements are sometimes designed as sequential auctions where bids for vessels to exit the industry are invited over a sequence of years. For example, multiple round auctions were used in the British Columbia licence retirement scheme (Box 7). Such a system provides scope for fishermen to analyse the results of preceding bidding rounds and use this information to update their bids. In other cases, there may be a process of continuous or regular provision of decommissioning programmes. As these become anticipated by fishers, their bidding strategies are likely to be increasingly guided by what they think they can bid to be accepted rather than their true opportunity costs. The risk of this happening is quite high in 'networked' industries such as fishing, where information is spread quickly through the efficient communication networks of producer organisations or lobby groups. A review of the UK decommissioning auction system noted that fishers were becoming over familiar with the system and that there was a significant amount of learning such that vessel owners found it increasingly easy to project the likelihood of being successful at increasingly higher rates (Nautilus 1997).

44. Third, auctions tend to involve high transaction costs for both fishers and government. To the extent that these are upfront fixed costs, they may deter fishers from participating in the scheme. If a discriminative auction system is used, this will significantly increase the administrative costs for the government as much more time is required to evaluate and weight bids. It also opens up the process for challenges to the legitimacy of the weighting system or target groups that were chosen. This can tend to create a degree of uncertainty about the outcome of the bidding process and future in the industry.

2 . In the United States, for example, the Conservation Reserve Program uses an auction mechanism to award land management contracts to farmers through a competitive bidding process. The land management contracts specify conservation practices that must be adopted by successful bidders in return for payment. Such a system has also been trialled in Australia under the BushTender program in which landholders bid for payments for undertaking conservation activities on their farms (such as maintaining native vegetation and riparian corridors, etc) (Stoneham 2000; Chan *et al.* 2003).

Box 7. The use of auctions in the British Columbia salmon fishery

In 1996 and 1998-2000, two buybacks of licences took place in the British Columbia salmon fishery, following the relative failure of three previous buyback programmes between 1970 and 1993 to adequately control fishing effort and provide for a financially viable fishery. Under the Mifflin Plan, the 1996 buyback programme employed a reverse auction over two rounds to retire a total of 797 salmon licences representing 20% of the fleet, at a total cost of CAD 78.6 million. Area licensing was also introduced for the three different gear types used in the fishery (troll, gillnet and purse seine) in order to reduce congestion externalities in given regions. The 1998-2000 buyback programme was another attempt to rationalize the fishery and used a reverse auction over three rounds to remove licences. This resulted in a total of 1 409 licences being retired (43% of the fleet) at a cost of CAD 195 million.

The use of auctions in the process provided a number of insights into the way in which they hey can have an impact on behaviour. First, fishers generally supported the use of the voluntary reverse auction system in 1996 as it allowed all eligible fishers to enter bids to exit the industry. However, the buybacks had a differential effect on different gear types. This unexpected outcome caused concern amongst fishers about the "corporatisation" of the fishery as purse seiners were predominantly owned by larger fishing companies and this may future allocations of fish between the three gears. As a result, more effort was made in the later rounds of the 1998-2000 buyback to focus on the retirement of seine licences.

Second, multiple round nature of the buybacks increased administration costs, but had the benefit allowing the regulator running the auction to adjust payments to target particular groups of fishers by adjusting the criteria for what bids are accepted and allowing fishers to reformulate their bids. This reduced the strategic behaviour in terms of the offers by fishers and allowed the bids to be closer to their true private valuations. This flexibility also allowed the regulator to retire a much greater portion of the seine fleet in the latest buyback and at a lower cost than would have otherwise have been the case in a single round.

Third, the evolution of prices paid for licences between the buybacks and between the rounds within the buybacks is instructive (see table). The average price increased with over the two rounds of the first programme, but then dropped during the first round of the second programme before rising again. This most likely reflects the learning process following each round within a programme, as well as the fact that the first programme did not effectively reduce effort and so lower bids were able to be accepted a few years later in the second programme.

Table 3. Average prices paid per licence in 1996 and 1998-2000 buyback progremmes

Gear type	1996 Programme		1998-2000 Programme		
	Round 1	Round 2	Round 1	Round 2	Round 3
	CAD	CAD	CAD	CAD	CAD
Seine	405 118	443 475	420 152	432 115	435 578
Gillnet	73 719	84 702	77 880	80 830	84 231
Troll	70 881	82 136	77 532	82 150	85 872
Total licenses retired	396	401	99	645	665

Source: Grafton and Nelson (2005)

Fixed rate payments

45. Fixed-rate payments tend to be much more administratively simple than auctions, thereby reducing transactions costs and improving transparency. Compared with auctions, the fisher's decision collapses from a complex bidding strategy to a relatively straightforward take-it-or-leave-it decision. This reduces uncertainty and resulting transaction costs for both fishermen and the regulatory agency. Fixed rate payments are generally one of two types: payment of a flat rate per vessel or licence; or payment of a weighted fix rate per licence or vessel that is weighted according to specific criteria (such as vessel tonnage or power or target species). Both types of fixed rate payments are also often combined with government evaluation of the applications against specified criteria to help determine whether the bids achieve value for money or meet particular goals (a process sometimes referred to as comparative bidding or a "beauty

contest" (Pratt and Valletti 2001)). Such evaluations can be more or less transparent, depending on how well known and understood are the evaluation criteria by fishers and the extent to which subjective judgement replaces objective evaluation when selection criteria are vague or when arbitrary weights are applied to each criteria.

46. In order for fixed rate payments to be allocative efficient, the information asymmetry between government and industry must not be too great and the objects of the buyout (vessel or licence) must be fairly homogeneous across fishers. This is because the performance of fixed-rate payments is independent of the availability of information on fishers' valuations of their vessel or licence. As a result, overcompensation of "inefficient" fishers is an accepted element of this mechanism. While some attempt can be made to reflect observed market values of vessels or licenses, this will only rarely correspond to private valuations (the opportunity cost curve in Box 6). As a result, fixed rate payment schemes will less allocatively efficient and cost-effective than auctions the more severe are the informational asymmetries, and the more heterogeneous the bidders (in terms of their opportunity costs).

47. The use of flat rate payments is relatively rare. However, it was used in the Mexico shrimp fishery where over 200 vessels were decommissioned in a trial scheme in 2005 (Box 8). In this case, the relative homogeneity of the shrimp fleet made it easier to determine a fixed amount per vessel. Buyback programmes in the Italian clam fishery in 1996 and 2000 provided each voluntarily withdrawn vessel with a lump sum payment of EUR 130 000. Each crew member who left the clam dredging industry received a payment of EUR 6 500 (Spagnolo 2004).

Box 8. Mexico shrimp vessel decommissioning scheme

A recent policy development has been the introduction of a vessel retirement scheme, funded under *Alianza Contigo*. This was introduced into the shrimp fishery in both the Pacific and the Gulf of Mexico in response to a persistent excess of vessels, declining resources and poor profitability. The government initiated vessel retirement at the end of 2004 and the first vessels were retired in 2005. The scheme operated on a voluntary basis and no targeted decommissioning was undertaken. A fixed payment of MXN 100 000 was given for a vessel and its attached permit. The eligibility requirements for the scheme were that the vessel had to have a valid permit, a catch landing document for the immediate prior season (that is, it had to be an active vessel), and no outstanding fines. Staff from the Mexican fishing agency, CONAPESCA, evaluated the bids to ensure that sufficient capacity was being retired from both Mexican coasts. In 2005, 222 vessels were retired under the scheme, representing around 10% of the total shrimp fleet. This was a trial scheme and dependant on future funding to continue. There are plans to extend the decommissioning scheme within the shrimp fishery or to other fisheries.

Source: OECD (2006)

48. The use of weighted fixed rate systems tends to be more common in Europe. Throughout the EU, maximum rates for decommissioning payments are set by the EC on the basis of tonnage. Individual EU countries may then add a further weighting to adapt the buyback applications to meet their particular objectives in terms of fleet or fishery or target species. In France, for example, payments under the 2006 scheme are weighted according to the fish species targeted by the vessels (see case study in Chapter 3). In the 2006 scheme, 100% of the maximum amount of aid is available to French trawlers in the Mediterranean Sea, sole fishers in the Gulf of Biscay, and vessels targeting mostly anchovy, mackerel, horse mackerel and some deep-sea species. In contrast, 80% of the maximum amount of aid is available to vessels targeting nephrops, megrim and hake in some specific ICES area, while the rest of the fleet is eligible to 50% of the maximum of the financial aid.

49. Decommissioning schemes in Denmark have used weighted fixed rates per vessel, but a process of comparative bidding was also used to select which vessels were to be awarded decommissioning grants. This was based on a points system in which applications for decommissioning were weighted according to pre-defined categories such as age of the vessel, species composition in the catch, age of the owner and

fishing days at sea (Nautilus 1997). The relative weightings for each category were varied from year to year depending on the prevailing fisheries management priorities.

Other price mechanisms

50. Other pricing mechanisms that have been used in OECD countries include one-to-one negotiations between fishers and regulators and payments based on independent evaluations. Both these mechanisms may be useful when there are a very small number of potential applicants for decommissioning, when there are specific targets in a small fishery. Independent evaluations may also be useful when there is a perceived need for a higher degree of transparency in the price setting process. In general, though, both these forms of price formation do not solve the information asymmetry problem. Indeed, in a negotiation, the regulator is likely to be at a distinct disadvantage. The mechanisms rate very poorly in terms of cost-effectiveness as they will bear little relationship to the opportunity cost or willingness to receive compensation of fishers. Governments may be in a relatively weak bargaining position as they lack information on fishers' valuations and willingness to be compensated to exit the fishery.

Summary

51. In summary, there is clearly a tradeoff between allocative efficiency and cost-effectiveness (getting value for money) on the one hand, and the administrative and transactions costs of the various types of price mechanisms on the other. Auctions have the highest benefit as a price mechanism when there is a strong information asymmetry between fishers and the government, there is a large pool of potential bidders, and where fishers are heterogeneous in their private valuations. Fixed-rate payments tend to be much more administratively simple than auctions, thereby reducing transactions costs and improving transparency. However, they result in windfall gains for many recipients and will be less allocatively efficient and cost-effective than auctions. These factors need to be weighed in context of the objectives of the scheme, budget constraint, political climate and stakeholder attitudes in individual countries and fisheries in deciding which mechanism is most appropriate.

Conditions on further use of the vessel or licence

52. Decommissioning schemes generally place conditions on the use to which the purchased vessel, licence or gear can be put following the completion of the scheme. Vessels which are not scrapped or forced to cease fishing activity may be used in another fishery which may simply transfer overcapacity problems from one fishery to another while providing a windfall gain to the vessel owners. In OECD countries, vessel decommissioning schemes generally require that vessels be scrapped, put to non-fishing use, or sold to another country. In practice, most vessels tend to be scrapped as there is a limited demand and opportunities for conversion to non-fishing uses; this particular market is relatively small. In addition, the export of decommissioned vessels from OECD countries has declined significantly in recent years as countries have become increasingly aware of the potential for such vessels to end up in IUU fishing activities. In the EU, for example, export of vessels to a third country is no longer regarded as a permanent cessation of activity eligible for public support.

53. The EU regulations governing decommissioning (EC 2792/99) allows for vessels to be sold to countries outside the EU, provided that they never return to EU waters. Maximum premiums for these vessels are 50% less than those for scrapped vessels, and cannot be paid for vessels over 30 years of age. It has been noted that the specific rules governing this aspect of the EU regulation are complex, and that the control mechanisms to ensure vessels do not return to EU waters would not be cost effective (DEFRA 2006).

54. The purchase of licenses generally means that licenses are forfeited and are no longer available for use (by anyone). Situations where vessels are decommissioned but where owners retain a license can be problematic as there remains the possibility that the owners can reinvest in the fishery using their license. This has, in fact, been the case in a number of fisheries (for example, Washington State salmon fishery (Muse 1999)). Retiring both the vessel and the permit/licence is likely to be the most effective strategy.

Role of expectations and moral hazard

55. The role of expectations in undermining the effectiveness of decommissioning schemes has also been the subject of detailed analysis (Munro and Sumaila 2001; Clark *et al*. 2005). Fishers, acting rationally, will come to anticipate government policy in relation to the provision of adjustment assistance and adjust their behaviour accordingly. If the government has a past record of providing decommissioning payments when stocks are declining or there is excess effort or capacity, then the risk faced by fishers in their investment decisions is significantly reduced. As a result, under any type of management regime (even individual transferable quotas), it can be demonstrated that the expectation of future government adjustment assistance will reduce the expected costs of adjustment and result in a higher than optimal level of investment in vessels, with negative impacts on stocks.

56. Not only do decommissioning schemes alter fishers' expectations with respect to investment decisions, they also result in fishers engaging in strategic behaviour to alter the outcomes of the bidding process in their favour. That fishers, as rational economic agents, learn from their experiences is of no surprise. This was noted above in the use of auctions in the UK (Nautilus 1997; Poseidon 2005).

57. Strategic behaviour was also an issue in a voluntary buyback program in Chinese Taipei. Following a first round of buybacks over a period from 1991-95, a second round was instituted in 2000-2005. When the second round was initiated in 2000, only five vessels accepted the price offered by the government of TWD18 000 / GRT (Sun 2006). The government raised the buyback price to TWD50 000 / GRT for vessels smaller than 5 GRT, while the price for vessels over 100 GRT remained the same. There was still little response from fishers, primarily because they were holding out in the expectation of even higher payment schemes being introduced in the future. This prompted the government to change strategy by front-loading prices, particularly for smaller vessels, so that there was a penalty in terms of lower prices for delaying the decision to sell.

58. A number of moral hazard issues also arise in decommissioning schemes.[3] The purchased vessels are frequently older and less productive than the remaining vessels and the decommissioning scheme will accelerate the departure of these marginal vessels that would have departed the fishery in any case. The scheme facilitates and accelerates their exit, generally at a higher price than would have otherwise been achieved. This may encourage fishers from delaying their natural retirement or exit plans in order to benefit from anticipated decommissioning funds.

[3] Moral hazard refers to the possibility that the redistribution of risk (such as in the case of insurance which transfers risk from the insured to the insurer) changes people's behaviour.

Ex-post evaluation

59. Ex-post evaluation of the effectiveness and impact of decommissioning schemes will help to understand whether the expenditures achieved their objectives. Such evaluations are consistent with best practice principles of sound governance. They would also provide useful insights and lessons for the future design and implementation of decommissioning schemes. Ex-post evaluations of decommissioning schemes appear to be conducted on an ad hoc basis with no OECD country having a regular review process in place.

60. Four broad types of ex-post evaluations can be identified. First, national governments occasionally undertake in-depth evaluations of decommissioning schemes. These are typically initiated by fisheries departments in response to concerns over the efficacy of current or past programmes and are intended to help inform future policy choices. Evaluations also can be requested by Treasury and Finance Departments as they have a strong interest in ensuring that public moneys are effectively spent. In 1997, the then UK Ministry of Agriculture, Food and Fisheries engaged a consultant company, Nautilus Consultants, to provide a detailed review of the UK vessel decommissioning schemes that operated from 1993 to 1996 (Nautilus 1997). The report contained a number of recommendations, some of which were taken up in later decommissioning schemes or fisheries management changes. Also in the UK, a mid-term evaluation was undertaken of the UK's use of the 2000-06 FIFG in order to analyse progress on the programme, provide a course of information for the ex-post evaluation of the FIFG (to be completed by 2009, and to prepare for the 2007-13 round of funding under the EFF (Poseidon 2005). This mid-term evaluation included a report on the uptake and impact of decommissioning schemes in the UK from 2000-03. Interestingly, one of the recommendations of the report was that there should be a review of the costs and benefits of vessel decommissioning schemes.

61. Second, national auditors have sometimes focused on specific decommissioning schemes and have conducted in-depth reviews of the effectiveness of the schemes. These usually occur in response to some problems being observed by the auditor with the effectiveness of public spending, or because the government of the day has referred the schemes to the auditor for review. A recent example is the report by the Northern Ireland Audit Office in October 2006 of the 2001 and 2003 decommissioning schemes in Northern Ireland (see Box 9). One of the points made by the Audit Office was that the Northern Ireland Department of Agriculture and Rural Development should have completed its evaluation of the 2001 scheme before introducing the successor scheme. In the United States, the General Accounting Office (the investigative arm of the US Congress) examined the outcomes of three buyout schemes (the New England groundfish, Bering Sea Pollock and Washington State salmon fisheries) (GAO 2000). The GAO recommended that future buyback schemes be designed to; restrict buyback participants from entering a fishery that has excess capacity; restrict the use of unused fishing permits in a buyback fishery with excess capacity; identify mechanisms to minimise incentives to increase capacity in a buyback fishery; and develop and evaluate performance measures for the results of future buyback programmes.

Box 9. Auditing Northern Ireland's decommissioning schemes

Three decommissioning schemes have been employed in Northern Ireland: a UK wide scheme that was run from 1994-98 by the UK ministry for Agriculture, Food and Fisheries; and two schemes in 2001 and 2003 which were run by the Northern Ireland Department of Agriculture and Rural Development. In October 2006, the Comptroller and Auditor General of Northern Ireland tabled a report examining the structure, implementation and impact of vessel modernisation and vessel decommissioning schemes operating in the Northern Ireland's fishing sector. The report had been requested by the House of Commons. One of the factors that motivated the request was the number of legal challenges to the conduct and outcome of the 2001 decommissioning scheme.

The audit report focused on the 2001 and 2003 decommissioning schemes and raised a number of concerns about the conduct and outcomes of the schemes, including:

- Errors in the application of the strike price auction mechanism in the 2001 scheme which resulted in otherwise eligible bids being excluded from the final set of accepted bids and ineligible bids being accepted. This increased the cost of the scheme and reduced the amount of capacity retired below the potential level. It also lead to a series of expensive legal challenges that eventually found against the Department
- Concerns that the strike price mechanism does not provide vaue for money as there is a high likelihood of collusive behaviour amongst fishers.
- "In keeping with best practice, the Department should have completed its evaluation of the 2001 Scheme before introducing the successor scheme" (p. 28).
- A recommendation that the Department considers using "reduction in fishing effort" as one its performance measures in assessing the impact of decommissioning.
- that found that the schemes "generally failed – sometimes quite significantly – to achieve its performance targets, in terms of the level of decommissioning secured and the relative cost" (p, 34).

While the report was highly critical, it highlights the important role that independent evaluation plays in ensuring that programmes provide a net benefit and meet objectives, while providing recommendations for improving te performance of similar schemes in the future.

Source: Northern Ireland Audit Office (2006)

62. Third, evaluations can be undertaken by supranational bodies (such as the EC) or inter-governmental organisations (such s the OECD). The European Commission regularly reviews expenditures under the FIFG on a country basis, although these tend to be reports on the uptake of funding opportunities under the various elements of the FIFG rather than on the effectiveness of particular programmes. Cross-country reviews, such as this report by the OECD, provide valuable information on lessons learned from the experiences of countries and can assist in identifying the advantages and disadvantages of alternative approaches. They do not, however, necessarily substitute for detailed evaluations of programmes at the country level.

63. Finally, the academic community undertakes research on the economic costs and benefits of decommissioning schemes. A glance through the bibliography of this report indicates that academia has been a significant contributor to the body of information evaluating decommissioning schemes. In some cases, this research is supported by governments through research grants. The key advantages of evaluations carried out by academic community are that they are independent and are likely to incorporate leading edge economic analysis and tools. The biggest challenge is to ensure that their findings get incorporated into the policy development process in governments.

3. SELECTED CASE STUDIES OF DECOMMISSIONING SCHEMES

64. This chapter presents a number of case studies of decommissioning schemes from recent experience in OECD and non-OECD economies. The types of schemes vary widely and include examples of mandatory vessel buybacks, ongoing decommissioning schemes, industry-funded buybacks and an NGO-funded permit acquisition. The objective in presenting the case studies is to highlight the lessons learned from the range of experiences in the design and implementation of the schemes. In particular, it is instructive to identify the key factors that influence the success or failure of the schemes in meeting their objectives.

65. The schemes covered in this chapter include:

- Industry-funded buyout in the United States Bering Sea/Aleutian Islands King and Tanner Crab Fishery;
- NGO-funded permit buyout in the United States Pacific Groundfish fishery;
- Australia's Business Exit Assistance scheme under the *Securing our Fishing Future* structural adjustment package;
- Mandatory vessel decommissioning scheme for tuna longline vessels in Chinese Taipei;
- Decommissioning schemes in France; and
- Decommissioning schemes for the coastal and offshore vessels in Korea.

Industry-funded buyout in the United States Bering Sea/Aleutian Islands King and Tanner Crab Fishery

66. This case study presents details of an industry-funded buyout that preceded implementation of an IFQ program in the Bering Sea/Aleutian Islands (BSAI) crab fisheries off Alaska. This fishery is managed under a Fishery Management Plan (FMP) that was developed by the North Pacific Fishery Management Council (NPFMC) under the Magnuson-Stevens Act. The Plan was implemented in 1989, and defers management of the fisheries to the State, with Federal oversight by the National Marine Fisheries Service (NMFS) and NPFMC. The fishery includes seven species of crab, three of which are overfished and under a rebuilding plan. Average annual gross ex-vessel landings over the period 2000-2005 were around USD 135 million. In addition to limited entry, management measures include catch limits, closed areas and seasons, gear restrictions (pot only), catch of males only, and bycatch measures (escape rings/tunnel size, degradable escape), and pot limits.

67. Domestic capacity in the fishery grew rapidly following the exclusion of foreign crab vessels after the declaration of the United States 200-mile EEZ. The fishery was an open access fishery up until a moratorium on the entry of new vessels was proposed by the NPFMC in 1992. Vessels were required to obtain a transferable Moratorium Vessel Qualification which would enable the vessel to later fish when the

moratorium came into effect.[4] The vessel moratorium was approved and finally put in place by NMFS in 1995, and remained in effect until the end of 1999. Up until the introduction of the moratorium, the fishery was an open access fishery with all permits being issued by the State of Alaska. The Olympic nature of the fisheries encouraged a race to fish, with the result that many of the fisheries was subject to an extremely short fishing season (as little as 2 or 3 days in some cases) (Leal et al, 2004). The short seasons forced fishers to deliver all of their catch to processors in a very short period, resulting in a glut of crab on the market and lower dockside prices for fishers. Moreover, the high pace of fishing increased fishing costs, complicated stock assessment and management, and exacerbated dangerous conditions for fishers. The fishery was also heavily overcapitalised.

68. In June 1995, the NPFMC adopted the Licence Limitation Program (LLP) which established criteria for holding a licence, including requisite landings during a specified qualification period (see Table 4 for a history of management initiatives in the BSAI fishery). The LLP came into effect in 1999. Despite the moratorium and the LLP, however, the BSAI crab fishery remained considerably overcapitalised. The Alaska Department of Fish and game, which monitors fishing activity, reports that in 1995, some 299 vessels participated in the crab fishery (portion under LLP), while in 1996 and 1999, the first and last years of the LLP, respectively, 273 and 282 vessels participated. Under LLP and after appeals, there were 288 LLP licences. Clearly the number of permitted vessels as well as the active vessels was not significantly reduced by the LLP.

Design of the decommissioning scheme

69. The industry-funded buyback program was launched in 2001 following passage of legislation (PL 106-554) which directed the Secretary of Commerce to promulgate rulemaking to implement a fishery reduction program.[5] The legislation provided USD 100 million for a loan to the vessels remaining in the fishery. The objective of the program was to increase productivity, help conserve and manage crab resources, and foster the potential for rationalising harvesting effort. The buyback preceded the implementation of an individual fishing quota (IFQ) program. The industry-funded buyout was a useful "jump start" to the IFQ program, providing a smaller universe of vessels with which to conduct the relatively burdensome and participatory process of implementing individual quotas. The buyback itself took place in 2004 with the IFQ program being implemented in 2005.

[4] The Vessel Moratorium Qualification (VMQ) was the prerequisite for obtaining a Vessel Moratorium Permit, which would enable a vessel to fish during the moratorium. The VMQ depended on a vessel's participation history and was transferable, thus acting as an access right for when the fishery came under the vessel moratorium. A market for the VMQs developed during the period before the moratorium (1992-95).

[5]. Note that the NMFS is located within the Department of Commerce.

Table 4. Timeline for management changes in the Bering Sea/Aleutian Islands King and Tanner Crab Fishery

Year	Event
1992	Vessel Moratorium recommended by NPFMC. In addition, the Council approved a problem statement in December 1992 describing the need for and purpose of a Comprehensive Rationalisation Plan.
1995	Vessel Moratorium approved by NMFS and Final Rule implementing Vessel Moratorium published.
	Licence Limitation Program adopted by the NPFMC
1996	First year of fishing under Vessel Moratorium
1997	LLP FMP Amendments approved by NMFS
1998	Final Rule implementing LLP published
1999	Last year of Vessel Moratorium (it was originally to intended to finish at the end of 1998, but was extended a year because the LLP was not ready)
2000	First year of fishing under LLP
2001	Final Rule published to amend the LLP required "re-implementation" of crab LLP eligibility under an FMP Amendment that added a new "recent participation period" as an additional eligibility test for a crab licence. Extant crab LLP licences without requisite history were revoked permanently.
	Consolidated Appropriations Act of 2001 required buyback program (subsequently amended twice)
2002-03	NPFMC adopted a series of Crab Rationalisation measures
2003	Final Rule to establish the buyback program published
2004	Buyback implemented
	NPFMC consolidated all Crab Rationalisation measures into a single Motion, adopted as FMP Amendment 18.
	Congress amended section 313(j) of the Magnuson-Stevens Act through the Consolidated Appropriations Act of 2004. As amended, section 313(j)(1) required the Secretary to approve and implement by regulation the Program, as approved by the North Pacific Fishery Management Council (Council) between June 2002 and April 2003, and all trailing amendments, including those reported to Congress on May 6, 2003.
2005	Last crab fisheries under LLP for rationalized crab fisheries (winter 2005, thereafter some crab fisheries remained under LLP)
	Final Rule Implementing Crab Rationalisation (including IFQ/IPQ system) published
	First rationalized crab fishing year began July 2005 (first fisheries opened August 2005).

Source: National Marine Fisheries Service, personal communication, March 2007.

70. Vessel owners interested in selling out were requested (by official Federal Register notice as well as more popular media processes) to send in their "bids" for exiting the fishery. By submitting a bid, vessel owners indicated the sum of money required for them to surrender all fishing permits and fishing history associated with that vessel, and to ensure that their vessel would never be used in any fishery anywhere in the world. Each bid by a particular vessel was accorded a "bid score" based on the formula which weighted the bid price by the value of catch history for each vessel (Box 10).

Box 10. An example of the bid score system

In the Bering Sea/Aleutian Islands King and Tanner Crab Fishery buyout, each bid by a vessel (say, vessel i) was given a bid score based on the following formula:

Bid score for vessel *i* = bid price by vessel *i* / sum over past five years of gross revenue from vessel *i*

The bid price was the offer made by the seller of vessel *i*. Quantities landed over the past five years by each vessel *i* were obtained from NMFS logbook/landings data, and Alaska state-wide average prices were used (rather than prices received by that particular vessel). The bid score allowed the agency to purchase the most catch history (in terms of value) for the least amount of money. The ratio reflects the fact that a low buyout bid combined with a high history of catch value is preferred over other combinations of bids and so receives preferential treatment in the ranking of bid scores. In the illustrative example given in the table below, vessel C would be preferred even though its bid is higher than that of the other vessels because of its relatively higher performance in terms of catch value. Vessel A would be the next preferred vessel even though vessel D had a higher catch value.

Vessel	Bid price	Total revenue	Bid score
A	200000	280000	0.714
B	200000	265000	0.755
C	350000	500000	0.700
D	350000	480000	0.729

Source: National Marine Fisheries Service, United States; OECD.

71. In a reverse auction fashion, bids were ranked from lowest to highest bid score. Vessels were selected starting with the lowest score, until all USD 100 million of the appropriated funds were exhausted. In the end, NMFS accepted 25 bids totalling USD 97.4 million. These 25 vessels held 62 fishing licences or permits.

72. A post-bidding referendum was held, as required by law, to determine whether all members of the fleet would approve both the buyout and the industry fee system that would be imposed on vessels remaining in the fleet, in order to repay the loan over 30 years. At least two-thirds of qualified ballots must be cast in favour of the buyout in order for the referendum to pass. The referendum did pass, and the buyout was completed. Vessels remaining in the fleet are currently paying a landings fee ranging from 1.9% to 5% (the actual rate varies by region of the fishery) to cover their cost of the buyout. These landings fees are collected by ex-vessel purchasers, and are capped at 5%. During periods when the fishery is closed (*e.g.* in case of resource failure), fees are not collected, although interest continues to accrue on the loan.

73. The interest rate charged on the loan is 2% over the United States Treasury's cost of borrowing equivalent maturity funds, averaged over the year in which the loan program was finalized (7.44% in this case). This interest rate remains fixed over the 30-year term. -The 30-year loan period is specified by law. Annual payments of approximately USD 8.1 million are required to amortize the USD 100 million loan over 30 years at this interest rate.

Outcomes

74. The decommissioning scheme was an interim step between LLP and the IFQ program. An IFQ system was implemented in the crab fishery in March 2005, and the first fisheries under this "rationalisation" program opened in August 2005. Note that this IFQ program was part of a "three-pie system" that included quotas for individual processor (IPQs), harvesters (including crew), and communities, with additional measures to protect coastal communities historically dependent on crab

fisheries. The IPQs are highly controversial, allocating exclusive rights to purchase and process crab at the ex-vessel level. IPQs are legislatively prohibited in all United States fisheries other than this crab fishery. Community quotas are just that — exclusive fishing rights allocated to various small fishing communities in Alaska, including indigenous groups.

75. Active participation in the fishing fleet under rationalisation has definitely declined. In all BSAI king and Tanner crab fisheries except Eastern Aleutian Islands red king crab and Norton Sound red king crab and some other minor fisheries (which remained under State management), 101 vessels were used in the 2005/06 crab fishing year and 89 in the 2006/07 crab fishing year so far (Table 5). These reductions are market-driven as fishing activities are consolidated. Most participants in the IFQ program have joined voluntary harvesting cooperatives under the program's provisions that encourage them to do so; this allows these vessels an exclusion from certain restrictions.

76. There are no reports of any of the decommissioned fishing vessels being scrapped. There is some information regarding their use in non-fishing businesses, as well as scientific research charters. Stripped of their fishing permits as well as the right to participate in fisheries anywhere in the world, the market value of these vessels is quite low.

Table 5. Changes in vessel participation in the Bering Sea/Aleutian Islands King and Tanner Crab Fishery

Year	Event	No of vessels used
1995	Last year before Vessel Moratorium	299
1996	First year of Vessel Moratorium	273
1999	Last year of Vessel Moratorium	282
2000	First year under Licence Limitation Program (LLP) [a]	230
2001		264
2002		250
2003		256
2004	Last full calendar year under the LLP. Buyback implemented.	259
2005		169
2005-06	First year of rationalisation program and introduction of IFQ	101
2006-07	Second year of rationalisation (last fisheries close 31 May)	89

a. Under the Licence Limitation Program, there was a cap in the final number of crab licences of 288 licenced vessels.
Source: National Marine Fisheries Service, personal communication, March 2007.

Lessons learned

77. One of the most positive aspects of the decommissioning scheme was how it served as a precursor to the IFQ program. The buyout essentially set the stage for the rationalisation program by having a smaller fleet, with vessel operators/managers who were better prepared for the rationalisation implementation process, both in thought and by having their catch records at hand (the latter of which avoided some data confidentiality and disclosure problems that always arise in such implementations). By the time the buyout was completed, the NPFMC essentially had a rationalisation plan. Despite these

advantages, the lack of a clear picture of the IFQ program that would follow the buyback hampered somewhat the design of the decommissioning scheme.

78. Industry involvement is an essential part of the formula to a successful transition. In the case of the BSAI crab fisheries, industry was a prime player in the push for the buyback and the shift to IFQs. While the State of Alaska supported the idea as a step towards improving fisheries management, safety at sea and profitability, the major impetus came from industry. The prospect of improved profitability in a rationalised fishery was sufficient to enable those who would wished to remain in the sector to commit to a long period (30 years) of landings fees in order to finance the buyback. The shift to stronger access rights in the form of IFQs was, therefore, an essential element in allowing the fishers to engage constructively in the design and implementation of the buyback.

79. One of the challenges was the lack of clarity in the statutory language that authorized the buyback and the associated loan. The absence of communication between regulators and legislators led to statutory language that was either unworkable, did not address critical issues, or that required substantive and time-consuming legal interpretation. For example, it was necessary to work around the problem that LLP licences were held by persons and not vessels. Delays in analyses and preparation of regulatory documents ensued.

80. Another challenge stemmed from the data confidentiality issue. Under Alaska Statute, fish ticket data (which provided the underpinning data for the buyout) are confidential except to the individual who signed the fish tickets. In many cases the government agency is unable to share underlying data with persons who are entitled to apply for and receive the benefit. This compromises the ability to address inconsistencies in the data, and affects how benefits are distributed. This issue will have to be addressed in the future via changes in statutes concerning confidentiality.

NGO-funded Permit Buyout in the United States Pacific Groundfish Fishery

81. The United States Pacific groundfish fishery is conducted off the coast of Washington, Oregon, and California. The species complex includes 80 species (including 60 rockfish species), of which nine are overfished and under a rebuilding plan. These stocks have traditionally supplied a commercial fishery, a for-hire recreational sector (*i.e.* charter boats) and a private recreational fishery (*i.e.* individuals). All sectors of the fishery have been severely impacted by drastic reductions in fishing effort required for stock rebuilding. Overcapacity is a key issue in this fishery, particularly for stocks that will take a very long time to rebuild (up to 100 years in some cases). Revenues from Pacific groundfish trawling fell from USD 110 million in 1987 to USD 35 million in 2003.

82. Commercial fisheries off the West Coast represent an important impact on marine habitat and biodiversity. Bottom trawling and bottom-tending longline gears are widely used in the groundfish fishery and are likely to have contributed to physical alteration of benthic habitats and a loss of biodiversity. Prior to 2005, there were no systematic habitat protections in place to address these concerns.

83. In 2003, NOAA Fisheries conducted a buyout of the groundfish trawl fishery. The buyout was industry financed with a government loan that is being reimbursed through industry repayment by a tax on landings. The goal of the buyout was to reduce the number of vessels and permits for groundfish trawling and to financially stabilize the fishery and contribute to conservation and management of the fishery. A total of 240 permits were purchased in the buyout from 92 vessels, including permits for groundfish, crab and shrimp. In 2006 there were 179 trawl permits in the fishery. While the buyout did not specifically target habitat protection objectives, it did substantially reduce capacity. Although the buyout was geographically dispersed along the west coast of the United States, some unbalanced and unintended localised effects occurred. For example, in some ports a disproportionate number of permit holders opted

to sell. This has since made it difficult to maintain working waterfronts (processors, harbor fees, etc.) due to reduced economic activity from the commercial fishery.

84. The Nature Conservancy (TNC), and Environmental Defense (ED), two private, environmental non-government organisations, have formed a partnership to use market-based approaches in the conservation of marine resources. TNC, founded in 1951, is expanding from its tradition in the United States of land conservation to work on marine issues in a more comprehensive and systematic manner. Their successful strategies on land include the acquisition and management of natural resources through ownership, easements and leases, and working cooperatively with communities. TNC has moved into the marine environment with the goal of using community-based approaches and transactional expertise to achieve biodiversity conservation objectives, (*e.g.* purchasing or leasing marine or submerged lands to protect habitat). With over 100 marine conservation projects in 22 countries around the world and all coastal United States states, TNC's engagement in the marine environment is increasing around the world.

85. The TNC/ED team is participating in a collaborative effort to develop a local fisheries management strategy for the central coast of California. Central to this collaborative effort has been the participation of fishing industry representatives and community leaders from ports in the central coast of California. The strategy focuses on sustainable harvest, protection of seafloor habitat, and economic stability for the communities of Morro Bay, Monterey, Moss Landing, and Half Moon Bay. The purchase of limited entry trawl permits as a means of offsetting the economic costs of habitat protection is a novel approach, the first of its kind in the United States.

86. During the analysis of essential fish habitat for the Pacific Coast groundfish fishery, the TNC/ED team engaged in a public-private partnership under which private funding was used to purchase groundfish trawl licences and vessels to offset the economic impacts of designating no-trawl zones off the central California Coast (The Nature Conservancy 2006). The no-trawl zones were identified cooperatively by conservation NGOs and members of the affected fishing community and were established through the fishery management process, *i.e.* the Pacific Fishery Management Council (PFMC) (the constituent-based body that develops Fishery Management Plans) as well as NOAA Fisheries (see Box 11).

Box 11. Managing the United States Pacific groundfish fishery

Fishery management in the United States is conducted by both Regional Fishery Management Councils and the National Marine Fisheries Service (NOAA Fisheries) under the legislative mandate of the Magnuson-Stevens Act (MSA) and its 10 National Standards for fishery management. The Pacific Fishery Management Council (PFMC) manages fisheries off the west coast (excluding Alaska) including the Pacific groundfish fisheries. The PFMC prepares the Fishery Management Plans (FMPs) and FMP Amendments, including the groundfish FMP, which was prepared in 11982. Regulatory measures based on these FMPs are prepared by NOAA Fisheries, and these regulations apply to Federal waters and Federally permitted vessels in state waters within the EEZ. In addition to catch limits, the Pacific groundfish fishery is managed through limited entry, gear restrictions, and fishing seasons. The trawl and fixed gear fisheries (longline or fish pot) are subject to limited entry. Because of the multispecies nature of the groundfishery, the need to control harvest of the 9 overfished stocks severely limits the fishing opportunities for the fleet. Bycatch of the more vulnerable species while targeting healthy stocks is a key problem in this fishery.

Source: National Marine Fisheries Service, United States.

Design of the decommissioning scheme

87. Through the partnership, a proposal based on technical analyses was provided to the Councils and NOAA Fisheries by TNC/ED. The project area features estuaries, nearshore rocky reefs, kelp forests, soft and mixed bottom habitats, deep canyons, banks and seamounts. These habitats are characterized by high biological diversity and ecological value to groundfish and therefore protection is likely to be a key

factor in rebuilding these stocks. In addition to a wide variety of marine mammals, seabirds, fish and invertebrate species, this area includes benthic biodiversity peaks in upwelling zones.

88. Through the use of logbook data and community involvement, TNC/ED identified, and began negotiating with, those permit holders who were active in the project area. Deals were negotiated with individual permit holders, although several group meetings were held to provide status reports, explain the general components of the project, design No-Trawl Zones, explain the appraisal process, etc. The purchase price for each permit was based on catch history which varied from permit to permit, rather than a flat rate per permit. This recognised the likelihood that the fishery would soon be managed under an individual fishing quota (IFQ) regime where the quotas would be allocated to each permit holder based on catch history (Squires et al 2006).

89. The effort culminated in 2006 when NOAA Fisheries implemented, through federal regulation, No-Trawl Areas initially proposed by TNC/ED, fishery participants, and community leaders. Essential to the success of this effort was an acquisition agreement contingency that the closures must be secured before TNC would complete the purchase of permits. This contingency provided the Morro Bay fishermen's support to the closure proposal made to the Council. A key strategy employed by TNC/ED has been to partner with the Council and NMFS to encourage their use of the Magnuson-Stevens Act to implement the regulatory components of the project.

Outcomes

90. The outcomes of the project addressed the goals of three distinct groups involved:

- TNC and ED engaged in this effort to address the impact of trawling on representative high-biodiversity areas of seafloor habitat in the central coast. Specifically, TNC sought to reduce by half the number of trawlers fishing in these areas and secure protection of at least 60% of the areas identified by TNC's Ecoregional Assessment of the Central California Coast to be of high biodiversity significance[6].
- The fishing community's goal was to address increasing costs of doing business in the region and to secure the future of the fishery in what they perceive as a threatening regulatory climate.
- NOAA Fisheries and the Pacific Fishery Management Council, as mandated by the Magnuson-Stevens Act, are required to minimise to the extent practicable adverse impacts to essential fish habitat

91. The outcome of the project was to reduce effort in the groundfish fishery by removing six active permits (100% of the permits in the project area), and protecting 3.8 million acres of important habitat from bottom trawling (67% of areas of high biodiversity significance in central California). Four vessels were also purchased as the fishers had no further use for them and needed to sell the vessel in conjunction with their permit. TNC is investigating alternative uses for the vessels, such as oceanographic research, marine debris removal, or marine surveillance and enforcement (The Nature Conservancy 2006). If new owners or uses cannot be found, the vessels will be scrapped. One vessel associated with the acquired trawling permit remained with its owner who had permits in other fisheries (*e.g.* crab, salmon). However, the vessel is legally constrained from bottom trawling for groundfish in the future.

92. The permits purchased through the TNC/ED buyout were not actually retired but are now held by TNC. TNC is investigating strategies to allow fishers to utilise the permits in low impact fisheries. The cost of the buyback is not publicly available due to confidentiality constraints.

6. As defined through The Nature Conservancy's Ecoregional Assessment for the Central California Coast.

93. Another benefit has been the development of a functional collaboration between communities (fishermen, processors, etc.) of central California and the TNC/ED team. This collaboration is continuing to investigate how permit acquisition may be used to leverage additional habitat protection and encourage transformation into more sustainable fisheries. The closed areas proposed through this project were unanimously accepted by the Pacific Fishery Management Council and approved by the Secretary of Commerce to satisfy statutory requirements.

Lessons learned

94. This case study demonstrates that, if done properly, public-private partnerships can work. Key factors to success include a highly participatory, community-based approach, with local conditions driving the planning and decision-making. The Federal mandate was important, but only the NGO investment and community willingness actually led to the permit buyout and trawling closure. The private investment required a guarantee of a "return" which came in the form of the regulatory measures to protect those fishing zones. The localised focus is likely something that federal regulators could not achieve, and yet was essential to successful outcome of the project.

95. The most critical aspect of this innovative engagement of NGOs in a decommissioning scheme is the amount of time and effort invested in a collaborative process. The Pacific groundfish fishery has been subjected to considerable litigation (over a dozen cases) by primarily NGO plaintiffs (other than those engaged in the buyout). It was therefore all the more a challenge for the organisations engaged in the decommissioning scheme to acquire the trust and engagement of the fishing community.

96. Future questions include how and whether the two NGOs will use the permits they have acquired, and if the PFMC will consider alternative approaches. For example, the TNC/ED partners may pursue leasing of these permits for use with habitat-friendly fishing gear. The discussion continues, and will shed light on how non-traditional permit ownership (including potentially IFQs in the future) might be workable in a fishery management context.

Australia's Business Exit Assistance Scheme under the *Securing our Fishing Future* Structural Adjustment Package

97. In November 2005, the Australian government announced a major package of one-off structural adjustment and improved management measures for those fisheries managed by the Commonwealth government.[7] The *Securing our Fishing Future* package addressed the profitability and sustainable future of the industry by seeking to buyout fishing concessions in those Commonwealth fisheries that are subject to overfishing or are at significant risk of over-fishing in the future. The announcement of the package was accompanied by an announcement by the Australian Fisheries Management Authority (AFMA) of significant reductions in allowable catch and effort levels for 2006 and beyond in a number of fisheries, and by the establishment of a Marine Protected Area network in the South-East Marine Region.

98. The centrepiece of the package was a AUD 150 million one-off, capped fishing concession buyout known as the Business Exit Assistance scheme. The scheme involved a voluntary tender process which would allow individual fishing businesses to exit from the industry or to rationalise their business and remain in the industry. In addition to the fishing concession buyout, the structural adjustment package provided for AUD 70 million in complementary assistance for:

7 The Commonwealth government manages those fisheries that are beyond the 3 nm State boundary and has joint management arrangements with a number of States under the Offshore Constitutional Settlement. The Commonwealth fisheries are managed by the Australian Fisheries Management Authority, a statutory authority.

- Business Advice Assistance to assist fishers in obtaining professional advice relating to their financial options under the Business Exit Assistance scheme (capped at AUD 1 500 per concession holder);

- Assistance for Skippers and Crew who lose employment as a direct result of a successful tender under the Business Exit Assistance scheme (AUD 5 000 for skippers and AUD 3 000 for crew);

- Onshore Business Assistance for those onshore businesses that are significantly affected by the structural adjustment (a total of AUD 23 million was available for either onshore business development assistance or onshore business exit assistance);

- Fishing Community Assistance to provide funds for projects aimed at generating new economic and employment opportunities in communities affected by reduced fishing activity as a result of the structural adjustment package, and the establishment of the Marine Protected Area network in the South-east Marine Region (the latter was announced at the same time as the *Securing our Fishing Future* package) (a total of AUD 20 million); and

- AFMA Levy Subsidy and Research under which the government provided AUD 15 million over three years to subsidise the AFMA management fees,[8] as well as a further AUD 6 million for science, compliance and data collection to improve the management of Commonwealth fisheries.

Design of the scheme

99. The Business Exit Assistance scheme involved a voluntary tender process under which Commonwealth fishing concessions were surrendered. Concession holders in all Commonwealth-managed fisheries (except internationally managed and Joint Authority fisheries) were eligible for Business Exit Assistance. However, the following fisheries were particularly targeted due to high levels of current and expected over-capacity and concerns about individual fisher profitability:

- the Southern and Eastern Scalefish and Shark Fishery (excluding the Great Australian Bight Fishery, which was not subject to overfishing);

- the Eastern Tuna and Billfish Fishery;

- the Bass Strait Central Zone Scallop Fishery; and

- the Northern Prawn Fishery.

100. At the beginning of the tender process in June 2006, fishers were advised that a second round of tenders may be conducted at the Government's discretion if the first round of tenders did not meet the Government's objectives, within the allocated budget of AUD 150 million. However, fishers were told that, if they wished to submit a bid, they should not rely on the second round as it may not eventuate. The Department of Agriculture, Fisheries and Forestry (which conducted the tendering process) did not release targets and funding allocations prior to the tender process as this would have distorted the tender process and led to bid engineering. As it eventuated, a second round of tenders was required in November 2006, although only two fisheries were targeted under the second round – the Bass Strait Central Zone Scallop Fishery and the Northern Prawn Fishery.

8 Australia's Commonwealth fisheries operate under a cost recovery regime whereby AFMA levies fees on industry to cover a proportion of the costs of management.

101. Fishers were required to submit a bid based on the price that they believed reflected the amount that they would require to retire the offered fishing concessions. For example, this may have been equivalent in some cases to the amount required to exit the industry, less revenue form selling other parts of their business which could not be tendered under the structural adjustment package. However, the total price of the tender was a matter for each concession holder. Fishers were allowed to submit one or more primary tenders – in cases where they held more than one fishing concession. They were also allowed to submit an alternative tender for each of their primary tenders.

102. While the purchase of vessels was not the target of the Business Exit Assistance scheme, operators could apply for a boat scrapping incentive if they wished scarp any vessels as part of their surrender of fishing concessions. The government paid AUD 25 000 for each boat scrapped where it was part of a successful bid, and that evidence was provided of the boat actually being scrapped in an environmentally responsible manner. In the end, only two operators took advantage of this incentive.

103. In both tender rounds, the Department followed procedures laid out in the request for tender documents (DAFF 2006a, b) and evaluated the tenders based on the total price of the tender and the total number of concessions offered in the tender. Each tender was compared with other tenders that included the same types of fishing concessions and any other fishing concessions that were also included in these tenders. Nominal targets and funding allocations were set for the target fisheries in each round. In this way, value for money was assessed within and between fisheries.

104. The evaluation process was initially undertaken using only primary tenders. Where the reduction targets could not be met using primary tenders, alternative tenders were then also considered. Separate evaluation plans were developed for round 1 and round 2. In accordance with probity requirements (overseen by the Australian Government Solicitor), these plans were finalised and approved before any tender evaluation processes commenced. A computer model was developed to implement the rules of each evaluation plan and this was used to compare the tenders.

Round 1 Evaluation

105. In accordance with the evaluation rules, the Department first tried to achieve all of the reduction targets within the total available funding. To ensure value for money was obtained, there were constraints on the maximum amount that could be spent in each fishery. This recognised the fact that the value of licences varies significantly between different fisheries. These maximum amounts were exceeded by the tenders submitted in round 1, so in accordance with the evaluation plan, the Department moved to the second method of evaluation which evaluated tenders on a fishery by fishery basis. The second evaluation method meant that results could be achieved in those fisheries that were tendered at value for money prices. In the fishery specific approach, the Department determined funding allocations and target reductions for each of the four target fisheries. The Department sought to achieve the reduction target for each target fishery within the nominal funding for that fishery.

106. The need to obtain value for money in the target fisheries was the primary factor in evaluating the tenders. For example, the evaluation process did not give any weighting to: indications by fishers that they intended to leave the fishery; the length of time a fisher had been active in the fishery; whether or not the concession was “active”; offers to scrap a vessel; or tenders that offered to submit many or all of their Commonwealth concessions. However, in the first round, the Department was required to take into account certain preferences in evaluating tenders. For example:

- in all fisheries, primary tenders were preferred over alternative tenders for each operator;

- in the Southern and Eastern Scalefish and Shark Fishery, Gillnet, Scalefish Hook, Shark Hook and Trawl Boat Statutory Fishing Rights (SFRs) were preferred over other concession, and catch landing information was considered;

- in the Eastern Tuna and Billfish Fishery, Longline Permits were preferred rather than Minor Line Permits, and the future value of the concessions in the fishery was a consideration; and

- in the Bass Strait Central Zone Scallop Fishery, the Department preferred operators to surrender all of their Eligible Fishing Concessions in the fishery rather than part of their holdings.

107. All remaining funds left over from the evaluation process in the first round were set aside for Round 2 of Business Exit Assistance.

Round 2 Evaluation

108. There were only two Target Fisheries in Round 2 – the Bass Strait Central Zone Scallop Fishery (BSCZSF) and the Northern Prawn Fishery (NPF) – as targets for these fisheries were not met in the first round. The Department determined funding allocations and target reductions for each of the Target Fisheries. 2, the Department also set indicative prices for each eligible fishing concession. The indicative prices were determined with reference to a variety of information including prices paid for fishing concessions successfully tendered in Round 1, the Gross Value of Production of the fishery and other economic information. The evaluation was then undertaken in three stages:

1. The initial step was to identify the greatest number of surrenders that could be achieved within budget for each Target Fishery without exceeding the indicative price.

2. Once the maximum number of surrenders had been achieved in each of the Target Fisheries without exceeding either the indicative price or the defined pool of funds for each fishery, the remaining funds were directed to the Non Target Fisheries. The Department then undertook the same evaluation process for the Non Target Fisheries (i.e. the greatest number of surrenders that could be achieved within the budget without exceeding the indicative price).

3. When no further concessions could be bought from any fishery without exceeding the indicative price, the best value tenders that slightly exceeded but were closest (in percentage terms) to the indicative prices were identified across all fisheries, until the remaining funds were exhausted.

109. In both rounds of tenders, the Department also considered the impacts from the proposed Marine Protected Area (MPA) network when evaluating tenders. For each impacted operator, a discount factor of up to a maximum of 10% was applied to the tender price for evaluation purposes. The discount factor was calculated by reference to the operator's gross value of production that was affected by the proposed MPAs and the discount factor was applied relative to the operator whose impact was the highest (so that the most affected operator received the maximum discount of 10%). So, for example, if the most affected operator submitted a tender for AUD 100 000, the Department would evaluate that tender as if it was submitted for AUD 90 000 (*i.e.* 10% less than AUD 100 000) and if the tender was successful, the operator would receive the full AUD 100 000. This afforded impacted operators a modest advantage in the evaluation process.

Outcome

110. Tables 6 and 7 provide details of the total number of concessions purchased under the Business Exit Assistance scheme and the total expenditures for each round of tenders, respectively. The first round

of tenders achieved high levels of concession surrenders in two of the target fisheries, the Southern and Eastern Scalefish and Shark Fishery and the Eastern Tuna and Billfish Fishery. The majority of first round of tenders from the Northern Prawn Fishery and the Bass Strait Central Zone Scallop Fishery were not considered to be value for money and thus prompted the Department to focus heavily on these fisheries in the second round of tenders. In the case of the Northern Prawn Fishery, this resulted in 45% and 34% of Class B SFRs and Gear SFRs eventually being purchased, respectively. The buyout in the Bass Strait Central Zone Scallop Fishery resulted in a lower number of concession packages (14%) being surrendered.

111. Of the total budget for the Business Exit Assistance scheme of AUD 148.6 million, around AUD 89.2 million was spent on purchasing fishing concessions in the first round (Table 7). A further AUD 50 000 was spent on boast scrapping. A total of AUD 59.6 million was expended in the second round.

112. It is too early to assess the impact of the Business Exit Assistance scheme on the profitability and sustainability of the target fisheries. Much depends on the management arrangements that were in place, or were put in place, following the buyout of fishing concessions. The scheme focused on retiring fishing concessions, rather than on decommissioning vessels, so the success of the scheme will depend in large part on the ability of the management arrangements to ensure that capacity and effort remaining in the fisheries does not expand following the buyout, particularly in the target fisheries. The capacity of the various fisheries to self-adjust to changing market and environmental conditions is crucial. The target fisheries are subject to a variety of management arrangements. For example, in the East Coast Tuna and Billfish Fishery, there is a shift underway in the management regime towards individual transferable quotas, which is an improvement over the previous regime of regulated open access. The Northern Prawn Fishery is also of interest in that it has been the subject of almost continuous fleet restructuring and capacity reduction since the early 1980s (Newby *et al* 2004). Further changes in the management of the fishery away from input controls will be required to secure ongoing benefits from the buyout.

Table 6. Total number of concessions purchased in tender process in the Business Exit Assistance scheme [a]

Fishery	Type of concession	Total number of concessions in fishery prior to buyback	Quantity of concessions surrendered from Round 1	Quantity of concessions surrendered from Round 2	Total reduction	*% reduction*
Northern Prawn Fishery	Class B Statutory Fishing Right (SFR)	95	7	36	43	45
	Gear SFR	53844	4734	13631	18365	34
Southern and Eastern Scalefish and Shark Fishery	Gillnet Boat SFR	88	26	0	26	30
	Scalefish Hook Boat SFR	122	48	15	63	52
	Shark Hook Boat SFR	30	12	5	17	57
	Trawl Boat SFR	118	56	3	59	50
	Trap Permit / Auto Longline Permit	20	5	3	8	40
	East Coast Deepwater Permit	18	5	3	8	44
	SA Coastal Waters Permit	41	6	11	17	41
	Tasmanian Coastal Waters Permit	82	19	19	38	46
	Victorian Coastal Waters Permit	51	21	7	28	55
	Redfish Quota SFR	586720	112822	0	112822	19
	John Dory Quota SFR	235784	30889	0	30889	13
	Silver Trevally Quota SFR	538740	74912	0	74912	14
	Jackass Morwong Quota SFR	1480633	106064	8808	114872	8
	Royal Red Prawn Quota SFR	485394	103296	0	103296	21
Eastern Tuna and Billfish Fishery	Total Longline permits	218	98	1	99	45
	Minor Line Permits	230	103	9	112	49
Bass Strait Central Zone Scallop Fishery	Packages (Boat SFR [Round One only] + 3500 Commercial Scallop Quota SFRs + 3500 Doughboy Scallop Quota SFRs)	152	5	17	22	14
Other Fisheries	Other permits	~360	20	19	39	11
TOTAL		**~1600**	**>400**	**~150**	**>550**	

a. SFRs refers to Statutory Fishing Rights.
Source: Australian Department of Agriculture, Fisheries and Forestry.

Table 7. Final budget for Business Exit Assistance

Expenditure item	AUD
Round 1 tenders	89,219,466
Round 1 boat scrapping (2 boats)	50,000
Round 2 tenders	59,360,238
Total	**148,629,704**

Source: Australian Department of Agriculture, Fisheries and Forestry.

Lessons learned

113. Funded at AUD 220 million, the *Securing our Fishing Future* package was the largest structural adjustment program ever undertaken in Australia's fishing sector. The government chose to take a "big bang" approach to the adjustment problem, with a strong emphasis in the announcement of the package that this was to be a one-off opportunity for fishers to rationalise their operations or to exit the industry. This is in stark contrast to previous structural adjustment and decommissioning schemes in the sector which were more piecemeal, being undertaken on a fishery-by-fishery basis. While the basic philosophy underlying Australia's Commonwealth fisheries policy since the late 1980s has been on ensuring autonomous adjustment in the sector (generally through the use of economic instruments such as individual transferable quotas), there has been a series of adjustment programs for individual fisheries over the past twenty years. This may have had the effect of altering fishers' expectations regarding the future availability of government assistance in the event of financial difficulty. Whether the big bang approach is sustainable in terms of policy credibility remains to be seen. As was discussed in the previous section, much will depend on the adequacy of the future management arrangements in the sector.

114. A key feature of the structural adjustment package was the emphasis on a holistic package for the fishing sector, encompassing business advice assistance, community assistance and adjustment assistance for onshore businesses that may be adversely affected. This highlights the need to ensure that there is broad community support for the adjustment and reform package. A particular aspect that is noteworthy is the use of the buyback scheme to provide assistance for fishers from numerous fisheries simultaneously and fishers who may be adversely affected by the proposed establishment of an MPA network. This effectively rolled multiple adjustment processes into one measure, as least as far as some parts of the fishing sector were concerned and may have improved the prospects of community support for the MPA network.

115. The highly targeted approach undertaken by the government in determining which bids would be accepted used a combination of market forces and command and control regulation. By obtaining competitive bids, the Department allowed fishers to reveal their willingness to be assisted to leave the sector. However, by selecting successful bids on the basis of pre-declared preferences and considerations, as well as by using Departmental expertise in specific fisheries, the Department was able to achieve its objective of obtaining maximum value for money.

Mandatory Buyout of Large-scale Tuna Long-line Vessels in Chinese Taipei

116. Large-scale tuna long-line fishing vessels have played a significant role in the development of commercial fishing in Chinese Taipei. This section of the industry developed over a period of time,

increasing rapidly during the 1990s due to improved access to markets and logistical support provided by the government. The vessels operated in three oceans and used foreign ports as bases for replenishment of supplies, repairs and transhipment of catch. Some 71 foreign ports have been approved as base ports for fishing activities which made it difficult, at least in part, for effective governance to be applied to the vessels. As a result, Chinese Taipei began to undertake measures to address the issue of vessels complying with the related rules.

117. As early as 1991, Chinese Taipei began conducting fishing fleet reduction programs, at least partly in response to the call for international conservation and management of tuna resources. Since 1991, Chinese Taipei has adopted the policy of limited fishing entry and implemented two voluntary vessel buyback programmes, one in 1991-95 and a second from 2000-05. A total of 2 319 vessels were bought back during the first programme at a total cost of TWD 1 721 million (USD 52.16 million) (Sun 2006). A further 432 vessels were purchased in the 2000-05 program, making a total of 2 751 vessels of various sizes being purchased between 1991 and 2005 (a reduction of 138 698 gross tonnes in capacity). Among the vessels decommissioned were 136 large-scale tuna long-line vessels.

118. The conservation and management of major tuna and tuna-like species is the responsibility of five regional fisheries management organisations (RFMOs): the International Commission for the Conservation of Atlantic Tuna (ICCAT); the Inter-American Tropical Tuna Commission (ITTAC); the Indian Ocean Tuna Commission (IOTC); the Commission for the Conservation of Southern Bluefin Tuna (CCSBT); and the Western and Central Pacific Fisheries Commission (WCPFC).[9]

119. Recent expansion of high seas tuna fisheries in the world has placed significant pressure on some tuna stocks. In some oceans, specific tuna stocks are now at the stage of full exploitation or nearing full exploitation. In particular, global stocks of bigeye tuna show signs of over fishing. This has caused concerns among international fisheries management organizations and ecologists, urging states and RFMOs to manage bigeye tuna stock, and to restrain the harvest of the stock by means of limitation of catch levels or fishing efforts.

120. Owing to market demand, Chinese Taipei's tuna long-line fleet size was larger than necessary to catch the quotas allocated by the relevant RFMOs. The most recent challenge came in November 2005 when ICCAT requested CT to tighten the control of its tuna fishing fleets and cut Chinese Taipei's quota for bigeye tuna from 14 900 tonnes that had applied in 2005 to 4 600 tonnes in 2006, a cut of almost 70% due to non-compliance (ICCAT 2005). The ICCAT decision also called for the mandatory buyback of 160 large scale tuna long-line vessels during 2005 and 2006, as well as further measures to combat IUU fishing.

Design of the decommissioning scheme

121. In February 2005, the Fisheries Agency in Chinese Taipei launched the mandatory vessel reduction programme to purchase 160 large-scale tuna longliners in two phases (in 2005 and 2006). The first phase in 2005 resulted in 59 vessels being decommissioned and their licences cancelled. When target vessels returned to their home port pending their scrapping, they were required to berth at designated docks and their identity was checked and confirmed by the Taiwan Tuna Association and other relevant agencies. Scrapping of the vessels was made under the supervision of personnel from the Taiwan Tuna Association and other relevant agencies, in accordance with the required scrapping procedure. The scrapping process was jointly monitored by the Fisheries Agency and staff of the Taiwan Tuna Association, and, in addition,

[9] Although Chinese Taipei is not a member of the five tuna RFMOs, it has a special "cooperating status" within the organisations and is entitled to fish for tuna underthe condition of maintaining sustainability of tuna stocks.

the China Corporation Register of Shipping was requested to carry out a survey of the process and issue scrapping certificates.

122. The second phase of the program resulted in a further 101 vessels being decommissioned, predominantly focusing on those vessels fishing in the Indian and the Pacific Oceans. In the second phase of the program, to minimize pollution, hydraulic cutting has been used to break the vessels instead of using torch cutting. In view of the pressing time schedule for vessel reduction, it was decided that part of 101 vessels be sunk for use as artificial reefs. In addition, all engines and freezers of these vessels would be destroyed to ensure they could not be reused in fishery.

123. The price for the purchase of the vessels was fixed at TWD 70 000 (approximately USD 1 212) per vessel tonnage. The cost was shared between the government and the industry in the ratio of 3:4 (*i.e* the government contributed TWD 30 000 while the industry contributed TWD 40 000). Half of the industry contribution was paid by the tuna boat owner association with whom the remaining vessels are affiliated, while the other half came from the government in the form of a low interest loan which is to be repaid by remaining vessel owners over a seven year period.

Outcomes

124. Table 8 details the results of the vessel decommissioning scheme. The estimated total cost to the government and industry is TWD 5.6 billion (USD 170 million). In 2005, 59 large-scale tuna long-line vessels were scrapped, among which were 15 vessels were from the Pacific Ocean, 24 vessels from the Indian Ocean and 20 vessels from the Atlantic Ocean. In 2006, 101 vessels were scrapped, including 10 vessels were from the Pacific Ocean, 83 vessels from the Indian Ocean and 8 vessels from the Atlantic Ocean.

125. Overall, Chinese Taipei reduced the size of its tuna longlining fleet by more than 26%. Scrapping of 110 vessels was completed in time and the remaining 50 vessels were sunk for use as artificial reefs before the end of 2006. The total numbers of large-scale tuna long-liners in CT were reduced from 614 to 444 and met the targets imposed.

126. The mandatory buyback will also help to resolve the problem of Chinese Taipei's insufficient quotas for bigeye tuna and ensure that all the remaining vessels fishing for bigeye tuna will have access to sufficient quota to enable profitable operations (Sun 2006). Prior to the buyback, the tuna quota allocations from the various RFMOs were evenly split among all longline vessels which then fished the quotas under a system of seasonal area closures. The reduced number of vessels will improve the profitability, but there may need to be further restrictions to prevent effort creep. An additional benefit is that improving vessel profitability will reduce the incentive for IUU fishing and misreporting of catches.

Lessons learned

127. Pressure from the international community was a major factor driving the mandatory buyout in Chinese Taipei's tuna fleet. It also coincided with a realisation by the Chinese Taipei government that it needed to effectively manage its large fleet operating on the high seas, by means of strict control and verification of catch in order to comply with the conservation and management measures adopted by the international fishery organizations. The buyback programme demonstrated the determination of Chinese Taipei to be regarded the international community as a responsible fishery player. By taking such radical action, Chinese Taipei has ensured a profitable tuna industry can co-exist with compliance with international regulations on the management and conservation of tuna resources.

Table 8. Reduction numbers of large-scale tuna long-line fishing vessels in Chinese Taipei

Ocean	Fishing targets	2005			2006	
		Before Reduction[a] (A)	Reduction numbers (B)	Operational vessels on 1 Jan 2006 (=A-B)	Reduction numbers in 2006 (C)	Operational vessels at start of 2007 (=A-B-C)
Atlantic	Bigeye tuna	90	18	72	8	64
	Part time	10	2	8	0	0
	Albacore	41	0	41	0	49
	Sub-total	*141*	*20*	*121*	*8*	*113*
Indian	Bigeye tuna	208	24	184	73	111
	Part time	78	0	78	10	68
	Albacore	46	0	46	0	46
	Sub-total	*332*	*24*	*308*	*83*	*225*
Pacific	Bigeye tuna	85	15	70	10	60
	Albacore	46	0	46	0	46
	Sub-total	*131*	*15*	*116*	*10*	*106*
Total		**614** [a]	**59**	**545**	**101**	**444**

a. Including 10 vessels retired before 2005.

Source: Chinese Taipei Fisheries Agency.

128. The use of a mandatory, rather than voluntary, decommissioning scheme appears to have been driven by three factors. First, the experience of the previous two voluntary buybacks was not encouraging, particularly as fishers seem to have mastered the strategic game of waiting for the government to raise purchase prices. Second, there was a sense of urgency surrounding the need to reduce the fleet's capacity, flowing from the ICCAT decision. It was abundantly clear that the long-term future of the Chinese Taipei tuna industry depended on a rapid adjustment of fleet size to available fishing opportunities: while there was certainly a high short-term cost, the longer term benefits in terms of international acceptance and possibility of increased fishing opportunities in the future were significant. Third, the demonstration effect resulting from a mandatory buyout sent clear and transparent signals to both domestic industry and the international community about the seriousness with which Chinese Taipei accepted its international responsibilities.

129. This latter point is reflected in proposals by Chinese Taipei to continue strengthening its fisheries management by implementing a six-year program spanning from 2006 to 2011 with a total budget of approximately USD 113 million. The outline of the program includes adjustment of the structure of the fishing industry, continuing to conduct port samplings, increasing observer coverage, data collection, scientific research, and taking measures to deter IUU fishing activities.

Decommissioning Schemes in France

130. The French fishing fleet is one of the largest in the European Union. The vessels mainly operate in the North East Atlantic area as well as in the Mediterranean, harvesting stocks partly shared with the fleets of other EU Member States. A large proportion of the fleet consists of coastal vessels less than 12 metres in length. The French government, like other countries in the European Union (EU), launched fleet capacity management programs in the early 1990s in response to a series of four Multi-Annual Guidance Programmes (MAGPs) that imposed cuts to the allowable tonnage (GRT and later GT) and power (kW) (see Box 12 for an overview of capacity management and decommissioning policy under the EU Common Fisheries Policy). Since 2002, the maximum capacity of EU national fleets is set to a reference level within which governments are free to manage their capacity as they wish, subject to various rules regarding the use of public funds.

131. Decommissioning schemes are a major feature of the capacity management programs in France, starting in 1991 with the "Plan Mellick" which was a program to achieve the objectives for fleet reductions specified under the second MAGP (MAGP II). A succession of decommissioning schemes followed, operating more or less continuously up till the present time. These involved a series of one or two year plans responding to targets under the MAGP III, MAGP IV, the fleet reference level, as well as domestic fishing management priorities. The decommissioning schemes are funded through both the French government and the EU Financial Instrument for Fisheries Guidance and, from 2007, the European Fisheries Fund. In most years, the cost of decommissioning is met almost equally by the EU and the French government.

132. In conjunction with the decommissioning schemes, France relies on a system of limited entry based on the issue of fishery permits (*permis de mise en exploitation* or PME). These licences were allocated to vessels and regions on the basis of specified criteria, but are not necessarily tied to a vessel. A fisher can scrap their vessel and retain the PME, using it in the same or another fishery if they are able to get quota (which is allocated in a hierarchical fashion from the EC to the French government to Producer Organisations and then amongst fishers).

Design

133. The design of decommissioning schemes in France works on the basis of a fixed rate of payment rather than through an auction system. The government sets an overall target for reduction in vessel capacity (in number of vessels, power and length, as well as by target species) and determines an overall budget envelope for each scheme. The government then determines a flat rate (or *premium*) to be paid to vessel owners to permanently remove their fishing vessel from commercial fishing activity. The premium is defined by the administration and is revised for each scheme. The premium is composed of a fixed payment for each tonnage (length?) category plus a variable payment based on the tonnage of each vessel. The fixed payment increases with vessel size while the payment per GT declines as vessels get bigger. The premium level is increased for vessels for which the GT/kW ratio is relatively low and under certain limits. The premium is also varies according to age criterion, consistent with EC regulations. In case of vessel scrapping in the 2006 scheme:

- Vessels between 10 and 15 years old receive the maximum amount;
- Vessels between 16 and 29 years old receive the maximum amount reduced by 1.5% per year the vessel is over 15 years old; and
- Vessels of more than 30 years old receive the maximum amount reduced by 22.5%.

134. Vessel owners who wish to decommission their vessel apply for a grant and priority is determined on a first come, first served basis. Grants are made until the total amount of budgeted financial aid is distributed.

135. To qualify for financial aid, the vessels must be more than 10 years old and have been at sea for 75 days during each of two previous 12-month periods before the application for decommissioning. They also have to be operational vessels of at least 9 meters in perpendicular length or 12 meters in the case of trawlers. Financial aid for vessel decommissioning is only available to the domestic French fleet, and not to the overseas territories. Once accepted for decommissioning, a vessel must be scrapped, used for non-commercial fishing activities, or transferred to non-EU countries (note that vessels with a tonnage under 25 GRT cannot be exported to third countries).

136. The schemes target particular segments of the fleet, differing from year to year in response to priorities determined by the government and, up until the end of the MAGPs, reduction targets externally imposed for different fleet segments. For example, past schemes have targeted:

- Atlantic trawlers of less than 30 meters, dredgers, non-trawlers of more than 12 meters, and Mediterranean Sea trawlers and purse seiners (1998);

- Trawlers of less than 30 meters and Mediterranean trawlers subject to the beam trawl ban by the EC (1999);

- Non-trawlers of less than 12 meters and more than 25 meters, trawlers of more than 30 meters, and specific segments of Mediterranean purse seiners (2000).

Box 12. Fleet capacity targets and decommissioning schemes under the Common Fisheries Policy

From 1983 onwards, a series of programmes called "Multi-Annual Guidance Programmes" (MAGPs) for dealing with overcapacity in the European Community fishing fleet were successively adopted by the European Commission and implemented at a national level by Member States under the Common Fisheries Policy (CFP). While the third set of MAGPs (1992-97) was relatively successful in reducing fleet capacity, the fourth MAGP was not as effective due to the increasing technological of efficiency of fishing vessels outstripping efforts to scrap vessels and limit fishing activity (Cueff 2007). Attempts to tackle the overcapacity problem were also often undermined by the public aid that was granted for the modernization or renewal of the fleet (Surís-Regueiro et al 2003).

The 2002 reform of the CFP removed public aid for the construction of new vessels (from the end of 2004) and introduced a simpler system to limit the capacity of the European fleet. The new system gives Member States greater responsibility for managing their fleet capacity within effort constraints determined by the Council and within fleet capacity reference levels (expressed in terms of number and total tonnage of vessels) set according to the MAGP IV objectives for each national fleet on 31 December 2002. Under the new "Entry/Exit regime", no increase in fleet capacity is allowed and any reduction in capacity achieved with public aid is not able to be replaced. For entries of new vessels between 100 and 400 GT built with public aid prior to the end of 2004, the Member State has to withdraw 35% more capacity than it introduces (CEC 2004).

Decommissioning, or buyback, programmes have been used in most EU countries in order to achieve their target capacity levels. Up until 2006, assistance with funding of decommissioning schemes in the EU was provided through the Financial Instrument for Fisheries Guidance (FIFG) programme, with the Member States sharing the cost of the schemes. In the funding period from 1994-1999, a total of EUR 769.5 million was spent on decommissioning schemes in the EU with the FIFG contributing EUR 462 million (or 60% of the total) (Surís-Regueiro et al 2003). Decommissioned vessels were to be either scrapped or permanently reassigned for non-profitable purposes other than fishing. The FIFG also provided funds for socio-economic measures aimed at easing the transition out of fishing and thereby facilitating capacity reduction. These include providing grants to fishers to allow them to either retrain for activity outside of marine fisheries, or to diversity their activity outside marine fisheries (*i.e.* reduce fishing activity but not cease fishing). For the 2000-2006 funding period for the FIFG, around EUR 520 million of FIFG funds (of a total FIFG budget of EUR 3.7 billion) was earmarked for vessel withdrawal (final data on actual expenditures are not available at this stage).

The European Fisheries Fund (EFF) succeeds the FIFG for the period 2007-2013 and will operate on a similar basis, although there have been some modifications to simplify the management of the Fund. A total budget of EUR 3.8 billion has been allocated to the EFF and it is up to Member States to decide how they allocate their funds between the different priorities of the CFP. Funds will continue to be available for the decommissioning of capacity, as well as for temporary cessation due to emergency measures, retraining and early retirement. The ban on the use of public funding for vessel construction remains in place.

From 2003, the EC set restrictions on the level of compensation that can be paid to fishers for decommissioning their vessels (see table). However, a premium of 20% can be paid (under EC Council Regulation No 2370/2002) for fleet segments that required a reduction of fishing effort greater than 25% to achieve the target effort reductions in fisheries subject to stock recovery programmes. These restrictions on the level of compensation have not been applied under the EFF.

Upper limits on EU contributions to decommissioning grants from 2003

Vessel category (GT)	Upper limit (EUR)
<10	11 000 per tonne + 2 000
10-25	5 000 per tonne + 62 000
25-100	4 200 per tonne + 82 000
100-300	2 700 per tonne + 232 000
300-500	2 200 per tonne + 382 000
>500	1 200 per tonne + 882 000

137. For the 2006 decommissioning scheme, additional aid is given to vessels targeting threatened species. For example:

- 100% of the maximum amount of aid is available to trawlers in the Mediterranean Sea, sole fishers in the Gulf of Biscay, vessels targeting mostly anchovy, mackerel, horse mackerel, vessels targeting some deep-sea species;

- 80% of the maximum amount of aid is available to vessels targeting nephrops, megrim and hake in some specific ICES area; and

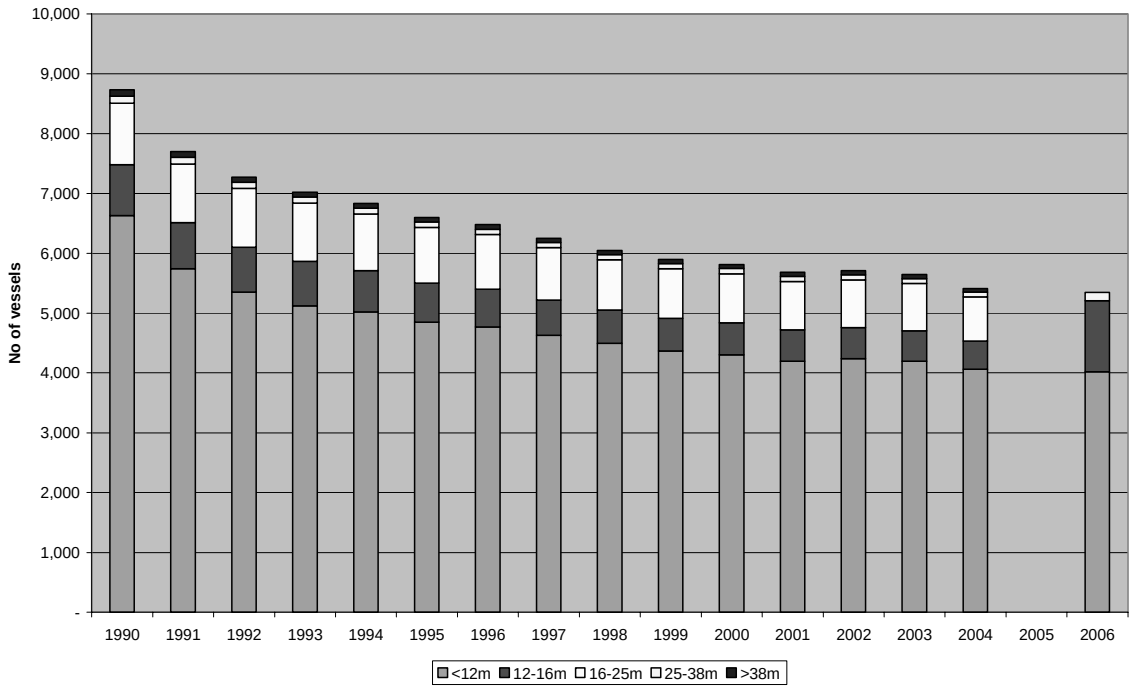
- 50% of the maximum amount of aid for the rest of the fleet.

138. In addition, France has two social schemes that provide fishers with financial assistance when their vessels are decommissioned. An early retirement scheme is available for fishers that do not gather enough annual fees paid to apply for pension scheme but are 50 years old or above (213 fishers have taken advantage of this scheme since 1991). In the second scheme, a special premium is available for younger fishers that provides them with support while they are looking for another job (450 fishers have used this scheme since 1994).

Outcomes

139. The size of the French fishing fleet has declined steadily since the introduction of the decommissioning schemes in 1991, with an average annual decline in the number of vessels of 3% since 1990 (Figure 2). The total tonnage and power of the fleet has also declined (detailed data to come). The biggest decline occurred in the early 1990s as large numbers of vessels took advantage of the decommissioning payments to exit the industry. There has also been a change in the structure of the fleet with many smaller vessels leaving the industry, particularly in the early 1990s (Giguelay 1999; Daurès and Guyader 2000). Many of these vessels were smaller and less powerful than the fleet average and so had the effect of raising the average size and power of the remaining fleet. These vessels were also relatively efficient and uncompetitive and so many vessel owners jumped at the chance to exit. Giguelay (1999) and Daurès and Guyader (2000) also point to the fact that the age distribution of the owners of decommissioned vessels was heavily skewed towards the older age groups, indicating that the decommissioning schemes also served as a *de facto* early retirement scheme for many older owners (particularly in small-scale vessels where there is a high proportion of owner-skippers).

Figure 2. Evolution of the French fishing fleet, by vessel length category [a]



a. Includes only the French domestic fleet and excludes overseas territories.

Source: INSEE and OECD.

140. Detailed data on expenditure for the decommissioning schemes are still being sought from the French authorities and will be included in a further revision of this paper. However, some data are available for recent years. Over the period 2003-2004, the expenditure on decommissioning was EUR 40 million, divided evenly between the FIFG and the French government, and achieved a reduction of 6 200 GT and 25-27 000 kW of power. In 2006, the budget for the decommissioning of vessels is EUR 26 million, of which EUR 13 million is from EU funds and EUR 13 million from the French government. The target fleet reduction is 80 vessels comprising at least 5 500 tonnes GT and 23 300 kW in power, which is around 3% of the reference level.

141. The level of the premiums that are paid to decommission vessels has increased markedly over the years across all vessel categories (Guyader *et al.* 2004). This increase is likely to be due to a combination of factors. First, the early rounds of decommissioning saw inefficient and marginal vessels exit first, leaving more efficient, and hence more valuable, vessels in the fleet. These are, of course, more expensive to decommission and the value of the premiums has risen accordingly. Second, this is reflected in the rising prices paid for sales of vessels, particularly since 1997 when the decommissioning schemes became more targeted. However, the second-hand vessel market serves as an implicit market for PMEs and, in some cases licences, with the value of the vessel accounting for around 50% of the total value. (This is an informal transfer market as such transfers are not formally allowed in France.) In an analysis of the second-hand vessel market and the cost of resource access in Bretagne, Guyader *et al.* (2006) found that the value of the PME and licence for the right to exploit quota (issued by the Department of Maritime Affairs and managed by Producer Organisations) had increased substantially while the value of second-hand vessels had declined marginally.

142. A third factor behind the rising premiums is that the expectations of future government assistance for exiting the industry have been built into the amount that fishers are willing to be compensated for leaving the industry. Acting as rational agents, fishers have learnt to anticipate the buyouts and these expectations have become capitalized in asset values, forcing them up over time.

143. The impact of the decommissioning schemes on the profitability of the remaining fleet is difficult to isolate but, overall, the economic performance of many segments of the French fleet has been declining in recent years. According to recent economic indicators for French fishing fleet over the period 2002-2004, the economic position of eight of the twelve fleet segments for which comparable data on net profits are available has declined over the period (Table 9). The position of the remaining four fleet segments is stable or improving. In particular, the demersal trawl and seine fleet segments have experienced declining net profits and average net profits per vessel. It must be recognized that these indicators do not reflect resource rent in particular fisheries as they are fleet-based rather than fishery-based, and are an accounting, rather than an economic, concept in that they do not include the opportunity costs of labour and capital or the costs of management (Rose *et al.* 2000, Gooday and Galeano 2003). In addition, it is difficult to isolate the effects of the decommissioning schemes from the impacts of other factors that may influence economic performance (such as prices, fuel costs, stock recovery plans, etc). Nevertheless, it is noteworthy that the combination of capacity reduction, in the form of decommissioning schemes, and limited entry to the fishing fleet does not appear to be providing improving economic performance, at least in recent years.

Lessons learned

144. The provision of continuous decommissioning schemes has enabled a smooth and steady adjustment of the French fleet towards the MAGP and reference level targets. The schemes have been progressively modified from 1991 to become more efficient and targeted. The schemes are now targeting vessels fishing more threatened or overexploited species. Such a process of continuous gradual adjustment has clearly involved less short-term social disruption than can result from a "big bang" approach or major fishery-specific structural adjustment initiatives. The labour market has the capacity to adjust more gradually to the capacity reductions, provided that the markets are sufficiently flexible, and unemployment peaks are avoided. This may have been less of a concern for France as a large proportion of the vessels retired have been owned by older fishers who were rapidly approaching retirement. Such a smooth adjustment process has also helped to mitigate potential adverse impacts on social patterns in coastal regions, a key objective in French policy towards the fishing sector.

Table 9. Indicators of economic performance of the French fishing fleet, 2002-04

Fleet segment	Indicator	2002	2003	2004
Demersal trawl and seine (<12m)	Net profit[a]	9.8	3.6	2.3
	Net profit/vessel[b]	26	10	7
Demersal trawl and seine (12-24m)	Net profit[a]	12.4	4.1	-2.3
	Net profit/vessel[b]	20	7	-4
Demersal trawl and seine (24-40m)	Net profit[a]	3.4	2.4	-0.2
	Net profit/vessel[b]	23	19	-2
Demersal trawl and seine (>40m)	Net profit[a]	5	5	4.8
	Net profit/vessel[b]	217	250	300
Pelagic trawl and seine (12-24m)	Net profit[a]	6.2	8.1	6.7
	Net profit/vessel[b]	50	65	57
Pelagic trawl and seine (>40m)	Net profit[a]	25.9	22.3	23.7
	Net profit/vessel[b]	682	587	641
Dredge (<12m)	Net profit[a]	3.1	2.2	2.4
	Net profit/vessel[b]	20	13	15
Dredge (12-24m)	Net profit[a]	4.3	0.3	2.3
	Net profit/vessel[b]	31	2	19
Mobile polyvalent (<12m)	Net profit[a]	2.2	0.3	0.7
	Net profit/vessel[b]	33	5	11
Mobile polyvalent (12-24m)	Net profit[a]	0.2	-13.1	0.3
	Net profit/vessel[b]	6	-385	10
Passive gears (<12m)	Net profit[a]	12.8	23.9	22.5
	Net profit/vessel[b]	5	9	8
Drift and fixed nets (12-24m)	Net profit[a]	6.2	3.6	4.9
	Net profit/vessel[b]	32	20	29

a. EUR million.
b. EUR thousand per vessel. *Source:* Derived from Scientific, Technical and Economic Committee for Fisheries (2006, pp. 67-74).

145. However, the continuous provision of funds for decommissioning is not without its drawbacks. First, many of the owners who did scrap their vessels, and who did not retire, reinvested their aid in more modern vessels (Guyader *et al.* 2004). The fact that the vessel was retired but the PME retained assisted fishers to do this. This was compounded by the provision of financial assistance for vessel construction up until the end of 2004 when such assistance was stopped throughout the EU.

146. Second, the risk adjusted rate of return required for investment in new vessels would be lowered in the knowledge that the continuous adjustment programs that would provide them with financial support in case of economic. Jorgensen and Jensen (1999) have demonstrated that the EU funded buybacks created a stimulus for the expansion of fleet capacity, as well as influenced the behaviour of investors' bankers, who offer better credits than would normally be the case in this situation. If owners were not able to build the regular provision of decommissioning funds into their expectations, they would be reluctant to invest in another fishing vessel whose value is likely to be fluctuating.

147. Third, the continuous provision of funding serves to ratchet up the value of fishing vessels and access rights (PMEs) as expectations of future funding become embedded into asset values. This has a flow-on effect on the price at which vessels are purchased under the schemes. This is reflected in the increasing premiums that are paid under successive decommissioning schemes. Indeed, it is understood that the premiums are now close to the upper limits for decommissioning grants set by the EC (see Box 3).

148. The system of providing a flat rate payment for decommissioning vessels is transparent and administratively simple and is not open to manipulation by fishers or governments. This is especially the case when it is combined with a first come, first served system of granting assistance. This removes the need for the regulators to evaluate applicants (except for due diligence checks such as security of title, freedom from debt and financial liabilities, etc). Whether or not this system is the most suitable for the French situation in terms of providing value for money is open to debate. As discussed in Chapter 2, decommissioning payments should ideally be based on an individual fisher's willingness to receive compensation to leave the fishery. In principle, this is best elicited through an auction process. Based on an empirical analysis of adjustment n the inshore scallop fishery in the St Brieuc Bay, Daurès and Guyader (2000) demonstrate that the fishers' average willingness to receive compensation to leave the fishery was significantly less than the premium paid by the government over the period of the study (1998-2000). This implies that the government actually overspent in this particular fishery and that the exiting fishers made a windfall gain as funds were transferred from taxpayers to the fishers.

Decommissioning Programmes in Korea

149. Since 1994, the government of Korea has undertaken a series of decommissioning programs that are intended to help improve the sustainable management of fishing resources. They were also partly in response to demands from fishers for compensation to cover reduced income due to the loss of fishing grounds as a result of fishery agreements with adjacent countries.

150. The programs can be divided into three phases (Table 1). The ***first phase*** started in 1994 when the Fisheries Administration, a former government organization of the Ministry of Maritime Affairs and Fisheries (MOMAF), recognized the necessity of downsizing the Korean fishing fleet. In the early 1990s, Korea's fishing industry had experienced financial difficulties due to declining fishery stocks in Korea's waters as a result of over-fishing, overcapitalisation of fishing fleets, and large-scale reclamation projects along the coastline.

151. However, the total budget for the program in its early stage was relatively limited and the number of surrendered vessels was quite small, consisting mostly of coastal vessels rather than offshore vessels. In 1999, there was strong demand to expand the program from outside the government. The new fishery agreement between Korea and Japan entered into force in January 1999 and some fisher groups in Korea insisted that their interests were not fully taken into consideration in the negotiation of the agreement. After intensive debate, the Korean government decided to expand its budget for the decommissioning program. At the same time, the government increased the proportion of its direct payment for buying fishing boats which were fishing on grounds that were no longer available due to the agreement. The second part of the first phase therefore focused exclusively on the offshore fleet. This first phase of the decommissioning programs came to an end in 2004.

152. However, prior to the end of the first phase, it became evident that there was a need to further reduce coastal fishing capacity. There had been a year-long discussion in the Presidential Commission on Agriculture, Fishery and Rural Policies on how to sustainably manage coastal fishery resources. In 2002, the Commission recommended the launch of a ***second phase*** of decommissioning program focusing on coastal boats. The relevant government agencies agreed with the recommendation and the program started in 2004 and is due to finish in 2008.

153. While the second phase of decommissioning programs proceeds, new demands for further assistance in capacity adjustment came from the offshore fishing sector. Even though the first phase program was evaluated to have contributed to an increase in the productivity of offshore vessels, fishery resources were not yet fully recovered. In response, the MOMAF launched a comprehensive fish stock recovery program in 2005 and the plan covers various types of resource management methods including further buyback of fishing vessels targeting over-fished stocks. At the same time, free trade agreements with several nations, especially with the United States, played a significant role in invoking fisher's concerns over future profitability in the fishery industry due to further opening of fish market. This created additional pressures for fishers who were already having difficulties due to stock depletion and oil price increases. As a result, many fishers wanted to exit from the industry and requested assistance to do so in the form of additional decommissioning assistance. In 2006, the Korean government decided to start a ***third phase*** of decommissioning programs for offshore fishing vessels which aims to buyback 30% of its offshore fleet (approximately 1 050 vessels) by investing KRW 419 billion. The third phase is due to start in 2007.

Table 10. Brief history of Decommissioning Programmes in Korea

Year	Event
1992	Preliminary research on decommissioning program in Korea by the Korea Rural Economic Institute funded by the Fisheries Administration
1993 (Aug)	The Fisheries Administration decided decommissioning program (period : 1994-2001, target vessels : 6,673, budget : 223.7 billion KRW)
1994	First phase of decommissioning program (1-A) started (priority was given to coastal boats)
1995 (Dec)	1st amendment of the program (period : 1994-2004, target vessels :7,133, budget :314 .6 billion KRW)
1996 (May)	2nd amendment of the program (period : 1994-2004, target vessels : 7,355, budget : 521.4 billion KRW)
1998 (Nov)	Fishery agreement between Korea and Japan signed and entered into force in January 1999.
1999	Decommissioning program (1-B) started
2001 (Jan)	3rd amendment focusing on offshore vessel buyback approved (period : 1994-2004, target vessels : 2,990(mainly offshore boats), budget : 902.4 billion KRW)
2002	Further buyback of coastal boats was suggested by the Presidential Commission on Agriculture, Fishery and Rural Policies
2004	First phase of decommissioning program ended and second phase started
2005 (Dec)	Fishery stock rebuilding program established by the MOMAF
2006	Korea-US Free Trade Agreement negotiation started officially
2007	Third phase of decommissioning program started

Sources: Ministry of Maritime Affairs and Fisheries, Korea Fishers Association, Korea Maritime Institute

Design of the decommissioning scheme

154. The specific designs of the individual decommissioning programs were markedly different and reflected an evolution in the government's approach to program design. The phase 1 decommissioning program actually encompassed two sub-phases, which are designated 1-A and 1-B for the purposes of this case study. The first of these (1-A) started in 1994 and was based on the special law to stimulate the development of rural areas and targeted both offshore and coastal boats. Under this program, vessel owners received two types of payment: one payment was for the depreciated value of the vessel; and the second payment was compensation for business closure.

155. Government funding for the two types of payment differed depending to the type of vessel. In the case of offshore vessels, the depreciated value of the vessel was fully paid by the MOMAF while compensation for the loss of their business was covered by a direct payment from MOMAF covering 50% of the compensation and a government-guaranteed loan (to be repaid by those fishers who leave the industry) covering 30%. The fishers themselves bore the remaining 20% of the cost so that fishers received only 80% of the estimated total compensation for leaving the sector, and 30% of that had to be repaid to the government. In the case of coastal vessels, the payment for owners was met by MOMAF (80%) and local governments (20%). The payment included the depreciated vessel prices as evaluated by professional institutions, and compensation for the loss of business.

156. Under the phase 1-A program, the compensation for the loss of business was evaluated based on the annual average income and cost of a model fishing boat which differed according to the size and type of vessels. However, the evaluation had limitations in terms of accuracy and transparency because the information and statistics on which they were based were not fully documented.

157. Phase 1-B of first phase decommissioning program placed priority on the vessels which used the fishing grounds which were lost as a result of the fishery agreement with Japan. Under this program, the level of payment by the government was increased relative to the 1-A program. While the depreciated value of the boats was fully covered by the MOMAF (as for the 1-A program), the ratio covered by the MOMAF for the closure of businesses increased from 50% to 90%. The burden that had to be borne by fishers decreased from 20% to 10%, and there was no government-guaranteed loan. In addition, unlike the case of the Phase 1-A program, crews who lost their jobs because of the decommissioning program were paid by the government with the payment covering six month's average salary of the crews.

158. The phase 2 program adopted a new system to determine the level of payment. Under the previous system, the valuation of vessels and business losses took too long to determine and implement and resulted in delays to vessel exit and on-going transfer of MOMAF budget to the next year, which was criticized by the Ministry of Budget and the National Assembly. Furthermore, fishers were not satisfied that their previous revenue, which had not been fully reported or collected as data, had not been reflected in the government's payments. As a result, the MOMAF proposed that an auction system serve as an alternative mechanism for determining payments. After a long process of consultation with experts and fisher groups, an auctioning system was adopted to determine the level of payment for the loss of business opportunities. The depreciated value of vessel was still determined and fully paid by the government.

159. The MOMAF budget covered 80% of the total amount of the Phase 2 program while local governments covered the remaining 20%. The local governments were responsible for implementing the decommissioning program under the Ministry's guidelines and the MOMAF channelled the funding through the local governments. In the guidelines, the Ministry describes the broad range of vessel type and standard prices for the payment for depreciated vessels. The local governments then proceed with the auction and decide the final target vessels based on the submitted prices by vessel owners. Once a target vessel is determined, the depreciated value of the boat is assessed by professional institutions. The vessel owner then receives a payment covering the depreciated value of the vessel plus the price the owner bid in the auction process to cover business losses.

160. The most recent decommissioning program (Phase 3) started in 2007 and is focused on offshore vessels. This program is being implemented based on a fixed price system in 2007, although there is a consensus among government agencies (including the Ministry of Planning and Budget) that the program will adopt the auction system from 2008. The details of the auction system for the offshore vessels are not yet settled, although the basic structure will be the same as in the phase 2 system with some modifications. In particular, the MOMAF and other experts are working on how to prevent possible price manipulation by fisher groups due to the small number of vessels in many of the target vessel groups.

161. A feature of all the decommissioning programs in Korea is that the vessel owners must surrender their fishing permit to the government when their vessels are decommissioning. As the government has a fixed ceiling on the number of fishing permits and no longer issues new permits, this results in a decrease in the number of fishing permits in the sector.

Outcomes

162. The phase 1 decommissioning program reduced the number of vessels and licenses significantly. The number of offshore vessels reduced from 6 676 to 3 816 (a decrease of 44%), while the number of licenses declined from 7 944 to 4 456 (Table 2). Even though there were other factors affecting the sharp decrease, it is evident that the decommission program of offshore vessels has contributed to the fishing fleet adjustment.

163. The outcome of the decommissioning program with respect to the coastal fleet is more complicated. While 1 923 coastal vessels were decommissioned under the Phase 1 program, a further 18 000 vessels (approximately) were officially added to the fleet as theses previously illegal vessels were legalised by the government in an effort to bring the coastal fleet under better management. This situation was one of the reasons why the second decommissioning program focused on the coastal fleet.

Table 11. Outcome of the Phase 1 decommissioning program

	Fleet status Dec 1993		No of vessels decommiss-ioned	Changes for other reasons	Fleet status Dec 2004	
	Number of vessels	Number of licenses			Number of vessels	Number of licenses
Offshore vessels	6 676	7 944	1,897	-963	3 816	4 456
Transport vessels	158	97	45	43	156	163
Coastal vessels	46 487	83 592	1 923	17 687	62,251	81 489
Total	53 321	91 633	3 865	16 767	66 223	86 108

Source: Korean Ministry of Maritime Affairs and Fisheries.

164. By the end of 2006, the latest year for which data are available, a total of 5 114 vessels had been decommissioned under both the Phase 1 and 2 programs: 1 942 vessels were offshore vessels and 3 172 vessels were coastal vessels. The central government paid KRW 947.7 billion (approximately USD 1 billion).

165. At least partly as a result of the decommissioning programs, the productivity of the offshore fleet has increased significantly. The average catch per vessel ton increased from 3.5 tons in 1994 to 4.5 tons in 2004. Even though it cannot be evaluated by this single factor, it is clear that the productivity of offshore fishing industry has greatly affected by the decommissioning program.

166. While it is too early to evaluate the outcomes of the phase 2 coastal vessel decommissioning program, there have been several attempts to evaluate the phase 1 program. In one study, Korea Fishers Association and the Korea Maritime Institute found that the financial conditions of six offshore fishing

industries, out of the 14 industries that were analysed, had improved mainly due to the decommissioning program (Korea Fishers Association and Korea Maritime Institute 2003).

167. In another study, 959 former fishers were surveyed on their activities since they surrendered their boats and licenses (Hwang and Eom 2003). About 70% of the fishers surveyed had left the fishing industry while 30 % were still involved in fishing related activities. The latter could be categorized into two groups: one group comprises those fishers who had more than one vessel and were able to continue fishing by using the remained vessel; the second group comprises those fishers who bought a vessel from another fisher and remained in the industry. In this latter case, the fishing permit was transferred with the vessel. Even though the Korean government has set a ceiling on the number of fishing permits and no longer issues new permits, fishers can sell their vessels with the permit. (Most fishers who re-entered into the fishing industry were involving the areas where they were familiar with. This was the case especially to those who were in their late 1930s and 1940s.)

168. Table 12 provides a summary of the key features and outcomes of the Korean decommissioning programs.

Lessons learned

169. The driving forces behind the series of decommissioning programs in Korea originally came from the government and demands from the fishing industry to address the poor financial situation of the sector resulting from over-exploitation of stocks. The agreement between Korea and Japan also played a significant role in the push for assistance to adjust to changing circumstances in the sector. The type and scale of downsizing were determined by the central government based on scientific research and analysis of the productivity, costs and earnings of each particular fishing industry. While the parameters of the programs were basically established by the central government, the programs themselves were implemented by local governments. This was effective in implementing the program in a relatively short period of time. Once this program was evaluated to contribute to the improvement of the financial situation of offshore fishing industries, fishers strongly supported the expansion of the program.

170. The major innovation over the series of programs in Korea was the shift from a fixed pricing system to an auctioning system for determining the amounts to be paid for the closure of businesses as a result of decommissioning vessels. Under the fixed price system, there were concerns over how the precise prices could be calculated given limitations on the information available to the government. The final price may bear little relation to the actual willingness for fishers to be compensated for leaving the industry. This system may well have been more costly than necessary in meeting its targets. This was evidenced by the fact that, by adopting the auctioning system, the Korean government was able to reduce the payment per vessel and shorten the time for implementation. In the case of the coastal vessel decommissioning program in 2006, the number of vessels surrendered (1 249 vessels) was 25% greater than the expected number (1 000 vessels). At the same time, the average payment to each vessel of KRW 42 million was 20% lower than the expected level of KRW 53 million that was included in the budget for the program.

171. It is clear, therefore, that the auction system contributed to improving the efficiency and cost-effectiveness of the decommissioning system, generating cost savings for government and providing an opportunity for a greater number of fishers to benefit from decommissioning payments. Meanwhile, it should be noted that the fishing industry still argues that the government payments are not sufficient for them to exit from the industry because most fishers have debt from banks in purchasing the vessel or fishing gears and, therefore, the payment by the government for surrendered vessel cannot cover the debts. However, under an auctioning system, such concerns can be met by the vessel owners submitting a bid that covers the cost of exit, even though there is a two-part system in place (fixed price for the vessel scrapping and bid price for the business closure).

172. As with the other case studies examined in this report, it is clear that decommissioning programs alone cannot solve overcapacity and overexploitation problems. The re-entry issue is one of the most important issues that the Korean government confronts. Thirty percent of surrendered vessel owners are still involving in fishing industry partly because they had difficulties in finding alternative jobs and partly because the legal system discourages but does not prohibit the purchase of a vessel with permit by recipients of decommissioning payments. In order to minimize re-entry, the Korean government limits the eligibility of vessel owners for participating in decommissioning program: they should hold the vessel and fishing permit at least two years; they should operate the vessels at least 60 days in a year; the vessel should be older than six years in coastal vessels and ten years in offshore vessels; and, most importantly, at least ten years should be passed if the owner had participated in any type of decommissioning program.

173. In addition, the decommissioning programs have been introduced in conjunction with changes in the fisheries management systems for some, but not all, species. From 1998, the Korean government began to introduce a Total Allowable Catch (TAC) system in a number of fisheries. For example, the Korean government is trying to manage its squid resources by adopting the TAC system and downsizing the squid fleet from 2007.

174. Another pertinent lesson from the Korean experience is that different views on the decommissioning program will be a continuous challenge for the government. Fishers tend to consider decommissioning programs as a way of supporting the fishing industry rather than as a policy alternative to manage fishery resources on a sustainable manner. This is one of the reasons why fishers apparently have conflicting attitudes towards the programs. According to a survey done by the Korea Maritime Institute in 2003, fishers showed low satisfaction about decommissioning program, with an average satisfaction score of 2.69 out of a possible 5.0 (the average score of five selected policies surveyed was 3.18). However, in the same survey, the fishers also gave the highest priority to expansion in the decommissioning program when asked about future government priorities in the sector.

175. Finally, attempts to employ the beneficiary pays principle in the funding of the decommissioning programs has met with mixed success in Korea. While the Korean government has recognised the potential usefulness of the principle as a policy tool to better align incentives for the industry and reduce the budgetary cost of decommissioning, the administrative and legal system in Korea is not, at this stage, sufficiently ready to implement it on a wide scale. In addition, further efforts are required to improve fishers' understanding of the principle.

176. Nevertheless, under Phase 1-A program, three offshore large purse seine fleets (each comprising six vessels, including a mother ship, transport ships and lighting ships) stopped fishing from the early 1990s. part of the cost of the vessel surrender was met by the industry through the provision of government-backed loans that were to be repaid by the remaining participants in the sector. This was largely due to the relative ease of specifying and enforcing rights in the offshore sector compared to the coastal sector. This demonstrates that such arrangements are indeed possible if the regulatory institutions are appropriately constructed.

177. The Korean government did, employ a modified version of the beneficiary pays principle in the Phase 1-A program. Thirty percent of the cost of the scheme directed at the offshore fleet (except for the purse seine fleets described above) was met by the industry through the provision of a government-backed loan that was repaid by fishers who left the sector (rather than those who remained). This was likely to have reduced the incentive for fishers to participate in the decommissioning program and this particular mechanism was not used in the subsequent programs

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Table12. Summary of Decommissioning Programmes in Korea

Phase	Phase 1-A (General fleet)	Phase1-B (International fleet)	Phase 2	Phase 3
Purpose	To match the fishing vessel fleet to the level of fishery resources	To cope with the loss of fishing grounds caused by fishery agreements with Japan	To match the fishing vessel fleet to the level of fishery resources	To match the fishing vessel fleet to the level of fishery resources
Legal basis	Special law to develop rural areas	Special law to support to fishers in regards to fishery agreement	Special law to develop rural areas	Special law to develop rural areas
Target vessels /eligibility	Coastal fishing vessels (older than 6 years) and offshore fishing vessels (older than 10 years)	Offshore vessels which have fished in the grounds lost by the agreement	Coastal fishing vessels only	Offshore vessels only
Priority	Vessels fishing over-exploited species. Less competitive vessels		Vessels fishing over-exploited species. Less competitive vessels - purse seine boat, gill netter, etc.	Vessels fishing over-exploited species Less competitive vessels
Period	1994 – 2004	1999 - 2004	2004 - 2008	2007 - 2011
Vessel price	Evaluated by expert institution MOMAF funded 100% for offshore boats	Evaluated by expert institution MOMAF funded 100%	Evaluated by expert institution MOMAF funded 80% Local government 20%	Evaluated by expert institution in 2007, MOMAF funding 50% with remainder from local governments and government backed loan to industry. 2008 funding mechanism yet to be decided.

Table12. Summary of Decommissioning Programmes in Korea (cont.)

Phase	Phase 1-A (General fleet)	Phase1-B (International fleet)	Phase 2	Phase 3
Payment for Business Closure	Annual average revenue × 3 years MOMAF funded 50%, loan 30%, self 20% for offshore boats MOMAF 80%, Local government 20% for coastal boats	MOMAF funded 90%	Auction MOMAF funded 80% Local government 20%	Fixed price in 2007 and auction from 2008
Compensation for unemployment	None	Average monthly payment × 6 months for crew members who lost jobs	None	None
Results/Future Plan	KRW 217.2 billion expended 1,809 vessels decommissioned (1 175 coastal, 634 offshore)	KRW 644 billion 1 308 offshore vessels decommissioned	Total planned expenditure KRW 310 billion and 6 709 coastal vessels decommissioned Expenditure for 2004-2006: KRW 110.4 billion and 2 709 vessels decommissioned	Total planned expenditure: KRW 419.4 billion with 1,050 offshore vessels targeted for decommissioned Planned expenditure in 2007 of KRW 29.4 billion

Source: Ministry of Maritime Affairs and Fisheries, Korea.

4. POLITICAL ECONOMY ASPECTS OF DECOMMISSIONING SCHEMES

178. The performance of decommissioning schemes can best be regarded as mixed. While some schemes have achieved lasting capacity reductions in a cost-efficient manner, other schemes have used less cost-effective means of reaching targets, resulting in a cost to tax-payers. Many schemes, however, did not achieve their objectives in terms of either cost or enduring capacity reductions. The analysis on the economic aspects of decommissioning schemes highlighted a range of Factors that underlie the design and implementation of successful decommissioning schemes and have identified potential pitfalls for policy makers. The selected case studies highlighted the ways in which different countries have responded to particular decommissioning challenges focusing on the motivation for the schemes, design details, outcomes and lessons learned. Taken together, the economic analysis and the case studies underscore the need for careful and considered choices to be made when designing and implementing such schemes, a process that is not always simple or straightforward.

179. However, there appears to be a disjunction between the continued appeal of decommissioning schemes to governments and their relatively poor performance. Much of this can be explained using the political economy framework developed for the fisheries policy reform project. This chapter provides a review of the key political economy factors underlying the use of decommissioning schemes. These include: the drivers for the introduction of decommissioning schemes; the distribution of benefits from the schemes; the use of decommissioning schemes as compensation strategies; and the role of policy credibility.

Drivers for Decommissioning Schemes

180. The push for the introduction of decommissioning schemes has generally arisen from a sense of crisis within a fishery. This is typically a depletion of fish stocks due to open access or regulated open access management regimes and the resulting excess fleet capacity and fishing effort. However, in many cases, the sense of crisis has not been related directly to environmental concerns about the status of the fish stock(s). Rather, the driving force appears to have been economic crisis within a fleet or fishery, with environmental benefits being seen largely as a positive but secondary outcome of the need for adjustment. The two are of course linked, as resource sustainability is a necessary condition for improved profitability.

181. The driving force underlying the development of a coalition amongst industry participants for the introduction of adjustment assistance is likely to be the more immediate problem of poor profitability. But poor economic performance is not necessarily enough to garner consensus amongst participants of the need for policy change: conditions often have to become really bad to encourage a coalition for reform to develop (Drazen 2000). There is a very strong tendency towards the status quo when it comes to fisheries. This is primarily a result of the common property nature of the resource and the existence of exogenous fluctuations in environmental and economic conditions. The prospect of enduring change is also an issue if fishers are to join a coalition for change. Decommissioning schemes are much more likely to gain industry acceptance if the returns from short term adjustment can be assured (if not necessarily guaranteed). This was reflected in the experiences of many countries examined in this report where the use of decommissioning schemes was a precursor to more fundamental reforms.

182. In other cases, the pressures for capacity adjustment are externally imposed. In the case of the EU, for example, resource depletion has been a major factor behind the capacity reductions imposed through the MAGPs (although poor profitability was a more significant factor at national levels). The Chinese Taipei long-line buyback was the product of a decision by an RFMO and as taken up by Chinese Taipei at least in part to assert its international environmental credentials. And in the United States, the TNC/ED buyout of licences in the Pacific groundfish fishery is an example fo how pressure from environmental lobbies can be translated into action.

183. While industry is generally the *demandeur* for a policy concession in the form of adjustment assistance, the government is the supplier. And in this case, the government may also have a significant incentive to join an emerging coalition for such assistance. As noted earlier, one of the major political advantages of decommissioning schemes is that they are a high profile policy intervention that is action-oriented and ostensibly focussed on solving the problem of a declining publicly owned resource. There is, of course, some balancing in the government's calculus in this area as decommissioning schemes are generally very expensive and have to compete with wider government priorities for funding. Nevertheless, the prospect of a "win-win" outcome can be very appealing and support for the provision of decommissioning assistance often ensues.

Distribution of Costs and Benefits from Decommissioning Schemes

184. The distribution of benefits from decommissioning schemes is also significant in explaining the process underlying their design and implementation. In general, these schemes are narrowly targeted to a fishery or fleet. When the buybacks are publicly funded, the costs are thinly spread over society as a whole while the gains are concentrated on a small group within the fishery. There can also be significant regional benefits from the schemes. Even within fisheries in need of adjustment, the distribution of gains between those who leave the fishery and those who stay can determine the strength of the coalition for reform. In addition, there may be some uncertainty about the distribution of gains if it is not clear that the decrease in capacity is going to lead to an improvement in stock status and increased profitability. The management system in place may therefore play a role in the relative bargaining power of those who wish to leave the fishery and those who wish to stay.

185. There is also a time element to the distribution of benefits. Those who leave the fishery immediately as a result of payouts will receive immediate benefits, while those who remain may have to wait for some time for their benefits to be realised, particularly if the fishery was in an overfished condition. The potential delay in benefits for those who remain underscores the importance of effectively managing the remaining effort from expanding or new effort entering in order to sustain support for the decommissioning scheme.

Decommissioning Schemes as Compensation Strategies

186. In many cases, decommissioning schemes have been used as compensation strategy within a larger policy reform process. Indeed, the more successful decommissioning schemes have been introduced as part of a broader package of fisheries management changes focussed on improving the economic and environmental performance of management. This has generally involved the introduction or strengthening of property rights-based management, enabling fisheries to become self-regulating with respect to capacity. They can also help to speed the process of adjustment.

187. It has been demonstrated that decommissioning schemes have the greatest chance of being successful when they are implemented in conjunction with significant management changes. Usually, this has involved the introduction of rights-based regimes which have helped to resist the tendency for remaining vessel owners to increase effort unnecessarily or for new effort to enter the fishery. The

Australian experience in the northern prawn and southern fisheries bears this out. Similarly, Norway's buy-back programs have resulted in improved profits due to the introduction of an individual quota regime under which vessels are tied to the quota.

188. From a political economy perspective, there are two key reasons why governments might provide compensation through decommissioning schemes in the pursuit of broader policy reform. First, governments may seek to overcome resistance to management reforms by providing compensation to those who lose from reform. Compensating transfers in the form of buyouts can be critical in obtaining the consent of affected individuals and groups to management change and allowing the change to take place. They can also be used to drive a wedge between sub-groups within a fishery that may be blocking the management reform. This serves to break down the homogeneity of the group's interests and can increase its coordination costs.

189. Second, compensation can be driven by distributional concerns and can be used to negate the negative effects of change. Decommissioning schemes can provide a means for individuals to exit the industry with dignity and with some return on their investment in the fishery over the years. Because of the low or non-existent value of assets in many fisheries that find themselves in crisis, it is usually not possible for fishers to sell up in order to exit the industry (Clark *et al* 1979). As a result, the government can step in to buy the assets (which may, in fact, be some form of access rights such as licences, but with low or zero value), allowing the fishers concerned to either relocate or retrain. However, providing decommissioning grants in the absence of other policy measures to assist economic diversification may not lead to sustainable social outcomes, particularly in fishery-dependant coastal regions. Similarly, if the payments become integrated into the expectations of fishers, then there is less incentive to find durable solutions to the diversification issue. The consequent impacts on community resilience can be significant and can retard the adoption of necessary adjustments that are triggered by the need for decommissioning schemes. In general, therefore, compensation payments should be temporary and directly targeted to affected groups.

Policy Credibility

190. Fisheries management takes place in a dynamic policy environment where there are feedback loops between government policies and fishers' behaviour. Each is constantly adjusting to expectations about the future actions of the other, meaning that a purely static view of the policy environment will provide only a partial perspective on the issues underlying decommissioning schemes. The signalling and credibility of government policy over time is therefore central to ensuring that fishers receive the appropriate signals for ensuring sustainable and responsible fishing. This is particularly evident in three areas.

191. First, as has been discussed already, the provision of decommissioning transfers has an impact on the risk faced by fishers in their investment and production decisions if they create expectations in the industry that the government will cover losses that may arise from excess investment in vessels. This reduces the risk-adjusted discount rate used in making investment decisions with the result that vessel owners would expect to keep whatever profits result from their investment decisions while being spared the losses resulting from overfishing. This would in general promote overinvestment in the fishing industry. Therefore, the continuous provision of decommissioning payments can significantly reduce the credibility of government policy on the need to find an enduring solution to excess capacity. This can be overcome, or reduced, if a decommissioning scheme for a particular fishery or fleet is announced as being a "one-off" opportunity for adjustment or exit.

192. Second, policy incoherence can significantly undermine policy credibility when it comes to fleet adjustment. A classic example is the co-existence of decommissioning schemes and payments for vessel

construction and modernisation. For the last twenty years, the European Union has had a program[10] in place giving grants to decommissioning fishing vessels. Up until recently, the European Union also provided grants for construction of new vessels and modernisation of existing ones. There is evidence that the decommissioning grants have found their way back into the industry and stimulated investment in new vessels, in which case these grants have in effect become grants to investment (Jorgensen and Jensen 1999; Surís-Regueiro 2003). As part of its package of reforms to the Common Fisheries Policy, support for the construction of new vessels in the EU ceased at the end of 2004, although expenditures under the CFP carried over into 2005.

193. Third, policy credibility is also reduced in cases where decommissioning schemes are employed in fisheries management regimes that do not sufficiently control effort expansion through vessel entry or input stuffing. This will serve to undermine the long-term effectiveness of the decommissioning schemes and reduce the credibility of the policy. Industry observations on the state of fisheries management will be built in to their expectations on future profitability and will do little to reduce effort or increase profitability.

[10] . Or, rather, a sequence of programs where the objectives have been redefined as one program has replaced another.

5. TOWARDS BEST PRACTICE GUIDELINES FOR THE DESIGN AND IMPLEMENTATION OF DECOMMISSIONING PROGRAMMES

194. Decommissioning programmes have been demonstrated to be a useful policy tool in certain circumstances. They can accelerate the transition to a rationalised fishery managed on the basis of stronger use and access rights and improved ecosystem health. As part of a package of transitional assistance and management changes, they can provide a window of opportunity to help transform the nature of a fishery from one characterised by non-cooperative behaviour to one in which incentives are well-aligned and cooperation is the rational outcome of interactions between fishers.

195. However, decommissioning schemes used on their own do not provide a long term solution to the problems of the "race-to-fish" incentive that often arise in fisheries with poorly defined or enforced use or access rights. Unless complementary measures are taken to effectively close access to the fishery, short term gains from the buyback are likely to be eroded as remaining fishers expand effort, previously inactive vessels and licences are activated, or as new entrants join the fishery. Moreover, the provision of continuous, on-going decommissioning funding is likely to result rising vessel and licence prices as expected future resource rent is capitalised into asset values. This will increase the cost of future decommissioning and necessitate a continuous process of exogenous reductions in vessel capacity to offset the effects of effort creep driven by technological change and capital stuffing over the longer term.

196. From a political economy perspective, decommissioning schemes have a role to play in helping to garner support for reform of fisheries management policies. As both an income redistribution mechanism and a compensation tool, decommissioning schemes can assist in reducing opposition to needed policy reforms and overcoming status quo bias. However, caution is needed as the expectation of future financial assistance in times of adverse economic and resource conditions can undermine policy credibility of governments' reform efforts. In this respect, the transitional nature of decommissioning schemes needs to be emphasised.

197. The analysis in this report highlights the fact that the situation facing fisheries throughout OECD and non-OECD economies differs considerably. Such diversity will need to be reflected in the design of decommissioning schemes to ensure that the incentives for fishers and governments are appropriately aligned both during and following the implementation of the scheme. Nevertheless, it is possible to identify a set of broad policy principles that should underlie the design of decommissioning schemes, regardless of the specific fishery and country circumstances. These policy principles are distilled from the analysis and lessons learned from the case studies in this report, as well as from the insights obtained from the expanding body of experience in the use of decommissioning schemes.

Best practice Guidelines

198. The policy principles are presented here as a set of best practice guidelines that identify the key areas that policy makers need to be aware of when designing decommissioning schemes. The guidelines are not intended to be normative but are intended to assist policy makers ask the right set of questions as they develop programmes.

Box 13. Best Practice Guidelines for Decommissioning Schemes

1. Prevention is better than cure

It is usually much easier and less expensive to ensure that management systems are properly designed to prevent overcapacity and overfishing from occurring than it is to undertake capacity reduction after the fact.

2. Clear objectives are essential

Well-defined, clearly articulated and measurable objectives for decommissioning schemes will help ensure that the targets are achievable, that the mechanisms are appropriately specified, and that the full range of management policies for the fishery are coherent and mutually supportive. This also reflects key principles of good governance.

3. Ensure effective post-adjustment management is in place

It is imperative that the management regime in place following the decommissioning effectively prevents capacity from re-entering the fishery. Without such a measure, the beneficial effects of decommissioning will be negated over the medium to longer term.

Improving the specification and enforcement of fishery adjustment plans, including the use of transferable access rights (based on either output or input dimensions), will help ensure that incentives are appropriately aligned and will facilitate autonomous adjustment in the fishery in the future.

4. Decommissioning schemes work well as part of a package of adjustment measures towards sustainable and responsible fisheries

Decommissioning schemes will not, on their own, address the fundamental problems of overcapacity and overfishing.

Decommissioning schemes can be successful in reducing capacity as part of a one-off structural adjustment program where the management regime is also changed to one that provides more security and stability and addresses the market failures leading to the overcapacity problem. The schemes can aid in the transition to a more responsible fishery in which the sustainability and profitability are improved.

5. Getting value for money

Auctions will generally provide the most cost effective means of determining prices to be paid to retire vessels and licences. Under most circumstances, they help address information asymmetries and lead to allocative efficient outcomes.

Auctions can, however, be complicated and costly, and tradeoffs may need to be made between allocative efficiency and transactions costs in choosing between auctions and other forms of pricing such as fixed rate payments.

6. Achieve effective capacity reductions

Both latent and active capacity needs to be targeted to ensure that capacity is effectively reduced and that effort does not become reactivated in the fishery. The sequencing of buyouts may be an important consideration.

7. Require beneficiaries to pay a proportion of the costs of decommissioning

Under the beneficiary pays principle, those vessel owners who benefit from increased resource rent resulting from capacity reductions may be required to contribute to the costs of the decommissioning schemes.

A combination of industry and public funding has worked effectively to reduce the impact on the public coffers while improving the incentives for cooperative management in the post-adjustment fishery.

8. Stakeholder involvement will improve acceptance and compliance

The involvement of stakeholders in the design and implementation of decommissioning schemes will improve the likelihood of cooperation in both the conduct of the schemes and the post-adjustment of the fishery.

9. Undertake ex-post evaluation

Ex-post evaluations of decommissioning schemes, linked to measurable performance indicators developed with the scheme's objectives, can help to ensure that lessons learned inform the design and implementation of future schemes.

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TRADE AND AGRICULTURE DIRECTORATE
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QUOTA ALLOCATION IN INTERNATIONAL FISHERIES

This document is submitted for DISCUSSION and GUIDANCE to the 100th Session of the Committee for Fisheries, 29-31 October 2007, under item 8. 3).

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NOTE BY THE SECRETARIAT

This paper has been developed as part of the Committee for Fisheries project on "Reforming Fisheries Policies". It addresses the issue of governance reform in international fisheries, focusing on the specific issue of quota allocation in these fisheries. The paper summarises the current policy situation with respect to quota allocation in international fisheries and then draws on the experiences of other policy areas facing similar resource allocation challenges (water resources, greenhouse gas emissions) to provide insights into possible avenues for policy reform.

A complementary paper presenting case studies of reform in international fisheries will be presented to the 101st Session of the Committee in April 2008. The Committee may wish to inform the Secretariat of case studies that they wish to see included in that paper. The findings from the two papers will then be drawn together in a synthesis report on governance reform in international fisheries which will be presented to the 102nd Session of the Committee in October 2008.

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QUOTA ALLOCATION IN INTERNATIONAL FISHERIES

Summary

1. Developing an allocation scheme for distributing rights amongst fishing nations remains one of the major obstacles to the development of stable cooperative arrangements to exploit international fish resources.[1] A great deal of effort has been devoted to finding a durable solution to the allocation problem, both at the theoretical and at the applied level. Much of this effort has focused on the insights from game theory to identify the key factors underlying a cooperative solution. The basic requirement to promoting agreement amongst States is to ensure that no State is worse off in acting cooperatively than in acting individually. In the case of international fisheries, agreements must be self-enforcing to be stable as there is no third party to ensure enforcement of the agreement. Issues such as perceptions of fairness and equity in the initial allocation, new entrants, free-riders, optimal resource management in a multilateral setting, and side payments (or "negotiation facilitators") have attracted much attention. Despite these efforts, the allocation problem remains one of the most difficult topics in any fisheries arrangement.

2. However, the fisheries sector is not the only international common property resource that has had to face the policy challenge of allocating participatory rights to users of the resource. This paper examines the allocation experiences associated with water resources and greenhouse gases in an effort to elicit insights that may inform policy makers in the fisheries sector. These sectors share many of the characteristics with international fisheries as governments have had to devise ways in which rights to extract resources or to emit pollutants are to be shared amongst individuals, companies or governments, subject to a maximum level of extraction or pollution. They are also often reliant on the development of self-enforcing agreements to ensure durable cooperative outcomes. There are also a number of key differences with international fisheries including the issue of scale,

3. A number of lessons can be drawn from the experience of these other environmental policy areas that are potentially relevant to international fisheries. The most significant insight is the emphasis in these other areas on the increasing use of market mechanisms to better align the incentives faced by participants. In particular, the use of cap-and-trade systems to improve economic efficiency in combination with more traditional regulatory and planning approaches is a central feature of water use and greenhouse gas abatement policies at both national and international levels. This is in contrast to international fisheries where the use of market mechanisms has largely been absent.

[1]. In this paper, the term "rights" is used in the same sense as in the UN Fish Stocks Agreement and refers to "participatory rights such as allocations of allowable catch or levels of fishing effort" (Article 10(b)). It is a more general concept than the more precisely defined concept of property rights because participatory rights do not necessarily that imply property rights are conferred.

4. The discussion in the paper focuses on:

- the use of historical criteria as a basis for initial allocations for fishery resources;
- the need to ensure that economic efficiency is pursued in the management of international fisheries in order to increase the potential resource rent from the fishery, and hence the size of the potential gains;
- the potential efficiency benefits from allowing the trade or transfer of rights on either a permanent or short term basis;
- the potential for RFMO institutional mechanisms to include differential rights structures that could vary according to member status, length of tenure, tradability, etc; and
- potential mechanisms for strengthening rights and improving transparency and compliance.

1. Introduction

5. The allocation of rights for States and entities to participate in international fisheries remains one of the most difficult problems in fisheries management.[2] Identifying allocation schemes that are perceived as being fair and equitable by all parties that are potentially sharing a resource is necessary to ensure the long run sustainability of the fishery resource.[3] Easy resolution of the allocation issue remains elusive due to the considerable international political economy problems that accompany negotiations on sharing highly migratory and straddling stocks. This was succinctly phrased in a recent report that developed a set of best practices for regional fisheries management organisations (RFMOs):

> "Unlike most of its other activities, the negotiation of an RFMO's allocation of participatory rights, and the outcome, is subjective and highly politicized. There are few quantifiable guiding principles for decisions about allocation, and the effectiveness of those decisions is measured largely by secondary means. … The success or otherwise of an allocation process has the potential to permeate almost all other decisions taken by an RFMO, and thus has the potential either to secure or to undermine the primary conservation regime, but it remains one of the least objectively analysed and structured elements of an RFMO's functions." (Lodge *et al.* 2007, p. 34).

6. The policy challenges in achieving a stable allocation are significant. Catch limitations negotiated at the international level have an impact on national fleets, making it difficult for countries to resist domestic pressure in agreeing to allocations (Hoel and Kvalvik 2006). Issues of how to accommodate new members within existing allocation regimes and to address the aspirations of developing states within an agreement are also major stumbling blocks to garnering agreement. Perceived inequities in the allocation process have been highlighted as a factor in non-compliance with existing national allocations (Lodge et al. 2007). There are also considerable divisions between distinct groups of parties to negotiations, each of which has separate priorities and agendas in any given negotiation (Willock and Cartwright 2006). In particular, coastal states compete with distant water fishing nations (DWFNs) for priority in allocation decisions, while developed and developing countries tend to have a different starting point in negotiations,

[2] International fisheries are defined in this paper as fisheries that exploit highly migratory and straddling stocks. The stocks may therefore occur within the boundaries of one or more coastal states as well on the high seas and are generally exploited by the fleets of one or more coastal nations as well as the fleets of distant water nations.

[3] The existence of equitable allocation schemes is a necessary, but not sufficient, condition to ensure the stability of long term agreements on sharing fisheries resources. As argued by Munro (2006), such agreements must also be self-enforcing if they are to endure.

even though they may have similar longer term objectives. These factors combine to make agreement on a satisfactory allocation paradigm difficult to achieve.

7. However, the fisheries sector is not the only one struggling with the allocation problem. Other resource sectors have also wrestled with the problem of allocating participatory rights amongst current and potential participants in their respective sectors, with varying degrees of success. Examples of other areas with a similar set of policy challenges include water resources, petroleum and mineral resources, timber, carbon dioxide in the context of climate change, and other types of air pollutants such as sulphur dioxide and nitrogen dioxide. In these sectors, governments have had to devise ways in which rights to extract resources or to emit pollutants are to be shared amongst individuals, companies or governments, subject to a maximum level of extraction or pollution. While the parallels with the fisheries sector are not perfect, and in some cases may be only fleeting, it is useful to examine how governments have dealt with the allocation problem in these other areas. These experiences may yield some useful lessons for the fisheries sector that may help to advance the debate in this politically sensitive area.

8. The purpose of this draft paper is twofold. First, the paper reviews the current state of play of allocation in international fisheries, focusing on the key findings from the academic literature and the way in which the allocation problem has been addressed to date. Second, the paper explores the way in which participatory rights are allocated in two areas where the policy challenges are most similar to those confronting international fisheries: water resources; and greenhouse gases. A number of policy lessons for the fisheries sector from these experiences are then discussed in the last part of the paper.

2. The State of Play in the Fisheries Sector

2.1 Insights from the fisheries economics literature

9. A considerable amount of effort has been devoted in the fisheries economics literature to the problem of quota allocation in international fisheries. Much of the effort has focused on the development and application of game-theoretic models to derive the conditions under which self-enforcing cooperative agreements can be developed. Two recent papers by Munro *et al.* (2004) and Munro (2006) provide a comprehensive summary of the current state of analysis in this area. The basic premise underlying the game theory approach is that the key to promoting agreement amongst States is to ensure that no State is worse off in acting cooperatively than in acting individually. In the case of international fisheries, this agreement must be self-enforcing to be stable as there is no third party to ensure enforcement of the agreement. The key findings from these papers can be summarised as follows:

- An essential condition for stability is the **perceived fairness and equity** in the initial allocation. This is because, in the absence of the ability to freely trade national allocations, then it only takes one participant to believe that it has not received an equitable share of the possible returns from the agreement to make it optimal for them to defect and break the cooperative agreement.

- No matter how "fair" the allocation is, **effective enforcement** is required, otherwise it would be optimal for participants to defect before others cheat and reap higher returns (the Prisoners' Dilemma).

- There is a need to ensure optimal resource management over time in order to **maximise the cooperative surplus** (that is, the difference between the sum of payoffs to participants under a cooperative arrangement and the sum of payoffs under non-cooperation). The greater the cooperative surplus, the more participants have to lose from any collapse in cooperation.

- Maximising the cooperative surplus also allows for the use of **side payments**, or "negotiation facilitators" in ensuring that all participants can share in the increased economic returns from optimal resource management.[4]

- The larger the **number of players**, the more difficult it is to achieve a stable cooperative arrangement due to greater enforcement problems and difficulties in reconciling conflicting management objectives. The role of sub-coalitions within a large number of participants is particularly important.

- The need for agreements to be "resilient" in terms of having the **flexibility to respond to external shocks**. This may require the use of side payments to keep participants from defecting in the face of external pressures on the resource stock (such as an El Nino event or climate variability; see Miller 2007). The resilience of many agreements may e hamstrung by the use of quantity allocations rather than proportional allocations (i.e. a share of a total allowable catch).

10. In the special case of **highly migratory and straddling stocks**, the issues raised above are exacerbated by there being a larger number of potential participants to an agreement, uncertainty over the nature of future participants (i.e. new entrants), the determination of "real interest" in a resource, and free-riding by non-participants to an agreement on the resource conservation efforts of participants.

11. The problem of new entrants is particularly vexing as there appear to be few viable options. Two options canvassed in Munro *et al.* (2004) were setting aside quota for prospective new entrants when establishing an agreement, and requiring proportional reductions in existing allocations to allow for new members. Both these options run into free-rider problems and will undermine the viability and stability of an agreement as States will rationally decide that the payoffs from non-cooperation exceed those from cooperation.

12. An alternative option considered by FAO (2002) and Munro (2006) is to allow prospective new entrants to buy quotas from existing RFMO members in much the same way that quota is traded in a domestic fishery managed by individual transferable quotas. While such trading is (arguably) feasible under UNCLOS, UNFSA and the regulations of most RFMOs, it has not been used to any great extent to date (Serdy 2007).

13. One outcome of the focus on game theory to derive allocation mechanisms that provide a "fair" method for allocating rights is the lack of discussion about the concept of efficiency in the design of institutional arrangements for international fisheries, at least in terms of trying to maximise the **economic efficiency** with which the resource is managed. While there is mention made within the regulations of many RFMOs about trying to ensure the resource is used efficiently, this normally refers to the technical efficiency with which the resource is harvested, rather than to trying to maximise the resource rent from a fishery. However, economic efficiency is very important if one of the objectives of an arrangement is to maximise the economic returns from shared resources and thereby contributing to a general increase on social welfare. It will also make the use of side payments or negotiation facilitators more feasible if the fishery actually generates resource rents. A necessary, but not sufficient, condition for maximising economic efficiency would be the ability to transfer quota to those States that valued it most highly. This is discussed further below.

4. Maximising the economic returns from the fishery requires that the management preferences of the participant(s) placing the highest value on the resource predominate in decisions about resource use strategy.

2.2 Allocation in practice

14. A report by MRAG prepared for the Third Regular Session of the Western and Central Pacific Fisheries Commission presents a synthesis of the practical bases for allocation (MRAG 2006). The options can be broadly categorised as:

- Flag State allocation, based on historical catch or effort.
- Area based allocation, based on States' historical catch in their EEZs (also known as zonal attachment).
- Hybrid model based on a combination of area allocation for coastal States based on States' historical catch in their EEZs, and allocation for DWFNs based on their historical high seas catch.

15. Each of the allocation options has theoretical and practical strengths and weaknesses in terms of balancing the interests of coastal States and DWFNs, and in ensuring a stable and efficient agreement. For example, a system based on flag State allocation will tend to favour DWFNs over coastal States. Conversely, area based (zonal) allocation benefits coastal States, but is difficult to incorporate historical high seas catches.[5] The hybrid model will usually represent the negotiated outcome, and will reflect the bargaining powers of the respective parties. More complex allocation mechanisms can be developed involving spatial restrictions on where or how the allocations may be fished, allocations based on distribution of specific stocks, or a staged approach to changing proportions allocated to different parties over time.

16. MRAG (2006) also provides a detailed survey of the experiences of established RFMOs in allocating fisheries resources under their purview. The key findings from the survey are reproduced in Table 1 and underscores the disparate ways in which quota is allocated in existing RFMOs. This largely reflects the particular evolution of each RFMO. However, a number of common aspects emerge:

- Historical catches provide the basis for the allocations in most of the RFMOs, or participation in the fishery in the cases of IATTC and CCAMLR. This reflects the fact that, historically, a "fair" basis for allocation has been regarded as zonal attachment to the stock or historical catch records of the coastal States and DWFNs.
- Allocations are quantity based, either in tonnes or effort levels (number of vessels), rather than being a proportion of a total allowable catch which varies from year to year depending on environmental conditions.
- Allocations are mostly done annually, although the IOTC has plans for a multi-year allocation program. In practice, the annual allocations do not vary significantly as changes have to be agreed by an RFMO's member States and, as a result, do not tend to move very far from year to year.

[5] Zonal attachment has been particularly important for determining eligible participants and their shares in agreements on shared fish stocks (such as between Norway and the European Union for a number of North Seas stocks). Bjorndal and Lindroos (2004) and Hannesson (2007) have shown that fish stock sharing agreements based on the zonal attachment principle need not necessarily be incentive compatible and that side payments (in the form of larger shares for smaller players) may be necessary to ensure a stable agreement.

- There is little room for new entrants with minimal scope for allocating existing quota to new entrants and no (or minima) unused quota available. For example, in the case of the CCSBT, admitting Korea and Chinese Taipei did not involve reductions in quota for existing members.

- The ability of member States to trade and transfer quota is mixed, being expressly forbidden in ICCAT, under consideration in the CCSBT, and allowed but not used in other RFMOs.

17. In relation to actual and potential mechanisms for allowing new entrants to participate in a fishery and accommodating the aspirations of developing States within an agreement, MRAG (2006) noted a number of options. These included:

- Increase the quota above existing levels of quota. This would be counter to the conservation goals of the agreement and would tend to de-stabilise the agreement. However, it has been done in the case of the CCSBT.

- Allow new participants to exploit new or under-developed stocks under the agreement's control. This has been tried on a limited basis in some RFMOs, with limited success.

- Accommodate new Members within existing allocations. This would require existing Members to surrender some quota and would tend to undercut their incentives to maintain a cooperative agreement.

- Allow for quota to be traded (permanently), paving the way for new entrants to buy their way into the agreement and for existing member States to expand their quota holdings if they desire.

- Set aside a proportion of quota as part of the initial allocation that would be used by new participants or developing Member States at a later stage.

18. The Western and Central Pacific Fisheries Convention (WCPFC) is one of the first regional fisheries agreements to be adopted since the conclusion in 1995 of the UN Fish Stocks Agreement (UNFSA). It is useful to review how the Convention has incorporated the lessons from the experience of the more established RFMOs in deciding upon allocation criteria. Article 10(3) of the Convention lists ten factors that must be taken into account in developing criteria for allocation of total allowable catch or total level of fishing effort. These factors are, in fact, rather all-encompassing and include status of the stocks, level of existing effort, historical catches, the special needs of small island developing States, contributions of parties to conservation and management, compliance records, needs of coastal communities, the interests and aspirations of coastal States, and the special geographical situation of island States that dominate the region. The purpose of the MRAG (2006) report was to provide the Commission of the WCPFC with more clarity on options to give effect to Article 10(3); negotiations on the operational implementation of the criteria are yet to be concluded.

19. Finally, the issue of allocation of rights featured strongly in the recent report proposing a model for improved governance in RFMOs (Lodge *et al.* 2007). The report concluded that "[c]ooperative arrangements will only succeed if there are strong negative and positive incentives to comply" with any allocation decisions: agreeing on the allocation process itself is only half the battle (p. 43). The report also concluded that lists of qualitative criteria in convention texts (for example, as in the WCPFC noted above) need to be elaborated upon with the development of explicit, transparent and quantitative allocation criteria, otherwise the default allocation position will inevitably be historical catch.

Table 1. Summary of Major RFMO Approaches to Allocation

Issues	ICCAT	CCSBT	IOTC	IATTC	NAFO	NEAFC	CCAMLR
Data used in making allocation decisions	Stock assessment, historical catch, bycatch	Original allocation basis unknown. Currently based on stock assessment, historical catch.	Gross registered tonnage, but catch data being used to prepare allocation plans	Vessel carrying capacity	Stock assessment, historical catch	Historical catch (and stock distribution in some cases)	Based on applications to fish
Balancing interests of coastal States and distant water fishing nations	Negotiated allocation criteria (balance of interest on a stock by stock basis)	Negotiated on balance of historical catch	Capacity restricted to protect bigeye stock. Preparation of a multi-year plan for allocations.	Longline negotiated on basis of historical catch. Purse seine fish carrying capacities frozen at 2002 levels	Negotiated settlements.	Herring, mackerel and blue whiting are allocated first by coastal States which determine a high seas proportion gven to NEAFC. NEAFC allocates this high seas portion to non-coastal States.	TACs are determined by CCAMLR for areas under national control, but allocation not specified. Coastal States have right of veto.
Accounting for new entrants and aspirations of developing country members	Set aside portion of quota for developing countries. Small unassigned albacore quota pool. BFT quota offered to UK and France to join ICCAT.	Small unassigned quota pool in 2003. Korea and Chinese Taipei offered allocation as Members.	Allowed smaller fleets to expand within a development plan submitted to IOTC	Exemption for developing fleets from capacity limits on major fleets.	Quotas fully allocated, but non-Members can accede to NAFO. Limited fishing opportunities for new members within “Others” categories.	Small quota (0.3%) for redfish (the only fishery primarily controlled by NEAFC) set aside for cooperating non-contracting parties	Harvesting restricted to current Members. New entrants discouraged.
Cases where compliance is used to determine allocations	Allocations for non-Contracting Parties to join or gain cooperating status. Notifications and sanctions for violators. Penalties for violating Members.	South African allocation reduced due to non-compliance. Japanese allocation reduced for 5 years following overcatch.	Compliance committee reviews applications for cooperating status	Removal of a vessel from register of fishing vessels, affecting the fishing capacity of a nation.	Quota reductions in subsequent periods to deal with over-runs.	Nation can become cooperating non-contracting party is compliance record is good and has not engaged in IUU fishing.	List of IUU vessels. These cannot participate in exploratory fishery. Poor compliance by existing vessel may lead to being lpaced on IUU list.
Tradability or transferability of allocations between Parties	No Member may sell or trade quota. Exchanges are allowed.	No trade or transfer allowed. Under consideration.	No trade or transfer allowed. ?	?	Quota transfer allowed.	Quota transfer allowed.	Trade or transfer of quota not explicitly prohibited, but not undertaken.

Source : Based on MRAG (2006, p. 29) and Serdy (2007).

3. Experience from Outside the Fisheries Sector

20. As was noted in the introduction, other sectors have struggled with the problem of allocating participatory rights to current and potential participants in their sectors. This section examines the allocations experiences in two areas: water; and carbon dioxide.[6] These policy areas have characteristics and face policy challenges that have particular resonance with the fisheries sector in relation to the allocation problem. It should be noted at the outset that it is not the intention in this paper to provide a detailed review of the allocation and distribution processes in each of these other areas. Rather, the key insights from the literature and experiences will summarised in order to draw some potential insights for the fisheries sector.

21. In reviewing the experiences of the other sectors, the following key policy issues of particular relevance to the fisheries sector will be addressed:

- Basis for allocations;
- Balancing of interests of various groups;
- Dealing with new entrants or expansion;
- Ensuring compliance; and
- Tradability of rights.

3.1 Water resources

22. The allocation of water resources between users has many similarities with the allocation of rights to exploit fish stocks. Water is a highly mobile, renewable (but potentially exhaustible) resource that often crosses international or legislative borders, raising complicated issues of control, jurisdiction and sovereignty. Water availability is often subject to a degree of uncertainty due to external factors and there is a growing scarcity of, and increasing competition for, water in many countries. The search for an equitable and efficient solution to allocation within and between user groups (such as farmers and towns) is hampered by the existence of historical usage rights that are often deeply embedded in the political systems of countries. It is also hampered by the problem of directional externalities within a water system whereby the activities of one user (individual, group, or country) will have an impact on other users elsewhere in the system. In addition, countries that access the water flow first may fear that an agreement to share the water may limit their political and economic options in the event of a water shortage (Giannias and Lekakis 1997).

23. There are also some crucial differences. For example, it is much more technically feasible to measure water stocks and flows (at least for surface water, less so for groundwater) than it is to measure fish stocks. At the national level, rights and allocations can be legally enforced through a country's judicial system. In contrast, at the international level, there is a need to develop self-enforcing agreements as there is no international enforcement agency. At the same time, the problem of new entrants does not arise at the international level as the number of States sharing a water system is fixed (although it may well be an issue at the national level). The policy solutions to the allocation problem differ significantly between the international and national levels.

[6]. Other sectors such as timber, minerals, and oil and gas are not discussed in this paper. While they are also common property resources, they generally lack the multilateral dimension of international fisheries and are characterised by relatively well-defined and enforceable property rights that considerably simplify the allocation problem.

International level

24. At the international level, the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, adopted in 1997, provides a framework for negotiations between countries sharing an international water resource. Although the Convention is not yet in force (it has only 26 of the necessary 35 signatures), it provides an indication of how the international community approached the allocation challenge in this case. The Convention defines the obligation not to cause appreciable harm and the right to reasonable and equitable use as co-equal criteria for the allocation of water between riparian countries. As is the case with UNCLOS, UNFSA and the RFMO conventions, these criteria have to be translated into an operational algorithm through negotiations between countries. In principle, the main criteria advocated for allocating water are based on either country's relative shares of the catchment area or the relative size of their populations (van der Zaag *et al.* 2002). This is similar to the historical catch criterion that predominates in the case of fisheries.

25. In practice, however, international water resources tend to be managed on a bilateral or multilateral basis through the establishment of treaties between countries sharing the water system, almost all of which were established prior to the adoption of the UN Convention.[7] Examples of countries developing agreements to allocate water resources are largely confined to the word's major river systems (Giannias and Lekakis 1997; Kliot *et al.* 2001) Some of these treaties and agreements are designed to allocate water between States (*e.g.* the Indus, Nile, Ganges and Jordan). The agreements tend to be very general and call for the optimum use of shared water resources without providing practical guidance on allocation which is then decided in political negotiation. The allocation of water between countries is generally a negotiated outcome based on geographical, political and historical criteria and do not vary significantly from year to year.

26. One of the features of negotiations on these agreements and treaties is the strong emphasis on an equitable distribution of resources. However, there is little agreement on what is meant by equity. Moreover, the international law on international watercourses contains a number of different and conflicting principles which are espoused by watercourse states depending on their position on the watercourse.[8] The establishment and assignment of rights is then inevitably bound up with the distribution of power among states along the watercourse. Indeed, in most cases, the basis for allocation between countries is mired in political and social history and reflects a political outcome rather than anything based on measurable criteria (see Just and Netanyahu 1997). As a result, their main functions of these agreements tend to be maintaining the status quo, avoiding conflict, and providing a dispute settlement venue (Kliot *et al.* 2001).

27. For example, the International Boundary and Water Commission has responsibility for applying the rights and obligations contained in the boundary and water treaties that have been agreed between the United States and Mexico (primarily the *1906 Border Convention* and *Treaty for the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande of 3 February 1944,* commonly known as the *1944 Water Treaty*) (IBWC 2007). Those rights and obligations include: distribution between the two

7. The externality problem has eclipsed the allocation problem in some cases, leading to a completely different strategic game being played between countries sharing a water catchment area. Downstream countries can use their political power to thwart developments in upstream countries that may have an impact on the quality and quantity of water they receive. This is particularly the case, for example, for international water courses in the Middle East (Yetim 2002).

8. Different principles can be used as a basis for determining international water rights: absolute territorial sovereignty in which that each state has absolute sovereignty over the water located in its territory; absolute territorial integrity in which an upper watercourse State is under an obligation to not cause a change in the natural integrity of the resource without the consent of downstream users; and optimal and equitable utilisation in which each watercourse state has a right to use the waters of international watercourses without causing significant harm to other watercourse state. This latter principle is most widely advocated within the international community and is reflected in the UN Convention.

countries of the waters of the Rio Grande and the Colorado River; regulation and conservation of the waters of the Rio Grande by joint construction, operation and maintenance of international storage dams and reservoirs and plants for generating hydroelectricity; regulation of the Colorado River waters allocated to Mexico; construction of flood mitigation and prevention measures; solution of border sanitation and water quality problems; and demarcation of the international boundary. The Commission also settles disputes that may arise in the application of the treaties. The allocations of water between the United States and Mexico were fixed in the *1944 Treaty* and have not been altered since (see Box 1). The base of the allocations is obscure and difficult to determine in the mists of time. The institutional structure governing the basin (including resource allocation policy) has been criticised for its lack of responsiveness to changing conditions and the inadequate attention paid to sustainability, equity and participation concerns (Schmandt 2002).

Box 1. Water Allocations between the United States and Mexico

The waters of the Colorado River and Rio Grande river systems are allocated between the United States and Mexico according agreements under a number of treaties. Mexico receives:

- 60 000 acre feet annually of the waters of the Rio Grande;
- all the waters reaching the main channel of the Rio Grande from the San Juan and Alamo rivers;
- two-thirds of the flow in the main channel of the Rio Grande from the measured Conchos, San Diego, San Rodrigo, Escondido abd Salado Rivers, and the Las Vacas Arroyo, subject to certain provisions;
- One-half of all other flows occurring in the main channel of the Rio Grande downstream from Fort Quitman;
- A quaranteed annual quantity of 1.5 million acre feet of water from the Colorado River, delivered in accordance with schedules formulated in advance by Mexico within specified limitations;
- any other waters arriving at Mexican points of diversion under certain understandings.

The United States receives:

- all of the waters reaching the main channel of the Rio Grande from the Pecos and Devils Rivers, Goodenough Springs and Alamito, Terlingua, San Felipe and Pinto Creeks;
- one third of the flow reaching the main channel of the Rio Grande from the six named measured tributaries from Mexico and provides that this third shall not be less, as an average amount in cycles of five consecutive years, than 350 000 acre feet annually; and
- One-half of all other flows occurring in the main channel of the Rio Grande downstream from Fort Quitman.

Source: IBWD 2007.

28. Other treaties and agreements are designed for the joint management of internationally shared waters (*e.g.* Colorado and Rio Grande, Mekong, Senegal, Niger). These joint management organisations are largely confined to ensuring water quality and to developing and maintaining infrastructure (such as dams, flood mitigation measures, sewage treatment plants, etc) and do not generally engage in allocation of waters. For example, the International Joint Commission administers Great Lakes under the *Boundary Waters Treaty of 1909* between the United States and Canada. The role of the International Joint Commission is to: prevent and resolve disputes between the two countries; approve projects that affecting boundary or transboundary waters; assist in the protection of the transboundary environment (both air and water; and to alert governments to emerging issues along the boundary that may give rise to bilateral disputes (IJC 2006). Another example is the European Union's Water Framework Directive which sets goals for the condition of Europe's water and introduces new institutional structures to manage water at the level of the river basin district rather than at the level of individual Member States. The focus of the Water Framework Directive is primarily on improving water quality, rather than allocation of water resources, although it does move towards the use of cost recovery and water pricing to provide adequate incentives for efficient use of water (Kallis and Butler 2001).

National level

29. There is a great deal more experience of dealing with the allocation problem in the water sector at the national level. As in the case of international water resources, the distribution of water amongst users and user groups in each country is often embedded in existing social, political and industrial structures. The emphasis in the initial allocation of water rights has generally been on the existing historical patterns of usage and riparian rights of users, reflecting a need to ensure a perception of equity in distribution among user groups. However, many governments are placing an increasingly greater premium on making the most efficient of scarce water resources. This requires that institutional structures be found that create incentives for users to allocate water resources to where they have the highest value to society. Market mechanisms such as the establishment of water markets that allow trading in entitlements can have advantages over traditional regulatory approaches in improving the economic efficiency of water use (Productivity Commission 2006; Weber 2001).

30. The development of market-based instruments to complement or replace existing regulatory and planning based management systems are making a significant contribution to achieving this in a number of countries. Water markets are well-established in Australia, South Africa, the western states of the United States and Chile and are under consideration or being trialled in other countries. Market mechanisms are broadly defined as instruments that encourage behaviour through market signals rather than through explicit directives. Compared with traditional regulatory approaches, where suitable, they offer greater flexibility to participants, and have the potential to lower compliance costs and provide dynamic incentives to reduce future costs. The use of market mechanisms also helps to improve the transparency of the tradeoffs being made between various uses, and sharpens the incentives for efficient use.

31. Australia is arguably the most advanced in terms of developing sophisticated water markets to improve water management, having first established a permanent water trading scheme in 1983 in South Australia. During the 1990s, national and state government attention increasingly focused on the problems of water resource degradation, security of supply for irrigators and population centres, costs of enhancing or refurbishing water supply infrastructure, and environmental flows (Quinlivan 2006). Australia has done a lot of thinking about how to achieve improved conservation and use of its scarce water resources. The National Water Initiative, which was agreed amongst the Commonwealth and state and territory governments in 2004, provides a blueprint for a cooperative national approach to water management and builds on the previous water reform initiatives that have been undertaken in the various jurisdictions (Thompson 2006). The objective of the National Water Initiative is "a nationally-compatible, market, regulatory and planning based system of managing surface and groundwater resources for rural and urban use that optimises economic, social and environmental outcomes" (COAG 2004).

32. The key features of the Australian experience can be summarised as follows:

- Markets for trading water entitlements (a prescribed, defined right to an amount of water, sometimes known as permanent water) and seasonal allocations (a volume of water that an irrigator is allowed to access in a particular season, or temporary water) are well-established within major irrigation areas and expanding into other areas, including a pilot scheme to allow trading between States.

- Statutory provision for environmental and other public benefit outcomes, including the use of markets to help allocate water use towards environmental outcomes through the purchase of entitlements and seasonal allocations to address over-allocation of water resources.

- Attempts to improve the clarity around the assignment of risk arising from future changes in the availability of water for the consumer groups (irrigators, towns, etc)

- Unbundling of the water entitlements, particularly the separation of water rights from land title, in order to remove barriers to the more efficient use of water, increase transparency, reduce transactions costs, and allow the development of more sophisticated trading mechanisms (such as option rights).

- Shift towards a holistic "whole of river" approach to matters such as water allocation, operational management, and monitoring of trends in river health, as well as to ensuring that institutions are coordinated, accountable and responsive.

33. The western states of the United States have also had a long history of using water markets ti improve the allocative efficiency of water use (National Research Council 1992). When water trades in the western United States, either a water right is sold or use of the right is leased for a period of time. Ownership of a water right conveys access to a specified quantity of water in perpetuity, subject to conditions such as priority, timing and location. The doctrine of prior appropriation underlies most water laws across the western United States (Brown 2006). Under the prior appropriation doctrine, water rights are based on "first in time, first in right".[9] This provides for clearly defined and transferable water rights in which the concept of "priority date" is significant, although the states differ in how they implement the doctrine and administer the water rights systems.

34. One outcome of prior appropriation is a lack of homogeneity in the rights assigned to water users. In order to deal with the stochastic nature of water flows and, priorities are assigned to water rights from junior rights up to senior rights, with water deliveries to holders of senior rights having priority. In some cases, such as mutual ditch companies and water conservancy districts, a different approach based on proportional rights is used within the prior appropriation doctrine (Brown 2006). With such rights, all users have equal priority to a water entitlement according to their quota of the total water availability which will vary from year to year. Organisations based on proportional rights manage nearly half the water in the western United States.

35. Several features of the Australian and western United States experience are potentially relevant to the fisheries sector. First, a two-tier approach to the allocation of rights in some jurisdictions in Australia and the United States provides a mechanism for combining certainty with an element of flexibility. For example, in New South Wales in the southern Murray-Darling Basin, irrigators hold entitlements that define access rights to a specific quantity of water each irrigation season (Peterson *et al.* 2004). The supply reliability of these entitlements varies and depends on storage capacity and the volume of entitlements distributed. In New South Wales, entitlements are for 15 years and are either "high security", which are likely to be met between 96 and 99 years in 100, or "general security", which are likely to be met around 75 years in 100 and only after high security entitlements have been met. Within an irrigation season, each entitlement holder can (for a charge from utilities that operate the supply infrastructure) access a percentage of their entitlement (called a seasonal allocation). Irrigation utilities determine the seasonal allocations according to the availability of water supplies from storages and entitlement holders can call on all or part of their allocations at any time during an irrigation season. In each year, therefore, the total volume of water available is shared among water entitlement holders according to their priority and entitlement to the resource.

36. Second, the efficiency of water use is clearly enhanced by the trading of water rights. Trades can occur on both a permanent and temporary (or lease) basis. In the western United States, considerably more rights are leased on a short term basis than are sold permanently. Between 1990 and 2003, around 27.8 million ML of water was traded on a lease basis while 1.4 million ML was sold (Brown 2006). This is largely because of the lower transactions costs generally involved in leasing and the fewer legal and

9. In the eastern United States, in contrast, water rights are based on riparian rights, derived form English common law.

administrative constraints that apply relative to permanent sale. There are remaining concerns, however, about the competitiveness of some of the water markets, the availability of information for participants, and administrative and legal constraints inhibiting trade. Nevertheless, the potential economic gains can be substantial. The Australian Bureau of Agricultural and Resource Economics has estimated that the more widespread use of water trading in the Murray-Darling Basin would increase output by around AUD 48 million annually.

37. In Australia, irrigators trade primarily with other irrigators in their irrigation district and the trade is predominantly in seasonal water allocations. Markets for trade are well-established with electronic exchanges and brokers facilitating trade. In 2000-01 to 2002-03, aggregate trade in seasonal allocations in the three major irrigation districts represented, on average across the three districts, 11-20% of allocations (Peterson *et al.* 2004, p. 8).[10] In contrast, trade in permanent entitlements represented around 1-2% of annual total allocations, averaged across the three districts. A recent inquiry by the Productivity Commission into rural water use found that water trade has facilitated the continual movement of water to its highest valued uses, but that a number of regulatory and administrative constraints on water trade remain that impede efficiency (Productivity Commission 2006, p. 67). These constraints include inadequate market information, restrictions on who can participate in water markets, restrictions on trade out of irrigation districts, and the speed and transparency of approvals for water trades.

38. Third, the separation of water entitlement from land title has, in the case of Australia, lowered the transactions costs of trading water, increased transparency, and improved the flexibility of entitlement in managing their business operations (Pigram and Musgrave 2006). Further unbundling of water entitlements to allow for separate rights for each of the components of the water entitlement (*e.g.* water allocations, delivery capacity rights, site-use licences) is being pursued where feasible (Quinlivan 2006; Thompson 2006; Productivity Commission 2006).

39. Finally, the issue of new entrants within each user group (i.e. irrigators, towns, etc) is dealt with almost entirely through the market in both Australia and the United States, with new entrants being required to acquire water entitlements through purchase from existing holders. However, the case of shifting allocations between user groups or of allowing new user groups to access a water system is less straightforward. In particular, the increasingly politically sensitive issue of ensuring environmental flows is somewhat (but not perfectly) analogous to the new entrant problem in international fisheries.[11] Providing environmental flows to a river or lake system in times of water shortage requires that the allocations of other users be reduced, at least temporarily. Environmental flows can be met either through direct command and control mechanisms, investing in infrastructure to gain additional environmental flows, or purchasing entitlements through the market. In the western United States, 113 out of a total 718 lease transactions between 1990 and 2003 were for environmental purposes, representing a total volume of 4.8 million ML (or 17% of the total volume of water leased) (Brown 2006, p. 5). A further 0.2 million ML were sold on a permanent basis, representing 16% of the total volume of water entitlements sold over the period. In Australia, the Productivity Commission recommended that environmental managers and service providers be encouraged to participate in water markets, markets for river be capacity be developed, and that environmental managers be allowed to develop portfolios of water and related products (such as entitlements and seasonal allocations, leases, option contracts, river capacity shares).

10. The three districts are the Murrumbidgee Irrigation Area, the Murray Irrigation district and the Goulburn-Murray Water district.

11. An environmental flow is defined as a water regime provided within a river, wetland or estuary to improve or maintain ecosystems and their benefits where there are competing water uses and where flows are regulated (Productivity Commission 2006, p. xviii).

3.2 Carbon allocation and trading

40. The challenge of developing international agreement for limiting greenhouse gas emissions has many parallels with policy challenges inherent in managing international fisheries. Both require international collective action in order to address an international common property resource dilemma. Both are therefore multilateral environmental problems, involving large numbers of players, each of whom has different objectives, development strategies and resource endowments. As in the case of international fisheries, any international agreement to limit greenhouse gas emissions must be self-enforcing in the face of a lack of a supra-national body to coerce countries to provide an efficient level of environmental protection. Coupled to this, there are uncertainties over the size and timing of the costs and benefits of abatement and the strong incentive for free-riding. The key difference lies in the dimension of the problem as there are no truly global fish stocks; even highly migratory fish stocks are confined to a corner of the world's oceans. Greenhouse gases, in contrast, are a uniformly mixed air pollutant and will affect the global atmosphere irrespective of the location of the emissions.

41. Policies to reduce emissions of the main greenhouse gas, carbon dioxide (CO_2), have been debated at length in many national and international forums over the past couple of decades. There has emerged a strong recognition that market-based mechanisms are likely to provide more efficient means for achieving reductions in CO_2 at least-cost than command and control regulation (see, for example, Ekins and Barker 2001; Stern 2007). Much of the debate in the theoretical literature, in applied analysis and in international negotiations (such as Kyoto) has focused on the use of carbon taxes and carbon emissions trading programs. The concept and practice of carbon trading schemes has particular relevance to international fisheries in that a cap on emissions (or, in fisheries, catches) is put in place, and rights to emit (or catch fish) are allocated by some means amongst parties to any agreement. However, as was seen in section 2 above, there is very little trading undertaken in fishing entitlements at the international level. The parallels are stronger at the domestic level where fisheries based on individual transferable quotas are essentially cap and trade systems, as in the case of carbon trading.

42. There is a huge literature on the theory and practice of carbon trading schemes and it is well beyond the scope of this paper to provide a thorough survey. Rather, attention will be focused on drawing some insights from the literature and experiences at the international and national/regional levels that may be relevant to the quota allocation issue in international fisheries.

International level

43. At the global level, the Kyoto Protocol provides the international framework for a world greenhouse gas trading scheme, although the scheme has not been fully implemented as yet (the treaty itself came into force in 2005). In broad terms, the treaty allows nations that emit less than their quota of greenhouse gases to be able to sell emission credits to other nations who require additional quota. This applies only to Annex 1 countries (composed primarily of developed countries) that have ratified the Kyoto Protocol.

44. The initial allocation of greenhouse gas emission targets was done on the basis of mandatory targets ranging from -8% to +10% of the countries' individual 1990 emissions levels (UN Framework Convention on Climate Change n.d.). The objective is to reduce overall emissions of such gases by at least 5% below existing 1990 levels in the commitment period 2008-2012, with the target reductions varying from nation to nation. Under the Protocol's system for the accounting of targets, the amount to which an Annex 1 Party (with a commitment inscribed in Annex B of the Kyoto Protocol) must reduce its emissions over the five year commitment period (known as its "assigned amount") is divided into units each equal to one tonne of carbon dioxide equivalent. These assigned amount units provide the basis for emissions trading. Trade in the assigned amount units are supplemented by trade in other carbon credits generated

under the additional flexibility mechanisms developed under the Kyoto Protocol: Emission Reduction Units from Joint Implementation projects, Certified Emission Reductions from Clean Development Mechanisms, Removal Units from Sinks projects in Annex 1 countries.[12]

45. The Kyoto Protocol represents the outcome of long negotiations over, amongst other things, the respective roles of developed and developing countries in addressing climate change. Balancing the interests of these two broad groups in achieving an agreement has required careful balancing of targets, commitments and institutional mechanisms. The use of flexible instruments such as Joint Implementation and the Clean Development Mechanism helped to provide an incentive for countries to participate in the agreement. Indeed, some mechanisms of the Protocol had sufficient support that they were set up even before the Protocol entered into force. This was the case, for example, with the Clean Development Mechanism through which developed countries can partly meet their binding emissions targets through credits earned by sponsoring greenhouse gas reducing projects in developing countries. The effect of such flexible instruments is that they better align incentives towards the desired objectives through the effective and innovative use of side payment-type mechanisms.

46. Incentives to maintain the agreement are aided by the Kyoto Protocol compliance mechanism which is designed to strengthen the Protocol's environmental integrity, support the carbon market's credibility, and ensure transparency of accounting by Parties to the Protocol. A dual approach is taken to ensuring compliance. On one hand, advice and assistance is provided to parties in order to promote compliance and provide an early warning system for potential non-compliance with emissions targets and methodological and reporting commitments (particularly the carbon accounting system that has been agreed by Parties). At the same time, non-compliance where it has been determined that a Party's emissions have exceeded its assigned amount attracts penalties in the form of a declaration that the party is in non-compliance and the Party having to make up the difference between its emissions and its assigned amount, plus an additional deduction of 30%. The Party must also submit a compliance action plan and is not eligible to participate in emissions trading until it is reinstated.

47. In summary, while the Kyoto Protocol is in its relatively early stages and many of the mechanisms (especially trading and compliance) are yet to be fully implemented and tested, the fact that agreement was reached on a number of key issues provides a few insights for the fisheries sector. In particular, allocation of emission allowances and setting of targets meets only part of the challenge. The focus on using flexible mechanisms to meet the targets in a cost-effective way, through trading, joint implementation, etc, helped to encourage Parties to come to agreement and improve the range incentives to join the agreement. The use of more flexible mechanisms in international fisheries agreements may hold similar attractions in trying to find innovative ways to expand the cooperative surplus and allow for side payments to be made in one way or another. A prime example would be the use of trading mechanisms in fishing rights allocations between nations that are party to an international fisheries agreement. At the same time, strong compliance measures linked to sanctions on access rights and backed up by a credible transparent reporting system are required. Such sanctions would have even greater effect if the rights themselves had a market value attached, as would be the case if they were traded.

National/regional level

48. An increasing number of national and regional carbon trading schemes have been implemented or are planned. Active carbon trading schemes are in place in Australia New South Wales Greenhouse Gas Abatement Scheme), the United States (Regional Greenhouse Gas Initiative), the United Kingdom (UK Emissions Trading Scheme), and the European Union, with the latter's Emissions Trading Scheme being

12. The value of the project-based transactions in 2005 was USD 2.8 billion, with 95% being generated through the Clean Development Mechanism (Capoor and Ambrosi 2006).

by far the largest and most ambitious scheme (see Box 2). Many other countries are in the process of considering, planning or implementing carbon trading schemes, including New Zealand, Canada, Japan, China, Korea and Norway. Companies such as BP and Shell have undertaken voluntary emission reduction through the use of internal trading schemes. The US Chicago Climate Exchange runs a voluntary cap-and-trade for all six greenhouse gases.

Box 2. The European Union Emissions Trading Scheme

The European Union Emissions Trading Scheme (ETS) is a mandatory and binding cap-and-trade system that began in January 2005 and includes the 27 countries of the EU. The program is run in two phases: Phase 1 is a trial period and runs from 2005-2007; Phase 2 coincides with the Kyoto commitment period and runs from 2008-2012. The cap covers CO_2 although other greenhouse gases may be added in the future. The ETS regulates downstream about 12 000 emissions sources, accounting for half of all EU emissions. The scheme covers the following "trading sectors": iron and steel; cement, glass and ceramics; pulp and paper; electric power generation; and refineries. Because half the EU's emissions remain outside the trading program, the EU's Kyoto cap must be met by a combination of efforts by sources in the trading sector and by controls on sources in the non-trading sectors.

The ETS has a decentralised structure and each country submitted plans for the allocation of allowances for Phase 1 and Phase 2 for approval by the European Commission. Within the EU-wide Kyoto target, each member State has its own national emissions target as determined under the EU burden-sharing agreement that defines each Member State's emissions reduction obligation. Each country is required to develop a National Allocation Plan which, among other things, addresses national emissions in two steps. First, it allocates the country's total emissions targets between the trading and non-trading sectors. Second, it specifies how the permits will be district=buted among individual companies.

Allowances are to be distributed free of charge although, Under Phase 1, countries were allowed to auction an upper limit of 5% of their allowances. The upper limit for auctioning will be raised to 10% in Phase 2. Emissions sources covered by the ETS may satisfy their commitments by surrendering allowances in an amount equal to their emissions or may supplement ETS allowances with credits available under Kyoto protocol rules, including Joint Implementation and Clean Development Mechanism credits.

Allowances under the ETS are fully tradable. In 2005, USD 8.2 billion of trades took place, accounting for a volume of 324.3 $MtCO_2$. By the end of the first three quarters of 2006, trading had increased to value of trade in allowances had increased to USD 18.8 billion (volume of 763.9 $MtCO_2$) (Capoor and Ambrosi 2006). In contrast, the value of the New South Wales Greenhouse Gas Abatement Scheme grew from USD 59 million in 2005 to USD 184 million in the first three quarters of 2006.

49. Each of the current and proposed schemes differs in a wide range of operational details, but the broad thrust and conceptual mechanics are the essentially the same. The predominant method for allocation of allowances used in schemes currently in place is one of free allocation based on historic emissions (known as "grandfathering"). Auctions are able to be used for part of the allocation process in some schemes. For example, countries have this option under the European Union Emissions Trading Scheme (EU ETS), although only Denmark and the United Kingdom have taken it up. It is also feasible that some allowances could be allocated directly to groups that are disproportionately affected by the costs of a cap-and-trade system (Kruger 2005).

50. The issue of new entrants to the carbon market is problematic. For example, should a company wishing to develop a project that emits greenhouse gases (such as a new power station) be required to purchase carbon allowances in the market? Or should it have a free allocation of carbon allowances, as other established companies had received? It can be argued that the denial of free allowances to new sources discriminates against the new sources, even if they may be less-greenhouse gas intensive than existing sources. Ahman *et al.* (2005) argue that, under perfectly competitive conditions, investment decisions should not be affected by whether free allocation is given to new entrants or not. However, such conditions do not always prevail and distortions may arise.

51. Within the EU ETS, all 25 member States have set up provision for a guaranteed volume of allowances to be available to new entrants free of charge. This has been done by creating a set-aside of allowances specifically for new entrants and allowances from these reserves are usually provided on a first-come, first-served basis.[13] Some EU member States (e.g. Poland and Italy) plan to purchase allowances from the market for new entrants if their new entrant reserves are oversubscribed. There is, however, scope for companies in some countries to generate carbon credits through national level schemes similar to Joint Implementation and the Clean Development Mechanism under the Kyoto Protocol. The EU is currently considering how to ensure that such mechanisms available within its scheme can be efficiently linked to its Kyoto obligations.[14] It has also been suggested that new entrant allocations be tied to the achievement of certain performance standards (Kop 2007, p.6). For example, new power stations might be required to meet particular emission levels or empl0y particular technologies in order to qualify for a new entrant reserve.

52. The remaining issues of particular interest to the development of allocation rules for international fishing agreement – compliance and balancing the interests of various groups – are of less relevance to national and regional carbon schemes. Compliance is ensured through the domestic legislative and enforcement systems of countries. In terms of dealing with the interests of competing groups, the carbon schemes clearly apply to the larger emitters within a country. In the case of the EU, this was restricted to just six broad sectors covering about half of the total greenhouse gas emissions of the EU. The remaining emissions will be dealt with through more standard regulatory means. The key to ensuring support from the more concentrated and political group of large emitters is to ensure that there is a range of flexible mechanisms for ensuring efficiency and that the market information is clear and transparent.

53. In summary, national and regional efforts to cap greenhouse gas emissions have focused on creating flexible mechanisms to enable emission targets to be met at least cost. The allocation of emission allowances, while important in altering the pattern of wealth distribution, is only one part of the policy package. Allocation goes hand in hand with the use of emissions trading schemes in order to shift the incentives of firms in meeting targets, and equating the marginal cost of abatement across the (regulated) economy. Capping emissions without allowing trade in emissions would represent no gain in efficiency over command-and-control regulation.

3.3 Summary

54. Table 2 provides an overview of the key findings from the review of experiences in the other sectors in sections 3.1 and 3.2.

13. The most common allocation method for a new entrant is to base allocation on general emission rates for a sector or product type, and forecasted activity of the new entrant.

14. In contrast, the United States SO_2 program has a very limited new-entrant set-aside and allows retiring entities to retain their allowances.

Table 2. Summary of Allocation Principles in Other Sectors

Issue	International water resources	National water resources	Greenhouse gases (Global)[a]	Greenhouse gases (National/regional)
Basis for allocation	Negotiated bilateral or multilateral agreements, generally based on historical and geographical criteria	Generally historical riparian rights initially, then traded amongst participants within the water system	1990 emission levels in Annex 1 countries	1990 emission levels, some auctioning of allowances
Balancing interests of various groups	Political negotiation, equity concerns primary factor	Initial allocation tends to be based on historical rights, rights traded thereafter. Emphasis on efficiency of water use	Currently subject to global debate, particularly between developed and developing countries	Initial allocation on historical emissions, trade thereafter
Dealing with new entrants or expansion	Not necessary as fixed number of countries in a water system	Generally through buying water rights in the market, otherwise administrative allocation (e.g. for environmental flows)	Generally through purchase of allowances or allocation of credits under Clean Development Mechanism, Joint Implementation.	Allocations for new entrants set aside under EU ETS. Some Stets to buy allowances for new entrants. Also possibility to purchase allowances in market.
Using allocation mechanisms to improve compliance		Rights generally conditional on maintaining good compliance record. Compliance eased as enforcement is undertaken through legal system.	Problem of designing a self-enforcing agreement as there is no international enforcement agency. Kyoto compliance mechanism of transfer of 1.3 times the shortfall plus suspension from trading	Primarily financial penalties. Compliance eased as enforcement is undertaken through legal system.
Tradability	Undertaken in limited cases, no pricing involved	Generally fully tradable within the water system	Fully tradable	Fully tradable
Examples	Major river basins; Colorado/Rio Grande, Great Lakes,	Australia, western United States	Kyoto Protocol	Australia, United States, EU, United Kingdom

a. As no international systems are in place for carbon allocation and trading, the summary here is based on recent analysis of the design and implementation of potential global carbon allocation and trading schemes. *Source*: OECD

4. Insights for International Fisheries

55. It is clear that the international and national experiences in designing institutional mechanisms to efficiently and equitably allocate water resources and cut greenhouse gas emissions have parallels with many of the policy challenges facing allocation of rights in international fisheries. These experiences can inform the design and implementation of international fisheries arrangements; not only in the way in which rights are allocated, but also in the way those rights are then able to be used within the arrangement to improve the prospects for a stable cooperative outcome.

56. The fundamental lesson from the experiences in the water and greenhouse gas policy areas is that a cooperative agreement is more likely to be stable and successful if it contains flexible mechanisms that help to better align incentives of participants with the desired outcomes. Expanding the scope of the negotiations to encompass a wider range of possible institutional arrangements can enlarge the potential for agreement to be reached. Importantly, these other policy areas rely heavily on a combination of regulatory approaches and market mechanisms, in particular cap-and-trade systems, to ensure that objectives are met. In contrast, market mechanisms have not been a feature of negotiations on international fisheries to date. Rather, decisions on the initial allocation of participatory rights have been the focus of negotiations, neglecting the need to design flexible institutional mechanisms that allow the optimum use to be made of the resource once it is allocated amongst participants.

Historical basis for allocation

57. It is clear that it is politically difficult to move beyond the use of historical criteria as a basis for determining the initial allocation of resources or emissions. Concerns over equity and sovereignty dominate countries' starting positions in negotiations, and, in general, countries tend to equate equity with the maintenance of current use or emission patterns. This tendency is reinforced by a perceived need to maintain sovereignty, in a broad sense, over historical usage patterns (and informal access rights) in international areas. This is reflected in the fact that international negotiations on water use, greenhouse gases or fish resources actually take place at two levels: between countries at the multilateral level; and between users within the individual countries. These two levels of negotiations are inextricably linked and will drive the equity and sovereignty criteria to the front of the negotiations. As a result, riparian rights or prior appropriation in the case of water, or historical greenhouse gas emission levels, or catch history in fisheries, tend to carry more weight when considering other possible allocation options. Alternative allocations based on output or population have not realistically been considered in the context of water, greenhouse gases or fisheries.[15]

Rights tend to be distributed free of charge

58. In the three sectors discussed in this paper, participatory rights that are allocated are generally given away free of charge. While the selling or auctioning of rights is generally favoured by economists, such options have not been strongly considered in the negotiation of international fisheries agreements. Rights are an asset which alters the distribution of wealth, and participants in an international negotiation on fisheries are unlikely to find it optimal to come to a cooperative agreement on buying rights in a fishery that they have been using free of charge beforehand. [16] In this case, the gains from the non-cooperative

15. The concept of water as a human right has been enshrined in the Millenium Development Goals, which may shift the focus to other criteria such as the needs of disadvantaged communities.

16. In principle, the initial distribution of rights does not matter in terms of economic efficiency provided the rights, once allocated, can then be traded so that they reach their highest value uses.

outcome are highly likely to outweigh the gains from the cooperative outcome, making an agreement difficult to obtain or maintain. Providing fishing rights free of charge may be the price of obtaining buy-in to a cooperative international agreement.

Economic efficiency is important

59. As mentioned above, the strong focus on the equity of initial allocations in international fisheries arrangements has been at the expense of considerations of how to improve the efficiency of resource use once the initial allocation is complete. This is in contrast to the cases of water use and greenhouse gas abatement where economic efficiency is a major objective in the design of institutional mechanisms to manage the resource or emissions following the initial allocations. Improving economic efficiency in international fisheries through the optimal management of resources will help to improve the resource rent generated by the fishery. As a result, parties to the negotiations on setting up an RFMO have the prospect of a creating a larger cooperative surplus that can, as demonstrated by Munro (2006), improve the prospects of a stable cooperative outcome. In other words, improving the economic efficiency of the fishery will improve the size of the potential resource rents that can be divided amongst participants: it is necessary to try and maximise the size of the pie in addition to sharing the pie between recipients.

Tradability of rights can improve economic efficiency and the prospects for cooperation

60. In each of the sectors considered, an essential feature of improving economic efficiency is the ability to trade or transfer rights between participants through cap-and-trade systems. In principle, this will assist in shifting resources to their highest value uses, thereby increasing resource rents. This has certainly been the case for water use and greenhouse gas abatement where the ability to trade entitlements and allowances has been a central factor in the success of the schemes to date. It has also been demonstrated in the case of domestic fisheries where tradable rights have been introduced.

61. Currently, international fisheries have implemented just the “cap” part of cap-and-trade systems. This may address the sustainability issue, but leaves out any consideration of maximising the resource rent from a fishery and reduces the flexibility of users to maximise resource rent. The trading of quota rights in international fisheries is gaining more attention in policy discussions and is actually being undertaken on a very minor scale in some RFMOs. The option of trading rights was briefly canvassed in both the MRAG (2006) report for the WCPFC and the guidelines for a model RFMO (Lodge *et al*, 2007).

62. The ability to trade rights in an agreement is likely to improve the prospects for a stable cooperative agreement. Once participants have begun trading and transparent prices for the quota asset are well known, the costs of breaking any agreement will be more transparent. Countries potentially will have more to lose from breaking the agreement. The asset price of quota is likely to be higher under trading, further increasing the cost of defecting from the agreement. As has the case in the other sectors, and in domestic implementation of rights based fisheries management systems, there are many ways to design institutional mechanisms to address particular objectives and concerns in a tradable rights system. Further work is required to analyse the characteristics of particular international fisheries and countries’ objectives to design such mechanisms.

Innovative rights structures can improve flexibility and efficiency

63. Fishing rights in RFMOs are generally regarded as a unique and singular entitlement. However, as was seen in the case of water entitlements in the western United States and Australia, it is feasible to have different classes of rights for the resource, depending on the riskiness and duration of the right (e.g. permanent and seasonal entitlements, senior and junior rights, high security and low security entitlements).

64. Such a two-tier approach to entitlements has potential application to the allocation of rights in international fisheries. In broad terms, an example of such an approach might involve a certain proportion of the total quota rights being allocated as base quota to the founding members of an RFMO on a permanent basis. The remaining quota could be classified as flexible quota and could be distributed on an annual basis to either RFMO members or non-members through a mechanism such as an auction. The proceeds of the auction could then be used to run the secretariat for the RFMO, undertake monitoring and surveillance, or be distributed as a "dividend" to RFMO members. Such an approach could improve the economic efficiency of RFMO operations, increasing the possible cooperative surplus and the incentive for cooperation, as well as provide a mechanism for new entrants to enter the fishery. It is, in effect, a mechanism to provide a type of side payment to improve the prospects for cooperation.

65. A two-tier approach to quota rights reflects ideas that have been advocated by some commentators for domestic fisheries as a means of improving the flexibility and resilience of individual fisheries in the face of uncertainty over stock dynamics, changes in economic conditions, and cope with natural fluctuations. For example, Pontecorvo and Schrank (2001) advocated the development of a core fishery concept in fisheries management encompassing a dual layer of rights. In this approach, a small core fishery would be maintained to catch the quantity of fish that could be safely taken over the long term as a stock approaches the lower limits of its natural cycle: when fish are abundant, the excess would be auctioned off to fishers who may or may not necessarily have long term rights in the fishery.

66. Different rights structures could also be used to partially address concerns over equity, concentration and the aspirations of developing states that are party to an agreement. For example, following the two-tier approach discussed above, the proportion of rights that are classed as base quota might be restricted from trading, while flexible quota could be fully tradable. There are, of course, a myriad number of ways to organise rights and trading mechanisms to meet equity concerns.

67. Unbundling of fishing rights, as has been done in the water sector in Australia, may also be beneficial in improving the flexibility that rights owners have in international fisheries. In principle, a fishing right actually contains two separate features: a right to ownership, which is long term and is a right to receive allocations in the future; and a right to exploit the allocations. Ownership and exploitation rights are generally bundled together, which may reduce the incentive to transfer rights temporarily and increasing the costs. Separating, or unbundling, the right to ownership and the right to exploit may improve the flexibility of any trading system, while maintaining sovereignty over resource shares. This could help to improve flexibility, economic efficiency and the generation of resource rent in an international fishery. Such a dual property rights structure has been used successfully in some domestic fisheries. For example, New South Wales in Australia established a fishery share system in 1994 in which there was a clear distinction between shares (the long term interest) and specific quota allocations Both could be traded freely, but separate registers are maintained for both types of transactions (Young 1999).

Dealing with new entrants remains difficult, but not impossible

68. The issue of dealing with new entrants remains somewhat problematic. It would be eased to some extent if new entrants were able to purchase quota to enter the fishery. The use of new entrant set-asides (as used in the EU ETS) is also an option, especially if the set-aside quota can be leased on a short term basis by existing participants. The set-aside quota could then be perceived as being "put to productive use" rather than being seen as a non-working asset. However, Munro (2006) argued that a set-aside may reduce the incentive for countries to join a cooperative agreement as there may be benefits to free-riding on the conservation efforts of Parties to an agreement before taking advantage of the new entrant set-aside at a later date. Further work is necessary to see if sharing mechanisms can be built on the lessons from the other sectors.

Strengthen rights, transparency and compliance

69. Strengthening the rights in international fisheries would help improve the efficiency of the fishery as well as the prospects for a stable agreement. Improving transparency and the enforcement of RFMO regulations are also necessary steps. However, as is well known, achieving these aims in international fisheries is fraught with difficulty. The compliance mechanism built into the Kyoto Protocol provides some guidance for the fisheries case. The monitoring and reporting of compliance needs to be supported by a credible, transparent mutually agreed accounting system. In the case of greenhouse gases, considerable effort went into developing monitoring and reporting mechanisms, with strong penalties for inadequate reporting agreed within the Kyoto Protocol. Similar reporting requirements are necessary in international fisheries. One of the main functions of RFMOs is as a statistical clearing house for the stocks under their control and there is a need to ensure the robustness of such functions. The use of strong financial sanctions to enforce regulations is also necessary. The Kyoto Protocol levies a penalty of 30% on the errant country, which is a relatively sizable penalty. An additional benefit of introducing tradability into RFMOs would be the ability to suspend violators from partaking in quota trading.

5. Next Steps

70. This paper has been developed as part of the work on "International governance reform" under the Committee's project "Reforming Fisheries Policies". Delegates will recall that the other components of the project are: capacity adjustment [AGR/FI(2006)18/REV2]; labour market adjustment (the workshop on the human side of fisheries adjustment held in October 2006); and domestic governance reform [TAD/FI(2007)13]. A synthesis report will bring together the key findings from the four components at the end of the project.

71. The work on international governance reform will comprise the current paper plus a complementary paper presenting case studies of reform in international fisheries that will be presented to the 101st Session of the Committee in April 2008. The findings from the two papers will then be drawn together in a synthesis report on governance reform in international fisheries which will be presented to the 102nd Session of the Committee in October 2008.

72. Delegates are requested to discuss and provide comments on the current paper. A revised paper will be presented to the 101st Session of the Committee in April 2008, together with a paper on case studies of reform in international fisheries.

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TRADE AND AGRICULTURE DIRECTORATE
FISHERIES COMMITTEE

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GLOBALISATION AND THE FISHING INDUSTRY

This document is distributed for DISCUSSION and GUIDANCE to the 100th Session of the Committee for Fisheries, 29-31 October 2007, under item 9. 1).

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GLOBALISATION AND THE FISHING INDUSTRY

EXECUTIVE SUMMARY

Over the past decades, global markets for fish and fish products have changed considerably and continue to do so. Participants along the fisheries value chain (fleets, aquaculture farmers, processors and retailers) are searching for new opportunities, reduced production costs and profitable investments in an increasingly globalised business environment. This process presents a number of policy challenges to governments. The key to meeting these challenges lies in developing and implementing management frameworks that can accommodate the pressures stemming from the process of globalisation without compromising the sustainability of the resource.

The value chain provides an organizing framework that will help understand the linkages between its constituent elements (harvesting; aquaculture; processing; and retail). Globalisation manifests itself in a number of ways in each element of the fisheries value chain:

In **harvesting**, globalisation is driven by the need to secure access to fish and to ensure a return on capital investments in vessels. In cases where domestic fisheries management frameworks have limited access to domestic resources, access to foreign resources can manifest itself in various ways, including access agreements, joint ventures, setting up foreign operating companies etc. The decision to expand outside national EEZs may also lead to fishing on the high seas. The conditions under which domestic fisheries operations take place will be the basis for vessel owners' decisions to 'go global'. The principal concern for harvesting operators when seeking opportunities to globalise is associated with how secure property rights to the resources are and, more generally, the degree of uncertainty regarding management frameworks.

Two case studies on Spain and Japan are provided to highlight the way in which globalisation has taken place in the harvesting sector through access arrangements. However, the presence of Distant Water Fishing Nations (DWFNs) is declining in many parts of the world. This is in part due to the role that governments have played in recipient nations as developing countries are in many cases maintaining control over their resources in order to promote their own fishing industries and enhance value addition. A further case study on Mauritania and Namibia demonstrate different approaches to globalisation and the key role that Namibian government policy has played in prioritising long-term domestic development of the fishing sector.

Policy implementation gaps exist in the areas of access to resources, domestic fisheries management settings, and high seas governance. At a very general level, the quest for increased access to resources makes the world's fisheries a shared problem that requires action at the global level. To reap the benefits and opportunities of globalisation, global fisheries need to be managed sustainably. Developing countries need to reassess domestic fisheries management and development needs of the fisheries sector while

strengthening fisheries governance and associated institutions. Developed countries need to reduce excess fleet capacity and subsidies associated with fleet operations; reassess the need for trade barriers for developing countries' value added products (tariff escalation); provide development assistance and capacity building; and when negotiating fisheries access agreements, these should be "clean" of interference from other policy domains.

In **aquaculture**, farming will continue to grow in importance for fisheries markets. Globalisation in aquaculture occurs through foreign direct investment in the sector and through outsourcing of the different production processes. Differences in production and transport costs are important elements influencing investor decisions regarding production sites.

The key challenge for policy makers is to ensure that aquaculture can benefit from the opportunities globalisation brings, while reducing the risks associated with intensive farming. This will require regulation in a number of areas that include the environment, the use of space, market access, governance of the industry, food safety and animal health and research. Of importance is the contribution aquaculture strategies and action plans make to ensure sustainable production, market acceptance and the ability for products to enter into trade. In this regard, only some countries heavily engaged in aquaculture have developed national plans. In addition, aquaculture in developing and developed countries differs, with the former mostly made up of small-scale family holdings. In developing countries, small-scale producers may require access to finance, capacity-building and technology transfer to be able to meet the requirements of export markets.

Globalisation in the **processing** sector takes place along three principal paths; 1) through outsourcing of production processes to outside companies; 2) through the expansion of a company's base (setting up companies abroad, acquisitions etc); and 3) through global sourcing of raw material. Globalisation is the outcome of the search by processors for stability and security in raw material supply and quality, while simultaneously seeking opportunities to reduce costs in an industry characterised by increasing competition from fish and other foodstuffs.

The regulatory environment in the processing sector is primarily concerned with trade measures and seafood safety. High costs and lack of resources mean that many developing countries cannot meet standards, reducing their opportunities to benefit from globalisation.

Important policy challenges face the processing sector as a result of globalisation. Government intervention through the regulatory environment will impact the area of market access and the capacity of developing countries to meet increasing numbers and stringency of standards to ensure food safety and quality. Both developed and developing countries are affected by tariff escalation in relation to value-added fish products and policy gaps remain in easing this burden. There is a particular need for substantial progress in the DDA negotiations in regard to market access by reducing non-tariff barriers and ensuring technical assistance and capacity building in developing countries. Finally, as expansion through acquisitions are increasingly featuring as a strategy of the largest processors, a more transparent and deregulated investment climate would help ensure that the opportunities brought by globalisation are realised.

Globalisation in the **retail** sector begins by tracing changing retail trends that have led to the current market dominance by retailers and as a primary distribution point for fish. Supply structures for the sourcing of fish are changing to fit the demands of retailers for consistency and volume from suppliers. The retail industry is experiencing both expansion and consolidation. The rise in power of retailers is also felt in the regulatory sphere. As retailers have direct contact with consumers, they are vulnerable to issues that may challenge their reputation. Retailers are increasingly held accountable for local and global needs

and concerns, such as social responsibility, environmental impact and sustainability, which impact down the value chain.

Powerful retailers are leading the way in industry standards through the use of private labels and in-house standards in the areas of safety, quality and the environment. These standards could become industry-wide de facto standards. The key policy challenge facing governments in relation to the retail sector is how to respond to the increasing role of private standards. In light of the complexity regarding the number of and relationships between standards, policy options include the harmonisation of standards or the provision of minimum standards. Policy-makers will need to balance the use of market demand to meet socially-desirable goals with the potential risks of a loss of market access by developing country producers. In this respect, the role of public policy may be to assist developing country producers in meeting standards in order to benefit from globalisation.

The purpose of identifying and analysing **issues across the fisheries value chain** is to highlight areas that are not linked to a particular value chain element. Policy makers influencing these areas have to encompass a large variety of complex policy issues. The four themes considered are: the role and impact of opinion formers; fish as one element of the food basket; dealing with irresponsible activities in fisheries; and global versus local operators.

GLOBALISATION IN THE FISHERIES VALUE CHAIN

Background to the Study

1. Over the past decades, global markets for fish and fish products have changed considerably and continue to do so. In search for new business opportunities, reduced production costs and/or profitable investments, fisheries operators along the value chain (fleets, processors, distributors and retailers) have turned to opportunities located abroad. This has been made possible as markets have become closer and more integrated though the reduction or abolishment of trade, investment and service barriers and as information and transport technology has advanced. The fisheries sector has undergone steady "internationalisation" over past decades, driven principally by a quest for access to resources and raw material.

2. The process of increasing interdependence between fisheries markets has been occurring for decades, if not centuries. In the example of cod fisheries, mastering the drying of cod by the Vikings made it possible to fish in the Northern hemisphere for markets in other parts of Europe. Later, from the fifteenth century onwards, the development of salting techniques made it possible for Basque and Portuguese fishers to explore the rich banks off the Newfoundland area to satisfy a market-craving for salted cod, or *"bachalao"* [1]. Although the term "globalisation" was not in use, there was, nevertheless, interaction and increasing interdependence across countries and continents in the fishing industry, reflecting the fact that fisheries resources are not necessarily located in the vicinity of major consumption centres.

3. There are many ways to look at globalisation. A quick search of the web provides numerous definitions of the term. A common theme is that globalisation is viewed as a process towards more interdependence between economies/countries. However, different views emerge with respect to how interdependence among countries is interpreted; i.e. is it just market aspects or does globalisation extend to people and cultures, languages etc. Much of the debate in recent years (for or against globalisation) has taken place against the background of a lack of a shared vision of what to include.

4. The problems and issues that the globalisation process potentially gives rise to in the case of natural resources and sustainable development were raised by the Johannesburg World Summit on Sustainable Development meeting in 2002 (Box 1).

[1] *Cod: A Biography of the Fish that Changed the World* by Mark Kurlansky. Jonathan Cape, London, 1997

Box 1. Paragraphs 11 and 14 from the WSSD political declaration

Paragraph 11. We recognize that poverty eradication changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development.

Paragraph 14. Globalisation has added a new dimension to these challenges. The rapid integration of markets, mobility of capital and significant increases in investment flows around the world has opened new challenges and opportunities for the pursuit of sustainable development. But the benefits and costs of globalisation are unevenly distributed, with developing countries facing special difficulties in meeting this challenge.

5. "Fisheries globalisation" needs to take into account the specific context in which globalistion takes i.e. in aquaculture systems[2] or capture fisheries that may lie within the EEZs of countries or on the high seas and are thus subject to different sets of regulatory frameworks. Hence, "fisheries globalisation" is a process that can be inhibited or fostered by various drivers including the trading regime, national and international rules on investments and services, national regulations that deal with food safety, labelling, migration, nationality requirements for fishers etc. as well as international fisheries arrangements (e.g. UNCLOS, UNFSA).

6. Against these observations, the OECD's Committee for Fisheries is undertaking a study on the opportunities and challenges of globalisation in the fisheries sector (Box 2).

Box 2. OECD Committee for Fisheries Study of Fisheries Globalisation

As agreed at the 95th Session in 2005 when the Committee for Fisheries set out to do a Study of Fisheries Globalisation the project:

"…….should outline the broad range of consequences of globalisation for the sector, actual and potential inhibitions to adjustment to globalisation, and how these might be addressed. The project should focus on particular issues including how uneven regulation and management of fisheries worldwide gave rise to a range of opportunities and risks from the process of globalisation. The costs of policy inaction, the linkages between OECD and non-OECD countries as well as policy coherence were also highlighted as areas of concern. The value chain approach was found to be a useful way to frame the project." [AGR/FI/M(2005)1].

7. A number of papers were subsequently developed and discussed by the Committee. Furthermore, in April 2007 the Committee hosted (jointly with the FAO Secretariat) a Workshop on the Challenges and Opportunities of Fisheries Globalisation. These elements have been the substantive material on which this report has been developed.

[2] Which also has implications for aquaculture insofar as production is dependent on feeds from wild fisheries.

Defining Globalisation

8. In a written submission to the United Kingdom House of Lords Select Committee on Economic Affairs Inquiry into the global economy, the former Chief Economist of the OECD, suggested that[3]:

> *At the OECD, globalisation is interpreted as a process towards closer economic integration of markets. Viewed from this perspective, globalisation is not a new phenomenon, but an ongoing process that has been, by and large, accelerating over the past decades. More integrated markets offer potential benefits that improve our material well-being, but also imply adjustment costs and pose challenges for policy. Perfect integration would imply identical prices for identical goods and services. Defined in this way, the evidence suggests that we are still far from a globalised or fully integrated world economy. There are no compelling reasons, however, to suggest that, spurred by new information and communication technologies as well as by business strategies and public policies, the process will not continue to evolve.*

9. As demonstrated in the above quotation, it is the closer economic integration of markets that matter. Closer economic integration of markets happens through traditional trade (more cross border movement of goods), increased foreign direct investments (setting up processing plants abroad) and the use of foreign services (processing part of the products abroad, use of service facilities abroad). In essence, transborder production networks will emerge where different elements of the value chain, to varying degrees, take part in the globalisation process by using the most profitable location or source for their activities.

10. When applied to fisheries, and with due regard to the natural renewable resource characteristics of the sector, the policy challenges that this process gives rise to are anchored in formulating, developing, adapting and implementing management frameworks that can accommodate the pressures stemming from the process of globalisation without compromising the sustainability of the resource. Key features of these challenges include the implementation of appropriate management models (which may be dependent on the particular resource situation), dealing with structural adjustment, and garnering the political will to move forward.

The Value Chain Approach

11. When discussing the study, the Committee for Fisheries decided that a value chain approach would be the most useful way to organise the study. This was done for two main reasons: the value chain as an organizing framework can help ensure a more comprehensive coverage of the issues; and the value chain approach will help understand the linkages between its constituent elements (harvesting; aquaculture; processing; distribution/retail and consumers). In a world characterised by having reached maximum sustainable levels in many capture fisheries, it is important that the total value generated by the fisheries value chain (from harvesters to consumers) is maximised. Adopting a value chain approach will help identify how to maximise the total contribution to society of globalisation in the sector. Likewise, when considered over time, such an approach allows the identification of developments in the value chain e.g. increasing concentration, forward integration. The fisheries value chain consists of harvesting and

[3] Written submission by Ignazio Visco, OECD Chief Economist, October 2001, available on the OECD website on http://www.oecd.org/NewsArchives/0,2552,en_2649_37443_1_1_1_13_37443,00.html

aquaculture; processing; distribution/retail and consumers. The value of the total fisheries value chain has been estimated (Glitnir Bank, Workshop) to be USD 400 billion (annual turnover).

12. Features of the **harvesting** element include that fleets are potentially highly mobile and can fish domestic, high seas and foreign waters. The regulatory environment is of considerable importance in shaping the activities of vessels; both domestic fisheries management policies and international regulations (for example as enumerated through RFMOs) are involved in shaping the fishing activities; where and how they can take place and determines who has access to resources. Furthermore, it is also important to consider that fishers often are in remote coastal communities with few alternative employment opportunities or transferable skills. The points are important for how policy responses can be formulated to address changes in fleet structures. It is also important to recall that the contribution of fisheries to the economy may be very different in developing vs. developed countries. The value of global landings from capture fisheries totalling 95 million tonnes has been estimated at USD 84.9billion (FAO 2004 figures). Of the total landings from capture fisheries, some 34.8 million tonnes are used for non-human consumption purposes (fishmeal, oil etc.)

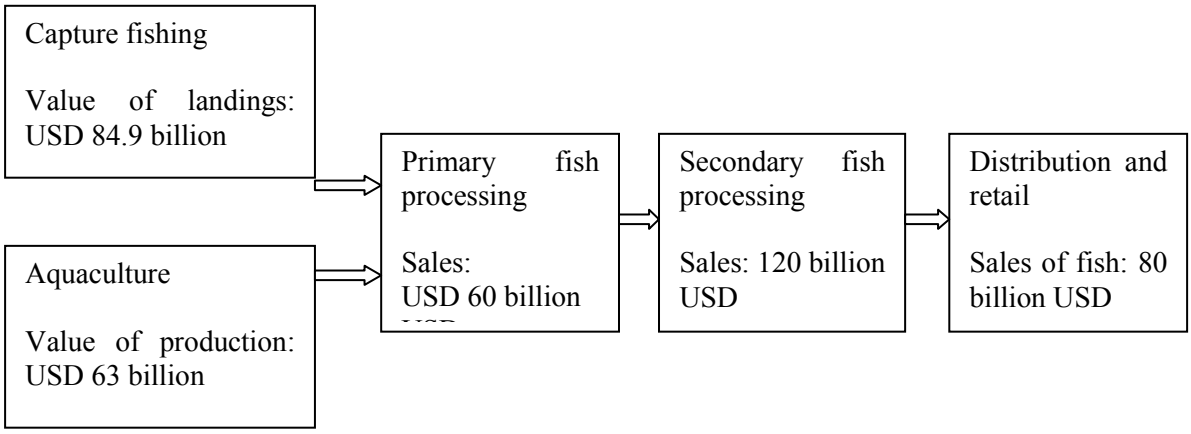
13. **Aquaculture** has grown considerably over the past couple of decades; for certain species the sector has become the dominant supplier, notably for salmon, tilapia and shrimps. As wild capture of certain species has fallen, the sector has developed to fill the gap. However, for carnivorous species the sector is also dependent on capture fisheries for the production of fishmeal and oil, which continues to be an important element in feed compounds. A major contributor to world aquaculture production is China. Total world production from aquaculture is estimated to be 45.5 million tonnes in 2004, valued at USD 63 billion with 70% a result of Chinese production (FAO 2006).

14. The **fish processing** sector has undergone structural adjustment in OECD countries in recent years, spurred by technological developments, cheaper and more efficient modes of transportation and readily available cheap labour in developing countries. The fish processing value chain element buys fish from harvesting or fish farms, usually as headed and gutted. Fish processing transforms the fish (primary processing: filleting; secondary processing: further developed products *i.e.* canning, ready meal products) into products that can be consumed. Combined, primary and secondary processing is estimated to have a value of USD 180 billion (Source: Glitir Bank).

15. **Distribution/retail** plays an increasing important role in modern society where convenience of consumers are key to sales of fish and fish products. Hence, also in this element major changes have happened in recent decades. By 2001, in France, two thirds of all fresh fish sales took place in supermarkets, a part that has been steadily rising as fish is seen as an important element of image. Moreover, the seven largest supermarkets chains in France account for 90% of all supermarket sales. This suggests a strong concentration of buying power. The value of the distribution and retail elements of the value chain has been estimated at USD 80 billion (Source: Glitnir Bank).

16. When looking across the value chain the following picture emerges:

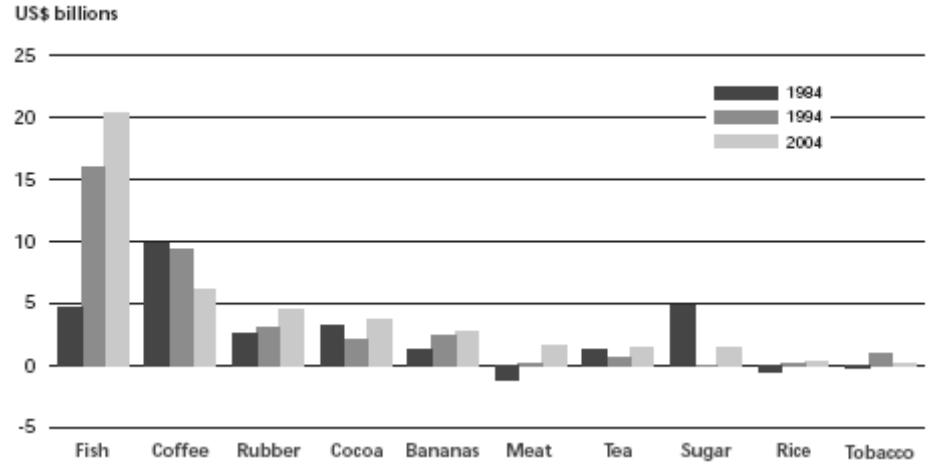
Figure 1. The Fisheries Value Chain



Source: FAO and Glitnir Bank

17. It is important to recognise already at this early stage that fisheries play a key role for developing countries. Of all food and agriculture commodities traded in the world, fisheries are a particularly high income generator for developing countries. In addition to being an important export earner (see Figure 2), fisheries is in many developing countries a significant employer and provides important protein.

Figure 2. Net Export from Developing Countries of Selected Commodities



Source: FAO, SOFIA 2007

18. There are particular issues associated with developing countries and globalisation revealed throughout the value chain. The Committee's earlier work on Policy Coherence for Development in Fisheries has revealed a number of areas of incoherence, which has impacted developing countries' ability to benefit from globalisation. In studying globalisation in the fisheries sector, similar issues arise. A key message remains valid: developing countries require assistance to more effectively partake in a rapidly changing world of fisheries. For developed countries, for reasons of enlightened self-interests, increased

focus on coherence between various policy areas that influence the fisheries sector (fisheries, trade, investments etc.) is needed.

Globalisation in the Value Chain

19. In each element of the fisheries value chain there are a number of ways that globalisation occurs and manifests itself, including through access to resources, trade, the 'slicing up' of the value chain in to its constituent elements (fragmentation), investments and services. The choice for the company of a particular way of sourcing will depend on a trade off between, on the one hand, costs of transaction in goods and, on the other, the costs involved in setting up new capital infrastructure including a consideration of time horizon and distance to markets. Beyond the pure economic trade off in deciding which form of sourcing is economically feasible (in particular relative costs of labour and capital, time frame, distance to markets and supplies as well as trade barriers) and the technical capacities of the host organisation, other considerations to be addressed include management and control of production processes. For example, for highly sensitive products (high tech or high standards for sanitary/hygiene, military) companies may wish to retain full control over the entire production process rather than outsource, i.e. risk management, although it may be technically feasible to do so, and profitable.

20. The multitude of sourcing possibilities makes it difficult, from a statistical point of view, to follow what's actually going on. While the trade may be captured in foreign trade statistics (assuming there is a tariff line for the particular product and/or subcomponent - which is not the case for certain fish products), the operation of joint ventures, licensing arrangements and international production through fully owned operations may not, statistically, be captured in the traditional statistics systems.[4] This has given rise to debate as to how to build indicators of globalisation in a world where the organisation of productions and markets is constantly undergoing change. This is no different in fisheries and hard evidence may not always be easy to establish.

Top Line Societal/Demographic Trends Influencing the Fisheries Value Chain

21. There are a number of demographic trends that also impact on the fisheries value chain; these trends have nothing to do with globalisation *per se*, but are increasingly difficult to disentangle from the overall developments. They concern in particular certain demographic developments (such as rising world population), ageing (in particular in developed economies), technological developments and a fast developing transport infrastructure throughout the world. Such "background" developments are not unique to fisheries. Meanwhile there are certain developments that are particular to fisheries and which have made it promising for fishing companies (harvester, aquaculture and processing) to go global. Chief among these have been access to resources and raw material, either as trading or through fleet operations; these developments have been reinforced by poor domestic management in many developed countries where fisheries raw material has become scarcer.

Outline of Study

22. At the 99th Session, following the Workshop on the Opportunities and Challenges in Fisheries Globalisation, it was decided that this paper be constructed using the value chain approach. For each value chain element the paper describes the key issues and developments (such as why do companies globalise) and highlights and discusses the policy implementation gaps in policy areas relevant to the particular value chain element. The paper also discusses what government action might be taken.

[4] For a more detailed discussion of these issues see Art Ridgeway "Data Issues on Integrative Trade between Canada and the US Measurement Issues for Supply Chains" paper for CTPL Conference, December 2006.

23. In drafting this study, information from the Workshop held in April 2007 was particularly helpful. In addition, major fishing companies from each value chain element have been surveyed; the information bases are internet records from the 30 largest publicly listed companies (by market capitalisation). These companies post a wealth of financial and other information on their websites to comply with company legislation for listed companies. This does not mean that smaller companies or companies in private hands do not globalise; however information on their activities are much harder to acquire.

GLOBALISATION IN THE HARVESTING SECTOR

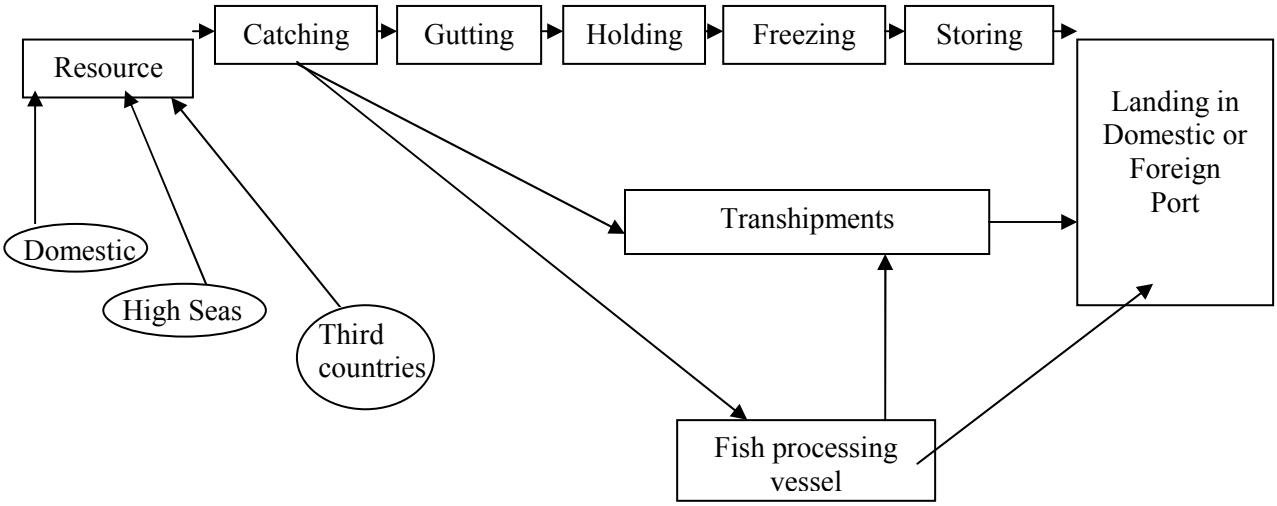
Globalisation in the harvesting sector is driven by the need to secure access to fish. When fishing opportunities diminish in domestic waters, fishing fleet operators may deploy their harvesting capacity elsewhere - often in foreign waters or on the high seas. Conversely, when harvesting opportunities in domestic waters exceed domestic harvesting capacity, countries may open their fishery to increased vessel and/or labour access from abroad. Policy implementation gaps for developing countries include reassessing domestic fisheries management and development needs of the fisheries sector while strengthening fisheries governance and associated institutions. For developed countries, reducing excess fleet capacity and subsidies associated with fleet operations; the reform of access arrangements; development assistance and capacity building remain policy issues to be addressed.

Globalisation of the harvesting sector

24. Globalisation in the harvesting sector is driven by the need to secure access to fish. Access to resources can manifest itself in numerous ways, including through access agreements; joint ventures; direct investments into foreign countries which offer quotas possibilities; chartering and high seas fishing (regulated and unregulated).Whether this also entail a reflagging of the vessels will depend on the domestic and foreign regulatory framework for access. The interest for the vessel operators to seek access abroad depends on the value of the fish caught, the amount of excess capacity, subsidies for vessel operations, access payments and the variable costs of the fishing operation (fuel, labour etc.).

25. Harvesting (defined from catch to landing) can be broken up into several elements; catching; holding/storing; gutting; freezing; landing. Figure 3 is an example of how operations in the harvesting sector of the value chain may take place.

Figure 3. The Harvesting Sector



Source: OECD.

26. The "normal" case for fishing vessels is to gut, store, cool/ice/freeze and transport the fish until landing in port. Other possibilities include the transfer of fish at sea to mother ships for further processing into more or less elaborate products, or simple transhipment at sea for transport to a landing site (see Box 3). Conditions of domestic fisheries operations are important for vessel owners in their decision to go "global". Most countries' fisheries legislation is very prescriptive as to how fishing operations are to take place within their EEZ, by who, which gear and under what conditions. To a great extent, this will frame the possibilities in the harvesting sector of seeking alternative ways of catching fish. For example, for sanitary/hygiene reasons (freshness), some countries stipulate that fish have to be landed within a certain number of hours of being caught and only gutting and icing is permitted. Other countries do not allow the use of factory vessels within their EEZ, transhipments, foreign vessels for harvesting etc. Such regulations - although they may offer other benefits - may insulate the fishing fleet from certain opportunities offered by globalisation. Seen from the perspective of public authorities, however, regulations are essential for ensuring a proper functioning of the fisheries management system and adherence to national and international standards.

Box 3. Transhipment at Sea

The Department of Environmental Management in the United States issued a permit to Mayflower International Ltd. authorizing the Russian-flagged *M/V Dauriya* to anchor in Rhode Island waters from February 2003 until April 2003, to participate in joint venture commercial fishing operations with local fishermen.

The permit allowed the **M/V Dauriya** to purchase up to 5 000 mt of Atlantic mackerel and 5 000 mt of sea herring from local fishermen, process the fish whole and then periodically transfer the frozen, packaged fish to another vessel for shipment overseas. The operation is important to local fishermen because there is insufficient local capacity to process mackerel and herring, which are available off southern New England in surplus quantities. The operation is important to the Russians because of the relatively strong foreign market for these species. Thus, the operation will have the effect of boosting economic activity in the state by enabling local fishermen to harvest and sell species that would otherwise go unharvested. Last year's operations resulted in almost USD 2 million in direct revenues generated by the purchase of the fish.

Source: Department for Environmental Management, State of Rhode Island; <www.dem.ri.gov/news/2003/pr/0124031.htm>

33. The principal concern for harvesting operators when seeking opportunities for "globalising" is associated with the lack of secure property rights to the resource and, more generally, the unknowns in fisheries management (including stock situation and predictability). As a result, investments in the harvesting sector may be associated with more risk. As observed by Macfarlane[5], the overwhelming majority of international investors are processors of fish products; only a minority have any investment in the catching sector. Therefore, globalisation through capital markets is an unlikely option in the harvesting sector partly due to restrictions (see work on FDI in the Fishing Industry) on investments and partly due to lack of secure long term property rights. Consequently, the harvesting sector mainly globalises through various types of access arrangements to foreign countries' EEZs and through harvesting on the high seas.

34. Nevertheless, there are some companies that are global seafood harvesters. Among the important companies from OECD countries that own fishing fleets abroad are: Austevoll Seafood (Norwegian company with fleets in Norway, Peru and Chile; mostly for fish meal and oil), Pescanova (Spanish company with worldwide fleet operations including in South Africa, Argentina and Mexico), Nippon Suisan Kaisha Ltd (Japanese company with fleet operations in Indonesia, New Zealand, Chile and Argentina), Maruha Corp (Japanese company with fishing interests in New Zealand, Indonesia, Bangladesh, Madagascar and Mozambique). Outside of the OECD countries important operators with harvesting interests outside of their country includes Pacific Andes and China Fishery Group.[6]

35. The period since the 1980s has seen marked changes in the internationalisation of the harvesting sector. The advent of 200 mile exclusive economic zones reduced the fishing possibilities for some countries that had been fishing at great distance from home ports. Following the extension to 200 miles, Distant Water Fishing Nations (DWFN) had to now negotiate access to marine resources within the 200 mile limit of third countries or fish on the high seas; most often fleets were deployed in those countries' waters where they previously had been fishing. In this regard it should be mentioned that if a coastal state does not have the capacity to harvest its entire allowable catch it must give other states access to the surplus. The following will briefly look at the situation regarding access agreements and high seas fisheries. Failing access arrangements to foreign countries waters an alternative is to deploy the fleet overcapacity on the high seas under RFMO arrangements or as "IUU fishing" vessels.

Access Agreements

36. As mentioned, an important event for the harvesting sector was the extension of fishing zones to 200 mile EEZs, which took place from 1977 onwards and which subsequently was codified in the 1982 UNCLOS. The harvesting capacities built in the years up to the extension of EEZs were abruptly idle and their "opportunity costs" decreased considerably. As a result, many vessels were available to fish under various types of access arrangements or on the high seas, on a low cost basis (with a view to just covering their variable costs). This may help explain the proliferation of access agreements following the extension, in particular from traditional long distance fleets such as Spain, Portugal, France and Japan. Different approaches were adopted including government to government arrangements, private to government or private to private, joint ventures, chartering, reflagging into the host country etc. The primary objective was to obtain access to resources in order to continue to supply traditional markets and consumers with fish. This happened as long distance fleet opportunity costs were low as the capital tied up in the vessels had no alternative use.

5 Paper presented to the Workshop on the Challenges and Opportunities of Fisheries Globalisation.

6 Based on a review of web sites of the 30 largest (by market capitalisation) publicly-traded fishing companies in the world; the information confirms that fish harvesters are generally focussing on domestic waters. We have found no cases of fully owned subsidiaries of companies in OECD countries with harvesting interests in other OECD countries confirming the observation that the restriction on FDI in harvesting are particular severe.

37. Total marine catches from distant water fisheries reported by DWFNs increased from less than one million tonnes in the early 1950s to about 8 million tonnes in 1972, before declining rapidly from 1991 to about 4.5 million tonnes, remaining stable at that level since 1991. As a proportion of total marine captures, those reported by DWFNs reached a maximum of 15.5% in 1972 and then declined to about 5%, where they have been stable since 1993. This is likely to reflect a reduction in the profitability of long distance fishing in developing country waters caused by high costs of maintenance of the long distance fleets and increasing costs of access. Although access agreements offer some opportunities for deploying fleets these are often at the expense of public coffers that provide incentives (which may be over and above market rates) for securing access. For all these reasons it is likely that access agreements may be more a transitional phenomena, in particular as coastal, mostly developing states gradually start develop the domestic fishing industry.

38. In order to understand the way in which the harvesting sector has globalised, it would be helpful to consider the experiences of two countries. The following two case studies show how globalisation has occurred in the harvesting sector through industrial organisation to access resources by Spain (see Box 4 below) and Japan (see Box 5). Although both Spain and Japan are Distant Water Fishing Nations, the type of agreements they negotiated differed. Nevertheless, comparing the two countries shows that similar outcomes were reached; an initial push into developing country fishing areas that expanded globalisation in the harvesting sector and resulted in large volumes of extraction, followed by retraction over the past decade.

39. The EU has made use of access agreements with countries in which the EU fleet has had traditional fishing activity, in particular in Africa. Spain has been the dominant EU beneficiary, amounting to 82% of the value of such bilateral agreements. By the late 1990s, EU payments for access to ACP countries accounted for one-third of the EU fisheries budget (USD 130 million annually). Since 1990, outside the EU, more than 100 agreements have been created by coastal states around the world, approximately forty of which involve access for Japanese fleets (Dommen, 2000).

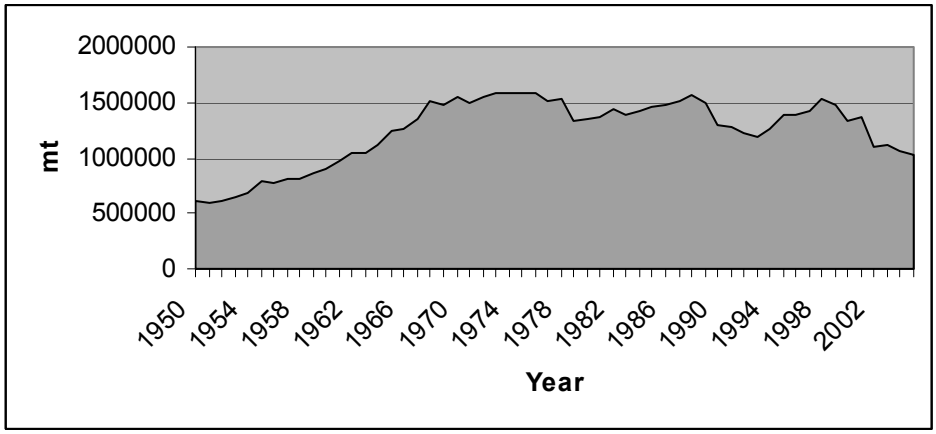
40. FAO collects catch data according to geographical area and such data has formed the basis for the analysis. By tracing the movement of vessels from domestic fishing grounds to distant waters, a ‘map’ of the development of globalisation in the harvesting sector is revealed. A reference map can be found in Annex 1. However, data is reliant on records produced for the FAO by its member countries. As a result, it does not take into account flag of convenience vessels (that may have few economic ties to the country flag it is flying), nor the role of joint venture agreements.

Box 4. Case Study: Spain

Fishing operations by Spanish fleets traditionally centred on North Atlantic fishing grounds, fairly close to home market. As technological capacities developed from salting to refrigeration, slow-freezing techniques and fast and flash freezing methods, geographical expansion of the harvesting sector has been made possible. This has allowed Spanish vessels to access resources in developing countries that are far away from their markets. Spanish vessels have been fishing in developing country waters since the early 1960s.

Spain currently has a large fishing interest in FAO Statistical Area 34[7], which extends along the west coast of Africa from Morocco to the Democratic Republic of Congo. This area is very productive due to upwelling and characterized by a high catch rate and by a historical presence of DWFNs. The main species fished are various bluefish (sardines, pilchard), horsemackerel, skipjack-, yellowfin- and bigeye-tuna. Ocean catches by DWFNs in this area reached almost 88% of total oceanic catches in 1961 but declined to 33% from the 1970s onwards (IK: in 1970 (Garibaldi, Luca and Luca Limongelli, 2003). Figure 4 shows total catches by Spain in Area 34.

Figure 4. Marine harvest (all species) by Spanish vessels in FAO Area 34

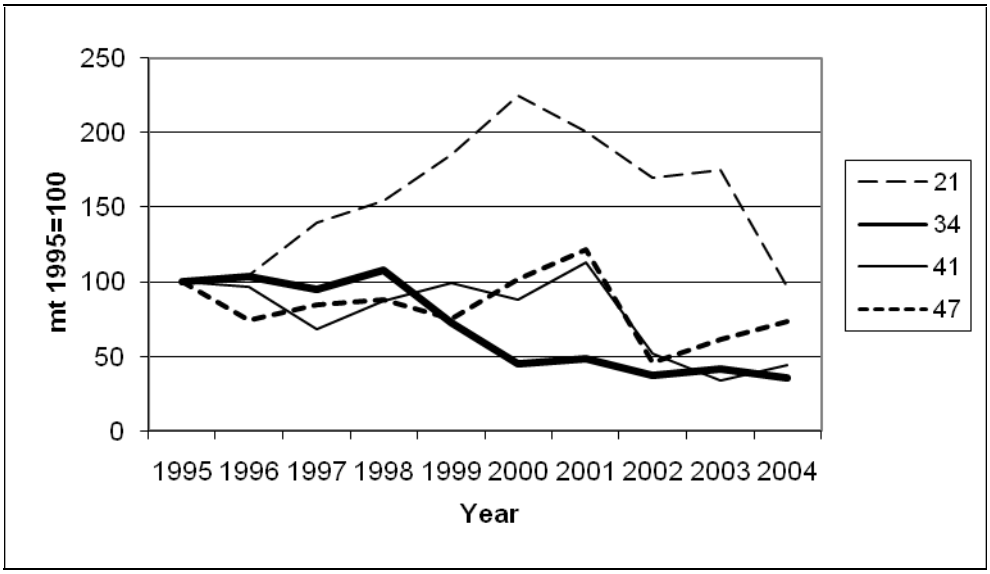


Source: FAO Fishery Statistics – Capture Production, Vol. 98/1

41. Figure 5 is a closer look at areas that have traditionally been important to Spain in the Atlantic.

7 Eastern Central Atlantic

Figure 5. Catches by Spanish Vessels in 'Third Countries'



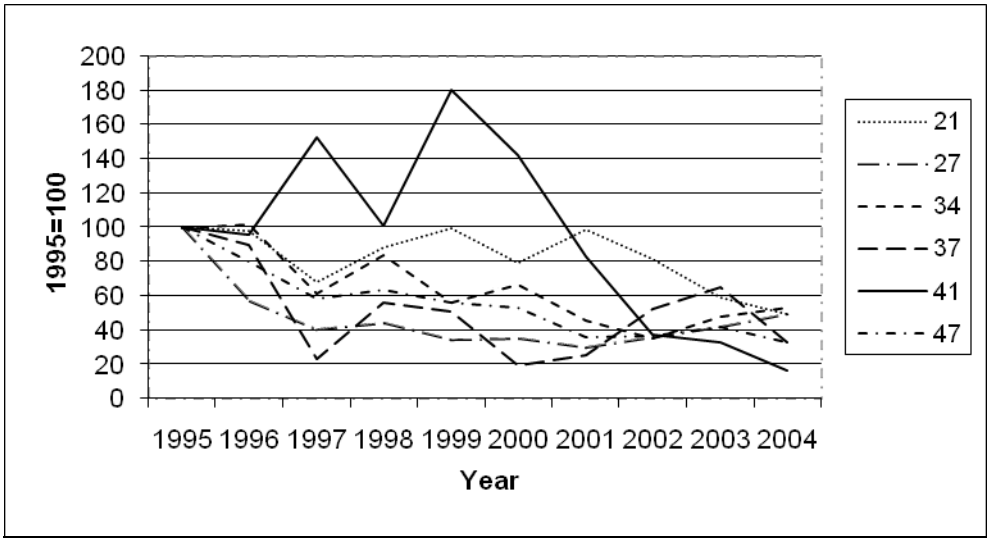
Source: FAO Fishery Statistics – Capture Production, Vol. 98/1

Box 5. Case Study: Japan

Japan's fisheries agreements do not directly involve the Japanese government. They are either agreements between the Japanese Tuna Association and coastal countries or license fee arrangements between a specific Japanese company and fisheries authority of a coastal country, where the financial compensation is considered a private agreement (Mbithi, 2006).

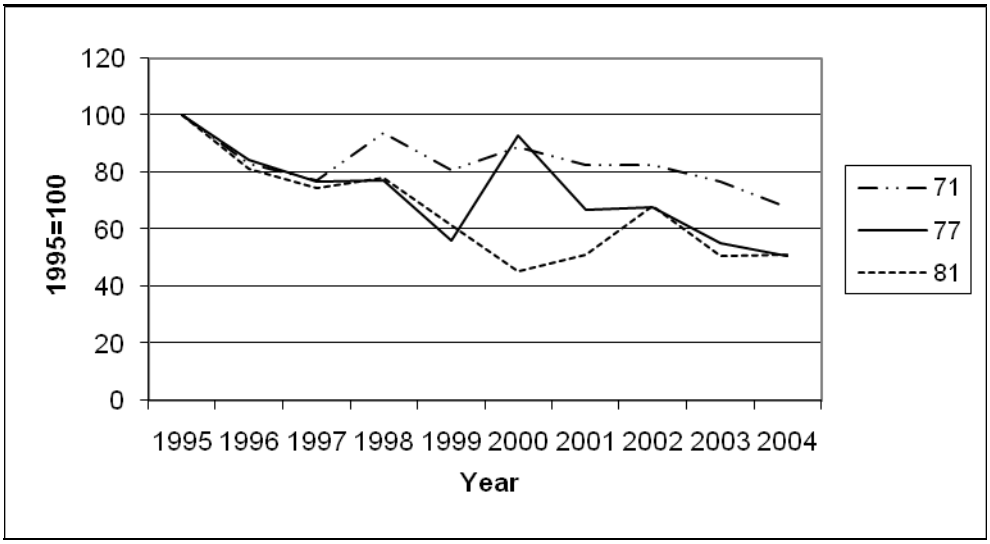
Japanese vessels operate in the EEZs of Pacific Island states, some African states and China. Japanese expansion occurred until the 1980s when access to fishing grounds outside Area 61 where Japan is geographically based, became extremely limited following the introduction of the 200 mile zone. Over the past decade Japan's presence in foreign waters has continued to decline as depicted in Figures 4 and 5.

Figure 6. Japanese Catches in the Atlantic Ocean (Areas 21, 27, 34, 37, 41, 47)



Source: FAO Fishery Statistics

Figure 7. Japanese Catches in the Pacific Ocean (Areas 71, 77, 81)



Source: FAO Fishery Statistics.

42. The main conclusions drawn from the case studies highlight that globalisation - through various forms of access arrangements - has taken place in the harvesting sector. However, the expansion has now ended and the presence of DWFNs abroad is declining. The section will briefly look at what has happened with two developing countries that have hosted DWFNs; Mauritania (Box 6) and Namibia (Box 7). These two countries have taken different approaches to benefit from distant water fishing. In the case of Mauritania, the country faces many problems as a result of overfishing by distant water fleets, leaving it with large cash reserves but little internal fisheries sector development. On the other hand, Namibia,

although initially opening its EEZ to distant water fleets, then undertook a policy of 'Namibianisation' and reserved access to its resources for its domestic industry, which has focused on domestic value-addition. This has allowed Namibia to be an exporter of fish products and benefit from globalisation through enabling the industry to operate further up the value chain where more value can be gained. The different approaches taken by Mauritania and Namibia's governments have brought different results to the domestic fishing industry and underscore the role that governments play in addressing the opportunities and challenges that globalisation brings.

Resource-Rich Developing Countries

Box 6. Case Study: Mauritania

Mauritania's coastline stretches for around 720 km and its waters are the source of a strong, steady upwelling, providing rich fishing grounds. The Mauritanian EEZ has 170 marketable species out of a total of some 350 identified species (excluding seaweed), consisting of cephalopods, crustaceans, demersal fish, pelagic fish and clams.

Mauritania's use of fisheries access agreements to provide revenue from its fishing grounds is based on the UNCLOS principle that in the event of a surplus that it does not have the capacity to harvest itself, the coastal state has a duty to allocate some of these resources to other states. Mauritania's most important access agreement is with the EU, which provides Mauritania with substantial financial resources. The 2001-2006 agreement with the EU resulted in an annual payment of EUR 86 million[8]. Financial compensation for access generally amounts to about 2-17% of the market value of the catch (ICSTD, 2006). A new agreement covering 2007-2012 has been signed for a total of EUR 86 million per annum plus EUR 22 million per annum in fees paid by vessels directly to the Mauritanian government, resulting in a total payment over five years of EUR 648 million, a 61% increase on the 2001-2006 agreement (European Commission 2006 and European Parliament 2006).

The fisheries agreements have provided Mauritania with a large inflow of foreign currency revenue that has allowed the country to cancel a part of its foreign debt, estimated to be around USD 819 million. It particularly provided a form of income during lean years, before Mauritania gained status as a petroleum-producing country (Toueilib 2007).

In the meantime, access agreements have postponed the development opportunities of the Mauritanian domestic harvesting industry. While the Mauritanian fleet lacks the technical requirements to access the resource, the employment situation on board foreign vessels also does not aid the development of the domestic industry; only 10% of available Mauritanian seamen are employed on EU vessels. As a result, the domestic fishery sector's contribution to GDP, estimated at over 12% in the 1970s, now barely exceeds 5%. The percentage of Mauritanian vessels laid-up on a temporary or prolonged basis is estimated to be over 25%, while almost all the remainder are experiencing financial difficulties (Toueilib 2007).

Concurrently, the Mauritanian processing industry has suffered as a result of falling supplies from both domestic and foreign vessels landing in Mauritanian ports. In the 1960s, when the Mauritanian government based its fisheries management system on open licences and developed infrastructure as a means of localising fishery rents in Mauritania, compulsory landings in Mauritanian ports were part of fisheries policy. However, this was opposed by some domestic and foreign vessel-owners due to a lack of support services and poor technical conditions in ports. Indeed, Mauritania continues to lack capacity to undertake processing for the international market. Only 39 factories are export-approved and have a limited storage capacity of 700 tonnes. Voluntary landings in the 2001-6 agreement resulted in only 15 vessels landing catch, and this only exceptionally. Landings in Mauritanian ports are estimated at 100 000 tonnes a year or just over one-seventh of total catch in the EEZ. As a result, processing units operate at only 10% capacity, resulting in marginal employment in the sector (Toueilib 2007). This has compromised the sector's integration into the national economy and is a handicap for the expansion of Mauritania's industry.

95% of Mauritania's catch is exported unprocessed and virtually all demersal fish is exported raw. As a result, the creation of value-addition in Mauritania is extremely low, demonstrating how limited the sector is

[8] In comparison, the agreement with Senegal was EUR 16 million, EUR 3.9 million with Guinea and EUR 4.8 million with Seychelles.

integrated into the globalised economy.

In light of these challenges, access agreements have been re-evaluated by the EU in terms of their socio-economic and environmental effects. As part of the new (2007-2012) EU agreement with Mauritania, 11% of revenues are directed towards supporting the development of the local fisheries sector, in particular management tools such as enhancing fisheries governance, integrating the sector into the national economy and increasing the capacity in the sector.

Box 7. Case Study: Namibia

The Benguela ecosystem provides Namibia with a zone of nutrient-rich upwelling and consequently, rich fishing grounds. In 1990, Namibia gained independence from South Africa and inherited a heavily exploited fishery. Namibia embarked on a two-pronged policy approach; to ensure sustainable management of fisheries and to maximise benefits for Namibians. Today, fish stocks have stabilised, the fishing sector has increased its economic contribution to 26% of merchandise exports and the fisheries employment has more than doubled between 1991 and 1998 (Lange).

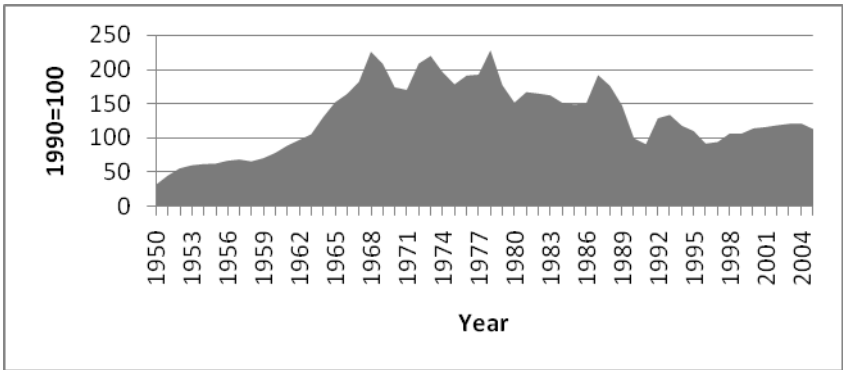
After Independence in 1990, many foreign vessels continued fishing illegally. Due to overfishing before and after independence, many stocks had to be rebuilt; TACs were introduced for all major species and levies charged on the basis of quotas allocated. Methods to restrict fishing effort such as a ban on trawling at shallow depths and 100% observer coverage on larger vessels were also introduced. As a result, in the first decade after Independence the total allowable catch (TAC) and landings of hake rose steadily.

A clear aim of Namibian policy has been to ensure that Namibians benefit from their resources. Consequently, the proportion of hake processed onshore has jumped from just 6% in 1992 to around 60% today (Minister Iyambo, 2007). The hake processing sector now employs 70% of the 14 000 permanent and seasonal workers in the industry (Maggi, 2005).

This has been accomplished through a domestic policy that prioritises the national sector over the selling of the resource to DWFNs. Whenever opportunities to catch fish become available, the Minister for Fisheries invites the public to apply for fishing rights. The aim is to ensure that Namibians get a fair chance to enter the industry and to facilitate the empowerment of previously disadvantaged groups. The result has been a fisheries sector contribution to GDP of 10.1% in 1998 from an initial 4% at Independence. 4.2% of this comes from fishing and 5.9% from processing (Oelofsen, 1999). Namibia now boasts a strong domestic fishing industry that not only operates without subsidies but contributes a resource rent to the government. Landings by Namibian vessels have increased while catches by all vessels in the south east Atlantic have been declining (Figure 9).

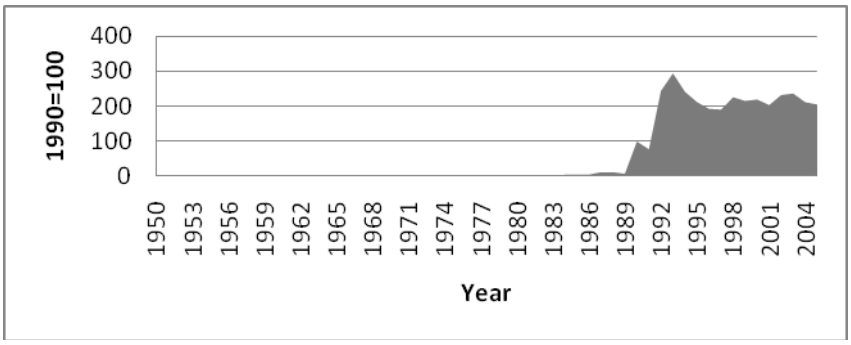
By retaining control of fisheries resources and enforcing property rights, Namibia has guaranteed the future of the domestic fishing industry as well as future development through value addition. In this process Namibia has been able to benefit from foreign direct investment (e.g. Pescanova is involved in Namibian NovaNam Ltd.) and the acquisition of skills and knowledge to further development. It also means that Namibia has entered the world trade system rather than merely as a resource-provider. Reform of European import tariffs is required for Namibia to truly capture value addition to be made from processing. In 2008, Namibia faces losing its ACP (Afro-Caribbean-Pacific) preferential tariff agreements with the EU – a major market for Namibian hake - unless a European Partnership Agreement can be agreed.

Figure 8. Catches by all Vessels in the South East Atlantic (FAO Statistical Area 47) Excluding Namibia



Source: FIGIS

Figure 9. Catches by Namibian Vessels in the South East Atlantic (Statistical Area 47)



Source: FIGIS

43. To summarise the four case studies, globalisation has taken place in the harvesting sector through access arrangements. However, this expansion has now ended and the presence of DWFNs abroad is declining in many developing countries that previously were hosts to DWFNs. Instead, developing countries are now maintaining control over their resources for the development of their own fisheries sector and in doing so, seek to benefit from globalisation at other entry points in the value chain. The key has been the change in government policy of developing countries to now prioritise long-term domestic development of the fishing sector coupled with decreasing profitability of the DWFN.

High Seas Fishing Issues

44. As mentioned, "going global" in the harvesting sector may also include fishing on the high seas *i.e.* transfer of fishing capacity to fishing under international arrangements (RFMOs) or by engaging in illegal, unreported and unregulated activities. As most fisheries managed by RFMOs are fully subscribed, there is little room for carrying out activities within such structures. As a result, existing or new idle capacity is likely to become engaged in IUU activities unless checked by domestic and international legal and fisheries policy frameworks.

45. By definition, it is difficult to get an overview of how much IUU fishing takes place on the high seas; these activities are camouflaged and information and data are therefore often anecdotal. As noted in

the Committee's earlier work on IUU[9], IUU fishing activities are an economic activity that will continue as long as it is profitable for fishing vessels to be engaged in such activities. The information available on IUU fishing on the high seas suggests that it occurs on fish stocks of predominantly high commercial value with easy marketability. Another observation is that, over the past two decades, the extent of IUU fishing has increased concurrently with globalisation in the fisheries sector. As a result, IUU fishing has received increasing attention from policy makers due to its negative economic, social and environmental impact. However, as long as the activity is profitable it will continue.

46. The Committee also highlighted that the principal cause for IUU actives is nested in domestic fisheries management and capacity policies; excess domestic fishing capacity generates a ready available and cheap source of fleets and fishers to seek out ventures on the high seas. It is therefore important that domestic fisheries policies ensure that excess fishing capacity is dealt with in an appropriate way through scrapping and through legislation that does not allow for fishing capacity to be exported and re-flagged to countries that do not observe UNFSA[10].

47. However, some IUU fishing persists and must be dealt with. Products from IUU fishing enter international trade and undermine the proceeds from legal fishing operations. Catch and trade documentation, traceability and higher penalties for infringements and improved cross country cooperation as highlighted by the Committee, are likely to have the highest potential net-payoff. A new approach to ensure that all non-members of RFMOs are actively involved and understand the IUU issue has also been raised, including a more "imaginative and constructive engagement"[11] with the fishing industry.

Policy Implementation Gaps

48. The following identifies the major policy implementation gaps concerning capture fisheries and highlight possible government actions that may be taken to address these issues. While, in many fisheries, opportunities are decreasing due to years of overexploitation, all countries, developed and developing alike, are exploring alternative ways of deploying their fleets i.e. getting more out of the capture sector. At a very general level, the quest for increased access to resources makes the world's fisheries a shared problem that requires action at the global level. To reap the benefits and opportunities of globalisation, global fisheries need to be managed sustainably. In this context, "global fisheries" covers both domestic and high seas fisheries, although for the latter there are some particular issues that need to be addressed.

Policy Coherence for Development

49. In "industrial" capture fisheries (as opposed to artisanal fisheries) developed countries have a major advantage for two principal reasons; those fisheries tend to be fairly capital intensive, and it is from developed countries that excess fishing capacity is readily deployed elsewhere. In addition, it is largely among the developed countries that fishing fleets are subsidised, which may give them an added advantage in buying access and/or lower their fishing costs. Hence, by and large, it would seem that developed countries have a major advantage over developing countries in terms of the industrial capture sector.

50. To underpin these observations it may be useful to recall one of the findings from the Committee's Workshop on Policy Coherence for Development in Fisheries: "Yet, in financial terms,

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9 *Why Fish Piracy Persists: The Economics of Illegal, Unreported and Unregulated Fishing* (OECD 2005) and *Fish Piracy: Combating Illegal, Unreported and Unregulated Fishing* (OECD 2005).

10 As observed by Michael Lodge: "...the freedom of fishing exists generally, but it is now very much a conditional freedom" with rules of RFMOs and the UNFSA being the principle frameworks.

11 *Ibid.*

distinct economies of scale characterise fish production and marketing. The scramble for access to dwindling fish stocks favour industrial fishing over small scale, artisan fishing.[12]" One of the major outcomes of the Committee's work on policy coherence for development in fisheries was the observation that a major policy implementation gap exists in the lack of coherence between fisheries policies and other policy domains. The fisheries policy and trade policy areas were a particular cause for concern. It would thus seem that it in the area of policy coherence, major advances are (still) needed.

51. In addition, in transferring know-how to developing countries, developed countries can assist in the establishment of sustainable and responsible management and governance structures and potentially ensure sustainably-sourced future supplies of fish to OECD markets.

Access to resources

52. As highlighted harvesting opportunities in foreign fishing zones have been decreasing. Excess harvesting capacity should be dealt with in an effective way (i.e. actively removing the excess capacity through scrapping schemes); as fleet capacity adjustment programmes are implemented in OECD countries fleet requirements for access arrangements should diminish over time. By the same token, as developing countries' capacity to fish and process fish domestically is augmented, they may find it more appropriate and wealth-creating to fish, process and trade fish themselves, rather than selling access.

53. It remains that access arrangements are manifold and complex because of the various incentives they create; they mix up a number of policy domains - most notably development assistance and trade - with fisheries policies. They are therefore difficult to deal with in any one way. Nevertheless, fisheries access agreements remain an area that has not yet been "liberalised" in line with traditional trade, whether in fish, fish products and services, or investments. As noted by Les Clark[13]:

> *"There is no obvious rationale for the continuation of private access agreements, and there are other options for managing foreign fishing and foreign investment in the fisheries sector more generally through direct licensing of vessels without access agreements. Strengthening of developing country institutions related to fisheries management institutions is critical to taking up those options effectively".*

54. In terms of policy implementation gaps, this statement suggests that two particular sets of issues should be addressed:

- Developing countries should reassess domestic fisheries management and development needs of the fisheries sector while strengthening fisheries governance and associated institutions.

- Developed countries should reduce excess fleet capacity and subsidies associated with fleet operations; reassess the need for trade barriers for developing countries' value added products (tariff escalation); when negotiating fisheries access agreements, these should be "clean" of interference from other policy domains; provide development assistance and capacity building.

55. As both developed and developing countries take appropriate action, the need for traditional fisheries access agreements will diminish and be replaced with other types of arrangements, in particular joint venture agreements and direct investments (foreign and local). There is evidence that such

12 "Policy Coherence and Fisheries: From Crises to Recovery, A Synthesis of the Workshop Deliberations" by Robert Picciotto in *Fishing for Coherence* (OECD 2006)

13 "Perspectives on Fisheries Access Agreements: Developing Country Views", in *Fishing for Coherence* (OECD 2006)

developments are taking place already as some companies are setting up affiliate harvesting companies in developing countries (*e.g*. Pescanova; Austevoll Seafood; Pacific Andes). However, globalisation through direct foreign investments presumably takes place only where the investment climate is positive and where there are rights based fisheries that ensure some sustainability of operations, making this area an existing policy gap.

Domestic Fisheries Management Settings

56. National fisheries management regimes are the cornerstone for fishers' income generation and ability to adjust in a flexible way to the changing market situation created by global markets. Fish prices are constantly under pressure from competing food items, from greater availability of imported fish and fish products and from aquaculture. Fisheries management settings can determine how many fishers have access to a given resource, the way that access is shared (quotas, fishing days, effort) and how fishing takes place. As fish prices are largely exogenous to the individual fisher (the fisher most often is a price taker either through fish auctions or through contract landings), management settings will influence the costs of fishing operations and how benefits are shared. Furthermore, available evidence suggests that investors in the harvesting sector are likely to withhold investments when secure and enforceable user rights are not present.

57. Earlier work of the Committee (in particular, *Using Market Mechanisms to Manage Fisheries*) has highlighted the usefulness in leaving fishers room for manoeuvre in planning their fisheries operations. One of the key findings highlighted:

> *"The way in which different market-like instruments bundle together helps to determine the outcomes for the fisheries sector. In reviewing the experience of OECD countries, the study found that some instruments (such as individual quotas for effort and catches) are directed towards maximising the economic efficiency of resource use, while others (such as community catch quotas and some type of vessels catch limits) will allow fisheries to more readily adapt to short-term economic and natural fluctuations. Yet others (such as individual transferable quotas) are especially beneficial in facilitating long-term adjustment with respect to investment and capacity."*

58. For these reasons, Governments, when considering fisheries management reform, should work towards rights based management systems. In terms of globalisation, a key implementation gap for many OECD and non-OECD countries is to revisit their domestic fisheries management arrangements with a view to better responding to the opportunities of globalisation. Increasing availability of food at lower prices is a clear opportunity for consumers and, more generally, for the economy at large. However, if the fisheries management arrangement is rigid, fishers are likely to be losing out, inter alia, through lower incomes.

High seas governance

59. A particular problem highlighted above, relates to the governance of high seas resources. Fleet overcapacity spill-over to the high seas can have catastrophic consequences for fish stocks unless these are managed appropriately. While high seas fisheries do not represent more than an estimated 11% of total fisheries, these resources are particularly difficult to manage as they are under shared management responsibility of several countries, resources are often highly migratory (e.g. tuna) or have "difficult" characteristics (i.e. long lived, late maturing and reproducing e.g. Patagonian Toothfish) and are less tractable in terms of scientific knowledge (FAO, 2004).

60. Regional fisheries management organisations (RFMOs or similar arrangements) have been adopted as the appropriate means through which States cooperate to achieve and enforce conservation objectives on the high seas. Where no RFMO exists for an existing or emerging fishery, States must cooperate to establish one. In this regard, as highlighted by Michael Lodge[14]:

> *"In summary, as far as the right to fish on the high seas is concerned, the following conclusions may be stated with some confidence:*
>
> - *The duty to cooperate inherent in the LOS Convention applies equally to members and non-members of RFMOs*
> - *The duty to cooperate persists even where members of RFMOs fail to agree: there should be no unilateral action.*
> - *Non-members which do not agree to apply RFMO measures are "not discharged" from the duty to cooperate.*
> - *Where no RFMO exists, States are under an obligation to cooperate to establish an RFMO or apply appropriate (precautionary) conservation measures."*

61. However, the system of regional fisheries management organisations has proven to have difficulties stemming from various pressures internal and external to the organisation itself. As cooperative behaviour among members and non-members is crucial for the success of those management arrangements, the allocation mechanism for high seas resources plays a particularly important role in ensuring stability. This has, however, been undermined by a lack of cooperation, free riding and IUU fishing, by both members and non-members of the organisations. In this regard the RFMOs need to consider new approaches to the management and sharing of resources. In the meantime, as highlighted by Michael Lodge: *"This requires that they are empowered to consider the use of a wide range of mechanisms for achieving acceptable economic benefits to all parties from cooperation and compliance, including access arrangements, quota trading and leasing."*

62. It would therefore appear that a major policy implementation gap for the management of high seas fisheries is to effectively deal with the allocation mechanisms of RFMOs, further develop policies towards IUU fishing (as there are likely to always be cheaters among members and non-members alike) and effectively deal with excess fishing capacity and spill-over possibilities to the high seas. In addition, a remaining specific policy gap is the effective participation of developing countries in high seas arrangements.

63. A number of actions can be taken at the national/supra national level to at least stem the IUU fishing problem. Measures include better surveillance, use of catch and trade documentation, augmented port controls and increased international cooperation among fisheries agencies fighting IUU activities. In this regards, operators along the value chain also have a vested interest in seeing the IUU fisheries curtailed as their image can easily be tainted in a global market place.

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[14] Michael Lodge: "Are present international high seas governance structures sufficient to reap the benefits of globalisation". In *Globalisation and Fisheries: Proceedings of an OECD-FAO Workshop* (forthcoming).

GLOBALISATION IN THE AQUACULTURE SECTOR

Companies in the aquaculture sector have pursued a globalisation strategy based on foreign direct investment in aquaculture installations abroad or through fragmenting parts of the farming processes to other companies. Production and transport costs in salmon farming differ considerably across producing countries due to labour costs and distance to markets. Concentration is occurring in the aquaculture sector, both in production and in companies providing inputs, particularly in the feed compound business. Access to raw material (fish for reduction to meal and oil) is a key consideration in this respect. A key policy implementation issue is the implementation of sustainable and responsible aquaculture practices in producing countries.

Globalisation of the Aquaculture Sector

64. The farming of fish is an ancient activity that has gradually developed from a subsistence activity to a large scale commercial activity. Aquaculture or the farming of aquatic organisms includes fish, crustaceans and plants; human intervention ranges from the addition of feed to stocking and protection from predators. A wide range of species are farmed; global aquaculture production reached 59,4 million tons in 2004 with an associated value estimated to be USD 70 billion. Summary characteristics of world aquaculture are provided in Tables 2-4.

Table 1. Aquaculture Production in Inland and Marine Waters, 2004

	Quantity (million tons)		Value (USD billion)		Total production	
	Inland	Marine	Inland	Marine	Quantity	Value
Fish, crustaceans and molluscs	27.2	18.3	34.5	28.9	45.5	63.4
Plants	-	13.9	-	6.8	13.9	6.8
Total	27.2	32.2	34.5	35.7	59.4	70.2

Source: FAO Yearbook

Table 2. World Aquaculture Production by Main Species Group, 2004

	Quantity (million tons)	Value (billion USD)
Freshwater fish	23.9	24.6
Diadromous fish	2.9	8.3
Marine Fish	1.4	4.9
Crustaceans	3.7	14.4
Molluscs	13.2	9.8
Plants	13.9	6.8

Source: FAO Yearbook

Table 3. Farmed Species with a Value Above USD 1 billion, 2004

	Quantity (million tons)	Value (USD billion)
Oysters	4.4	2.7
Silver carp	4.0	3.3
Grass carp	3.9	3.1
Common carp	3.4	3.2
Manila clam	2.9	2.2
Bighead carp	2.1	1.8
Crusian carp	1.9	1.4
Nile tilapia	1.5	1.6
White shrimp	1.3	4.9
Atlantic salmon	1.2	4.1
Yesso scallop	1.1	1.4
Tiger prawn	0.7	3.3
Chinese mitten crab	0.4	2.1
Rainbow trout	0.5	1.7

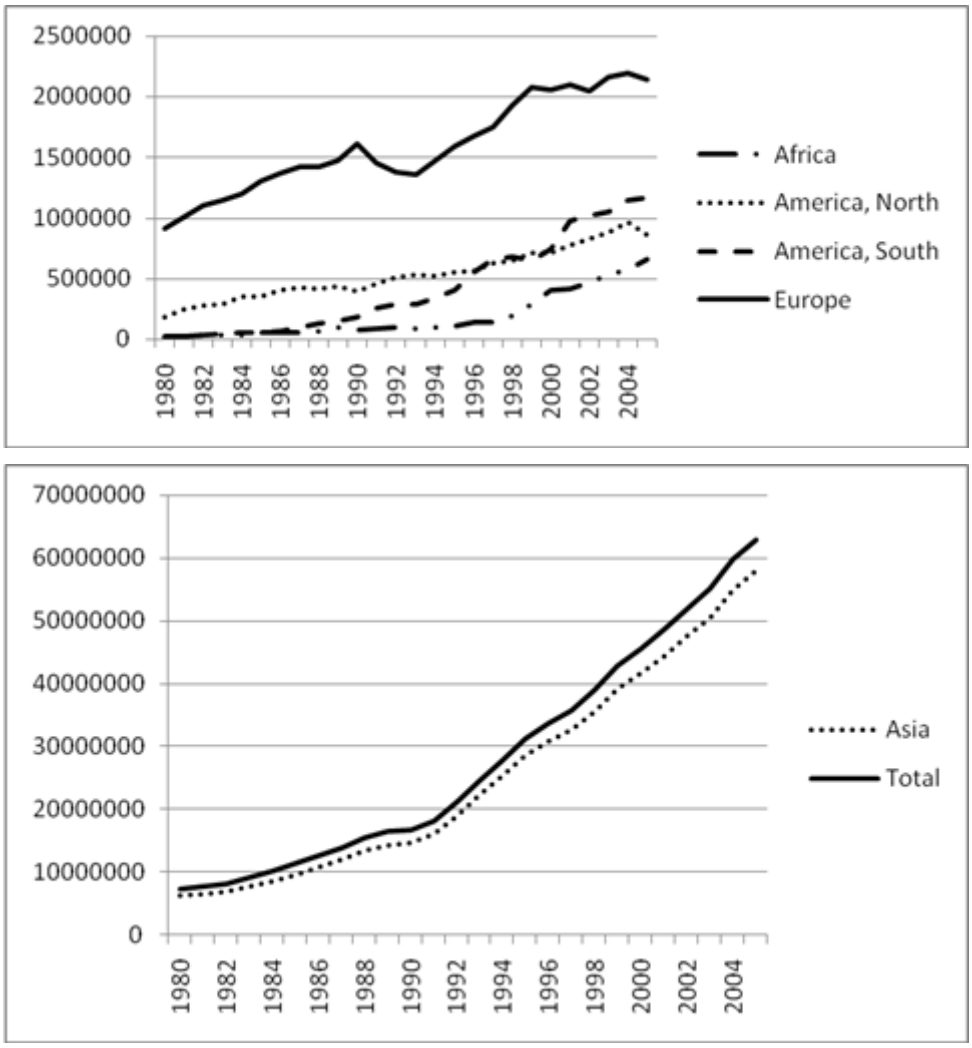
Source: FAO

65. There are basically two types of aquaculture: artisanal and commercial. Most aquaculture in the developing world is of artisanal nature producing for local consumption only; it is by far the most important part of overall aquaculture production and the most important species involved are various types of freshwater carps. Aquaculture for international markets is different as it is subject to stringent sanitary and hygiene rules to be able to enter those markets. The species are also of higher value with a ready consumer appeal; species include shrimps, oysters, mussels, salmon, sea bass and bream, rainbow trout, eels and turbot. More recently, new species being farmed for commercial scale include cod and tilapia and in the not too distant future, tuna.

66. Aquaculture production has a number of distinct advantages over wild harvested species. Farmers can provide a more regular flow of products with more regular quality (size, colour etc.) and farming takes place in controlled conditions (knowledge about what the fish has eaten, quality of aquatic environment, etc.). These are very important considerations for retailers in their marketing strategies. It is therefore important for the retailers that the consumer's image of aquaculture is not tainted but is based on reliable and verifiable sources of information.

67. Farming in developed countries is generally capital intensive and relatively concentrated; in developing countries, in contrast, farming is mostly small scale and extensive. Species differ as well; finfish (salmon, bream, and sea bass), oysters and mussels are predominant in developed countries while carp, shrimps and tilapia are a mainstay for developing countries. There is no doubt that aquaculture will continue to be important for the fisheries markets as wild caught fish becomes more difficult to get in line with continued overfishing.

Figure 10. Aquaculture Production 1980-2005 by Region, tonnes



Source: FIGIS

68. Asia as a region is by far the most important aquaculture producer, with China being the single most important country. World aquaculture production in 2005 was 59.4 million tonnes, 70% of which takes place in China. 91% of total world production by value comes from Asia with 80% of total world production from China. The combined figures for North and South America plus Europe are 7% by quantity and 17% by value.

Internationalisation of Aquaculture Production

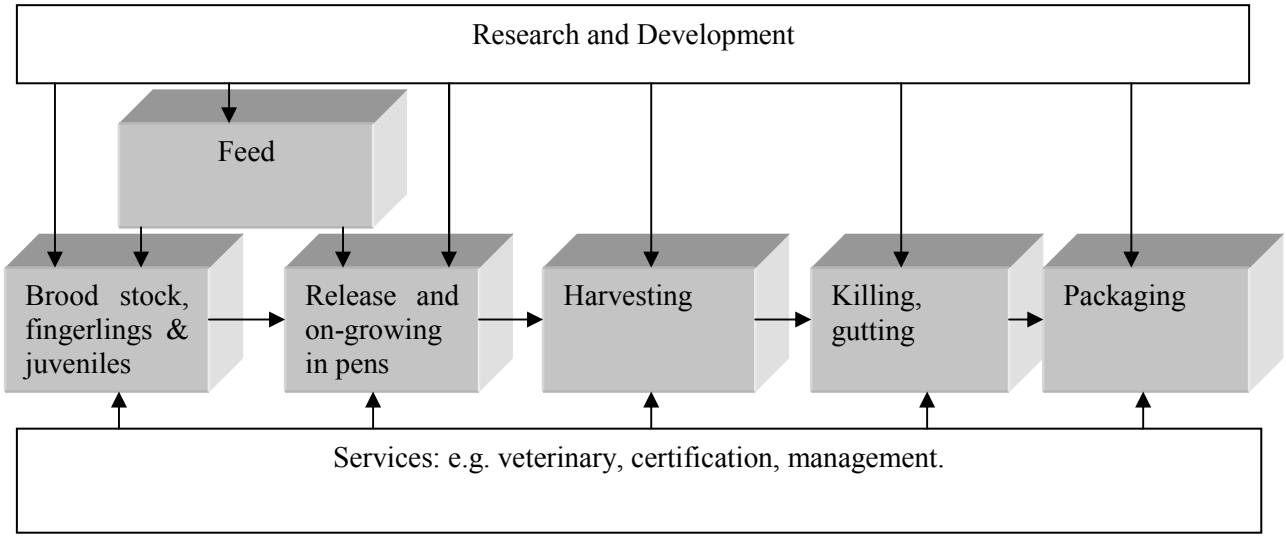
69. Aquaculture production has globalised in at least two ways; through foreign direct investments (directly by setting up aquaculture installation, or through the purchase of production companies) and through sub contracting parts of the aquaculture process to other companies (fragmentation and outsourcing).

70. Available evidence from the 30 largest companies involved in fisheries and aquaculture suggests that there is substantial foreign direct investment in the sector. Marine Harvest of Norway produces salmon in Norway, Chile, Canada, Scotland, Ireland and the Faroe Islands and has other farming interests

(yellowtail) in Asia. Cermaq of Norway has farming interests in Chile, Canada, Scotland and Norway primarily involved in salmon (mainly through acquisition of existing farm facilities). Leroy Seafood Group of Norway has salmon production facilities in Norway and Scotland. Nireus of Greece operates sea bream and bass operations in Greece, Turkey and Spain and has interests in other aquaculture companies in Norway, especially Marine Harvest. In the Asian region, Nippon Suisan Kaisha of Japan has salmon aquaculture installations in Chile, eel farming in China, as well as farm installations in Indonesia. Maruha, also of Japan, owns aquaculture subsidiaries in Spain (tuna farming) and Madagascar (shrimp culture).

71. In aquaculture there is also room for fragmentation and hence possibilities for outsourcing; generally "aquaculture" consists of research; production of brood stock and juveniles which is a high technological venture requiring particular technical skills; on-growth; harvesting and initial processing (gutting, packaging). When new species are being reared this often takes place in publicly funded research laboratories. Hatcheries are often smaller units specialising in juvenile-stages and initial growth to sizes appropriate for release into on-growing/fattening aquaculture installations. Generally, production in aquaculture follows a process as given in Figure 11.

Figure 11. Schematic Aquaculture Production System



Source: OECD and personal communication with FAO staff.

72. In the meantime, an analysis of the major companies involved in salmon, sea bream, bass and eel farming reveals that companies that are fully integrated with processing and sales have surprisingly little outsourcing. This may possibly be explained by the sheer size of such companies: integrating processing, sales and farming results in full control of the supply side, often resulting in better management of risks. It is also noted in this respect that, at least in salmon farming, there is a high degree of concentration. The ten largest salmon producers are responsible for 60% of world supplies. Some industry leaders expect this to increase to 90% over the next decade. Nevertheless, in salmon farming, it still seems that the production of brood stock and fingerlings is largely an input from outside specialised companies.

73. A guiding principle in aquaculture management is that the time lag (and hence distance and possibilities for fragmenting into segments that can be outsourced) between two segments has to be as short as possible because of time constraint (fish stress management, freshness, minimize food safety concerns). This may also explain why outsourcing of parts of the farming process is rare.

Box 8. Marine Farms

Marine Farms is an international aquaculture company with a diversified and integrated seafood portfolio. The Company's current product portfolio can be divided into three main categories:

- Salmon and salmon eggs, parr and smolt and salmon produced in the UK trough the wholly owned subsidiary Lakeland are primarily sold to the UK and French markets through wholly owned Sea Products of Scotland

- Seabass and seabream (and juveniles) produced in Spain and sold to the domestic market through the wholly owned subsidiary Culmarex

- New species represented by cobia and cod, initially producing and selling juveniles to other farmers. The on-growing of cobia for sale commenced this year in Belize and Vietnam.

Source: http://www.marinefarms.no/content/view/64/36/

Box 9. Forward Integration

Norway Royal Salmon is a sales organization owned by and representing a number of salmon farmers in Norway. The main objective of the NRS is to organize sales and marketing of salmon from its member companies and improve the quality of production. The NRS operates hatcheries, on-growing farms, slaughtering and packing plants and plants for value added production.

Source: http://www.norwayroyalsalmon.com/

74. As for production costs in the salmon industry, calculations by Cermaq (October 2005) suggest that Chile has a competitive advantage. Their figures suggest the following costs of production:

Chile: NOK 9.90/kg product,
Norway: NOK 14.40/kg,
Canada: NOK 15.90/kg, and
Scotland: NOK 19.50/kg.

75. Transport costs are an important element for fresh fish; less so for frozen. Also, according to Cermaq freight costs of salmon are an important element in their location decisions. The following table (October 2005) provides costs of freight between main producing and consuming regions.

Table 4. Costs of Freight Between Main Producing and Consuming Regions

	Fresh (NOK/kg)	Frozen (NOK/kg)
From Norway to USA	15	2
From Chile to USA	12	2
From Canada to USA	1.50	1.50
From Norway to Europe	3	2
From Chile to Europe	15	2

Source: Cermaq

76. Such differences in production and transport costs are important elements influencing investor decisions regarding production sites. Combined with the limits that the Norwegian authorities have imposed on the maximum number of licences and production any given aquaculture company may hold in Norway, production and transport costs have been the principal elements in the decision for Norwegian operators to buy up farms in Chile and Canada.

Box 10. Grieg Seafood

Grieg Seafood, a Norwegian company involved in aquaculture, has operations in Canada which has expanded considerably during recent years. The last acquisition was made in February 2007 when the Group bought Target Aquaculture including 8 production licenses and one processing plant. The Group has made considerable investments to modernize the equipment in Canada the last years, among other factors to meet environmental challenges. The Canada operation has a crucial proximity to the American market. Transport costs are NOK 6-10 lower per kg than for our Chilean competitors. Furthermore, the temperature conditions (between 7-15 degrees) in the sea off Vancouver Island are ideal for salmon farming.

Source: http://www.griegseafood.no

Aquaculture and Policy Implementation Gaps

77. As noted above, aquaculture has made an important contribution to the fisheries sector in particular over the past two decades as farming techniques have been mastered to include salmon, shrimps, sea bass and sea bream as well as the fattening of eels and tuna. These techniques have spread at a fast rate over the world; salmon and trout farming takes place on all continents; tuna fattening has been taken up in the Mediterranean and Australia etc. showing that such techniques are replicable and provide increased economic opportunities. Companies have extended their business operations abroad, farming in several countries to benefit from location, availability of space, production licences, easier access to raw material (feed and fish stocks), labour costs and proximity to markets (transport costs).

78. In developing countries, aquaculture is mostly made up of small-scale family holdings that supply the domestic market and produce fish and crustaceans for exports. Small-scale producers in developing countries need finance, capacity-building and technology transfer to be able to meet the requirements of the export markets. Domestic action, including through the establishment of cooperatives and "clustering", can enhance small scale farmers' ability to participate in the global value chain.

79. There are several areas in the aquaculture industry where the public and private sector intersects; these include government financial assistance, the development of new species and more generally environmental friendly aquaculture, feed compounds, use of space, markets and market access, governance of the industry, food safety and animal health and research. The following will briefly highlight certain important policy implementation gaps that the preceding analysis has contributed to uncover.

Sustainable and responsible aquaculture: the importance of national aquaculture plans that can guide the development of the industry

80. In OECD countries, the key challenge for policy makers is to ensure that aquaculture can fulfil its potential despite higher production costs and issues such as competition for ocean space and reputation, while concurrently minimising the externalities of aquaculture production. Hence, policy makers in all states need to articulate and develop aquaculture strategies and action plans to ensure sustainable production, market acceptance and the ability for products to enter into trade.

81. Also in aquaculture, sustainability and responsibility is a "*sine qua non*". The image of aquaculture is constantly under pressure including for the negative effects on the environment, for the use of medicines, hormones and genetics. Good farming practices are therefore important to introduce and verify either as part of a government policy or through verification/certification schemes.

82. Most countries heavily engaged in aquaculture have developed national plans; this has been underpinned by the work of the FAO in developing the Code of Conduct for Responsible Fisheries which includes a section dealing with aquaculture. Aquaculture in that context is seen as a means to promote

diversification of income and diet. The Code furthermore calls for States to "establish, maintain and develop appropriate legal and administrative framework which facilitates the development of responsible aquaculture."

83. The FAO maintains an inventory[15] of national aquaculture legislation. An overview of the inventories across the OECD membership suggests that a number of OECD countries have not yet developed national aquaculture plans[16]. As these aquaculture plans do have a direct impact on the way the aquaculture industry globalises as well as an impact on the costs of domestic production, it would seem that more effort should be invested into setting up appropriate legislation for the sector and ensuring appropriate implementation.

84. In terms of the pathways for globalisation in aquaculture the above overview has shown how farming companies go global. This is likely to be closely linked to the number of production licenses any given company is allowed to hold and the associated production volume, production costs and costs for delivering to markets. The national legislation regarding the distribution of licences and maximum amount of licences and/or production any given company may hold is central to understanding the globalisation in salmon aquaculture. The review of the companies engaged in salmon aquaculture suggests that the globalisation path nowadays is through acquisitions of companies abroad, rather than as directly investing in start-ups. Traditionally, there has been an important link between salmon farming companies and producers of fish feeds; although most fish feeding companies still own some fish farming interests it is less today than previously.

Industry ownership structure

85. While industry ownership structure is generally not an issue in fisheries and aquaculture, two important exceptions stand out: salmon farming and production of feed compounds for aquaculture. Industry information suggest that the ten largest salmon producers in the world account for roughly 64% of world output of farmed salmon; some industry leaders predict that to increase to 90% over the next decade. According to one company source (Grieg Seafood[17]) salmon production in 2006 amounted to (of a world production of 1 269 000 tons) distributed among the following ten largest producers as follows:

- 338 000 tons from Marine Harvest (27%)
- 104 000 tons Cermaq (8.2%)
- 81 000 tons Aquachile (6.4%)
- 75 000 tons Leroy (6%)
- 42 000 tons Salmar (3.3%)
- 38 000 tons Pesquera a Camanchaca (3%)
- 36 000 tons Pesquera Los Fiordos (2.8%)
- 33 000 tons Grieg Seafood (2.6%)
- 32 000 tons Salmones Antaertica (2.5%)
- 31 000 tons Salmon Multiexport (2.4%).

15 http://www.fao.org/fi/website/FIRetrieveAction.do?dom=collection&xml=nalo.xml

16 Countries that have submitted a plan are Australia, Canada, Denmark, France, Germany, Ireland, Italy, United Kingdom, Japan, Mexico, New Zealand, Norway and United States. Among the observers to the Committee Thailand has submitted a plan.

17 http://www.griegseafood.no/docs/070607_GSF_Investor_presentation.pdf

86. As for feed compounds, of the 2 925 000 tons[18] of feed compounds produced in 2006 approximately 925 000 tons was produced by Skretting (a Nutreco company previously engaged in fish farming as well through Marine Harvest, but now disinvested), 700 000 tons by EWOS (part of Cermaq, see above) and 500 000 tons by BioMar (BioMar is involved in salmon farming through a Norwegian company Sjotroll) *i.e.* 73 % of the world output used by aquaculture producers are produced by three companies (which are also involved in aquaculture themselves).

87. In terms of policy actions, such concentrations may require public authorities to monitor on a more regular basis the developments in these two markets for their potential adverse market impact such a concentration could potentially give rise to. Several antidumping actions or investigations on salmon have occurred over the years. These have concerned the salmon producers of Norway, Chile and the Faroe Islands with the major markets in the EU and USA being the investigators. It should be added that one of the reasons for the relative high concentration in salmon production may have been caused by a decision by Norway to limit domestic production (feed quotas and licences). The only possibility to further company development would be through buying up companies or investing abroad (which also explains the many Norwegian companies with interests in Chile). Hence, in terms of globalisation, this also underlines the importance of establishing a solid and forward looking domestic aquaculture legal framework.

88. In the United Kingdom the mergers and acquisition among salmon and feed producers has been the subject of numerous referral to the UK Competition Commission[19]. These investigations have included companies involved in both salmon production and in feed compounds. If the salmon industry becomes even more concentrated in the future, such investigations may become more regular. Similarly, other countries that have particular important interest in the salmon farming and feed compound production industry may wish to start reflecting on how the changing markets structure may impact on competition.

The dependence on fish in feed compounds: the fishmeal trap

89. The aquaculture industry is heavily dependent on the production of fishmeal and oil and is in competition with other major users *i.e.* pigs and hogs. The International Fishmeal and Fish Oil Organisation (IFFO) and the Fishmeal Information Network (FIN)[20] estimate that by 2010 the aquaculture industry will use 50% of the world's fishmeal output and 88% of the fish oil. This means that unless alternatives are being found prices of feed (which is an important component of production, in particular in salmon, sea bass, bream and turbot farming) will increase and may become a major constraint for further growth globally (see Box 11). To meet future global demand and protein needs of the global market, investments in alternatives to fish meal and oil, and into the development of alternative non-carnivorous species with market appeal is needed. In view of the growing dependence on the aquaculture sector across the fisheries market this may be a shared problem that needs cooperative approaches across countries. Assuming that farmed production of carnivorous species continue to grow, it will become increasingly important that aquaculture producers link up with feed processors.

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18 Information from Cermaq posted at http://hugin.info/134455/R/1030396/165276.pdf

19 See for example <www.competition-commission.org.uk/rep_pub/reports/2000/nutreco1.htm> dealing respectively with proposed acquisition by Marine Harvest Scotland Ltd (MH), a subsidiary of Nutreco Holding NV (Nutreco), of Hydro Seafood GSP Ltd (GSP) from Norsk Hydro ASA (Norsk Hydro) or <www.competition-commission.org.uk/rep_pub/reports/2006/fulltext/520.pdf> (final report on the "Pan Fish and Marine Harvest NV Merger Inquiry").

20 See <www.iffo.net/ and http://www.gafta.com/fin/fin.html>

Box 11. Aquaculture feed

Feed accounts for 35-60% of the cost of farmed salmon production, half of which is from the protein component. Future feed costs are expected to increase significantly unless the cost of that protein component can be reduced. Fish meal makes up roughly 30-50% of the protein component of fish feed, thus, finding cheaper, but equally palatable and digestible alternatives to fish meal would significantly reduce one of the major costs of salmon aquaculture production.

Source: http://www.dfo-mpo.gc.ca/science/aquaculture/biotech/fact3_e.htm

Environmental Issues and Pollution from Aquaculture: Dealing with the Image of Fish Farming

90. There are certain environmental effects that aquaculture potentially can cause. Chief among these are:

- The release of nitrogen/phosphor though faeces and feed not eaten by fish can cause nutrient enrichment and hence eutrophication.
- The use of wild caught stocking material can have significant impacts on wild stocks (e.g. tuna and eel).
- Escapees from farms may intermingle with wild stocks or invade areas as non-indigenous species. This may have biodiversity impacts and cause changes in genetic diversity.

91. Such issues need to be addressed in a coherent way to help underpin the image that fish farmers wish to project to the public i.e. that the industry is sound and well managed and can contribute substantially to overall food-fish production. In this regard, it is important to identify the respective roles of governments versus producers in terms of addressing such issues. It also highlights the importance of a sustainable aquaculture planning framework. The institutionalisation of a domestic dialogue between producers, public authorities, consumer interests and environmental NGOs may be a particular useful way forward; appropriate solutions may also help to expand sales from aquaculture abroad.

92. Consideration of environmental issues in aquaculture is a particular challenge for developing countries and may be linked to gaining (or retaining) market access in developed markets - and to the benefits of globalisation. Certification systems flourish and could be used to limit access to markets. Developed countries should in this regard consider providing development assistance and knowledge transfer. The case of the Swiss SIPPO (Swiss Import Promotion Programme) assisting several developing countries move to organic production (in particular of shrimps) is an example of how such transfer of knowledge may take place.

Particular Challenges and Opportunities for Developing Countries

93. Most production in aquaculture in developing countries is fragmented in fairly small family holdings. From this observation at least four issues arise that will help articulate a strategy to benefit from global aquaculture markets:

- A need to build cooperative marketing centres that can take in produce from the small scale holdings and provide essential marketing services.
- A need to identify and develop appropriate finance mechanisms as most commercial banks will not lend money to small scale producers.
- Improved access to technical extension/help to improve farming.
- Improved transport and cold storage facilities.

94. Several case studies presented to the OECD/FAO Workshop on Opportunities and Challenges of Fisheries Globalisation provided evidence on various ways to overcoming or addressing such shortcoming in developing countries. In India for example shrimp farming is an important industry with growing exports to OECD countries. However, 90% of the shrimp farms are of less than 2 hectares, *i.e.* small scale and marginal farmers. Concurrently, since 2000, the farm gate price for shrimps has been constantly falling due to global increases in production and certain marketing difficulties (*e.g.* US antidumping actions). This may require a different approach to the institutional and governance structures.

95. In particular, individual small scale farmers do not have any bargaining power and many will not have the necessary installations to provide a product that is acceptable to the international market. Pooling their efforts, through clustering of small scale farmers and the establishment of cooperatives has been successful and may provide and answer to future developments in developing countries. Also, as the global markets for aquaculture products grow and the requirements for environmental quality control, health and hygiene become more stringent developing countries need to reassess the role and objectives of their aquaculture sector. While social objectives may be prevalent in today's farming strategy in developing countries, as competition becomes fiercer and prices decrease, more emphasis on large scale industrialisation may be warranted.

96. Availability of finance to small-scale farmers can be an important impediment to further growth in the aquaculture sector of developing countries and hence on their ability to benefit from globalisation. Microfinance institutions are better equipped to addressing the interests of small scale farmers and their development should be encouraged. Guidelines to this effect have already been published by the FAO[21].

97. NACA (the Network of Aquaculture Centres in Asia-Pacific)[22] is a cooperative effort of a number of countries to share and mutually inform each other of aquaculture research and activities. NACA, an intergovernmental organisation, promotes rural development through sustainable aquaculture, improve rural income, increase food production and foreign exchange earnings and to diversify farm production. NACA's activities include: Capacity building through education and training; Collaborative research across the membership; Information and communication networks; Policy guidelines and support to institutional capacities; Aquatic animal health and disease management; and Genetics and biodiversity. NACA has several partners in the donor community and among the specialised international agencies dealing with development or aquaculture.

98. Such centres could have equally positive effects in other parts of the world, in particular in Africa and South America and should be encouraged to be established.

99. Establishing speciality markets (e.g. organic shrimp aquaculture) may provide for a new orientation and strategy for further growth. One example presented to the Workshop (the Swiss Import Promotion Programme) provides assistance to farmers in developing countries to convert into the organic farming segment products from which are readily acceptable in OECD countries at premium prices. This segment is foreseen to have substantial future growth, particularly as consumers in developing countries are increasingly oriented towards health concerns.

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21 U. Tietze and L.V. Villareal "Microfinance in fisheries and aquaculture: guidelines and case studies", FAO Fisheries Technical Paper No. 440. Rome, FAO. 2003.

22 http://www.enaca.org/modules/tinyd1/

GLOBALISATION IN THE FISH PROCESSING SECTOR

Major fish processing companies are pursuing two parallel strategies. On the one hand, in order to secure access to raw material fish processing companies integrate backwards into harvesting and aquaculture (through acquisitions or establishment of subsidiaries). On the other hand, processors also integrate forwards in the value chain through sales and branding in order to establish bargaining power in light of increasing concentration in the retail sector. Restrictions on market access (through tariffs for developed countries and sanitary/hygiene issue in particular for developing countries) and investment climates that encourage foreign direct investment are areas where policy gaps still remain.

Globalisation of the Fish Processing Sector

100. Fish is a very versatile commodity and there are many ways to process fish. Processing fish may initially involve preserving the fish in order to retain its shelf life until transport to market (such as primary processing into frozen fillets as distinct to secondary processing which is more elaborate). Technological developments in fish processing have contributed to globalisation by extending the shelf-life of fish, allowing it to be traded over greater distances and lengthening supply chains (Table 5). A number of techniques are used, such as temperature control (using ice, refrigeration or freezing), or through curing (drying, salting, smoking and freeze-drying). In 2004, 61% (86 million tonnes) of the world's fishery production was processed (FAO, 2007).

101. Globalisation in the processing sector takes place along three principal paths; 1) through outsourcing of production processes to outside companies; 2) through the expansion of a company's base (setting up companies abroad, acquisitions etc); and 3) through global sourcing of raw material. Globalisation is the outcome of the search by processors for stability and security in raw material supply and quality, while simultaneously seeking opportunities to reduce costs in an industry characterised by high competition.

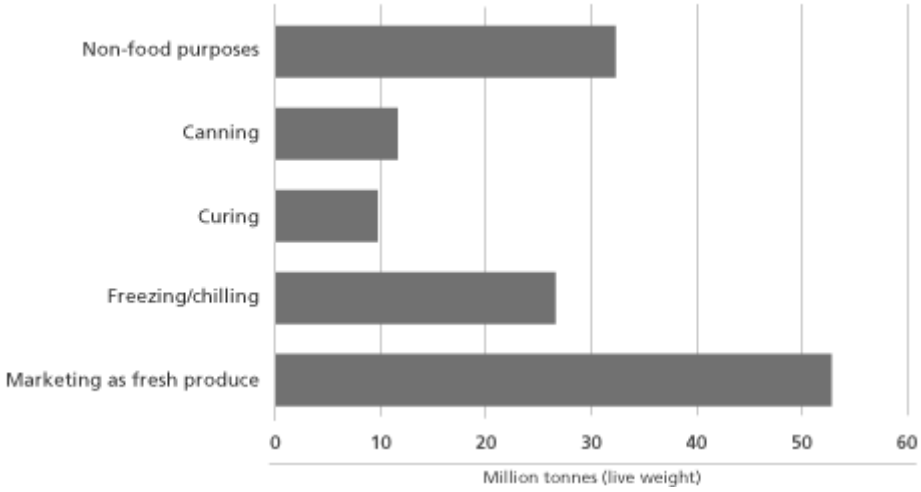
Table 5. Technological Developments in the Fish Processing Sector

Era	Technological Development
Pre-middle ages	Drying, salting, smoking
Pre-industrialisation (13th century – mid-19th century)	Salting, drying, canning
Initial industrialization (Late 19th century – WWII)	Refrigeration, freezing
Expanded industrialisation (WWII – 1980)	On-board freezing and processing, fish pastes
Intense globalisation (since 1980)	Further value addition and vacuum packaging

Source: OECD Secretariat

102. As shown in Figure 12, freezing remains the main method of processing fish for food use, accounting for 53% of total processed fish for human consumption in 2004, followed by canning (24%) and curing (23%) (FAO 2007).

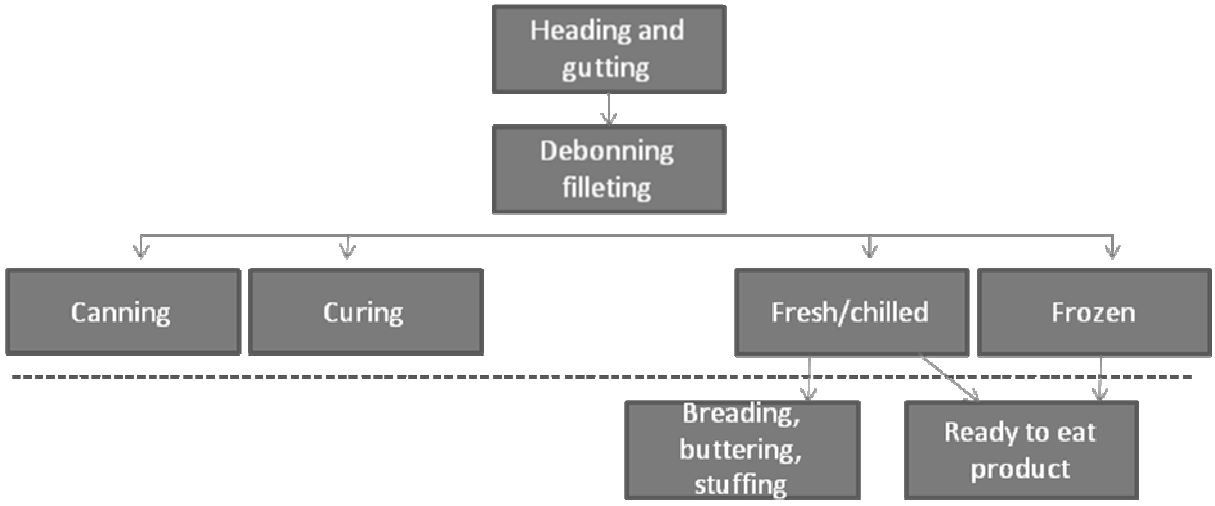
Figure 12. Utilisation of World Fisheries Production



Source, FAO, 2004

103. Incresaing demand for fish products that are ready to eat or require little preparation before serving has created further opportunities for the creation of value addition in the processing sector. Figure 13 demonstrates the typical processing a fish such as groundfish may undergo. Processes below the dotted line indicate where significant value has been added.

Figure 13. Processing Opportunities for Groundfish



Source: OECD

104. Companies may choose to undertake primary and/or secondary processing in a different location to final markets or to the location of raw material procurement. Raw material can come from either domestic or international sources and initial processing can take place in the same country as supply or in a third country. Secondary processing may also take place in the same location as primary processing, or in a

third country, before the finished product is sold in the domestic market or internationally. This 'slicing of the value chain' or fragmentation of the value chain, is decided by fish processors based on relative costs of production at different locations, trade barriers, quality differences, transport costs and technological ability.

105. To establish the extent to which fragmentation occurs in the processing sector, Table 6 examines the ten largest processing companies (by market capitalisation) and their sourcing and processing locations. The table shows that five of the ten largest processors locate their processing plants close to available raw material. Those companies in the table that source globally are those with fishing vessels who own fishing quotas.

Table 6. Ten Largest Companies in the Fishing Industry

Company	Country of Company Headquarters/principal stock listing	Sourcing locations	Processing locations	Type of processing undertaken	Key products
Marine Harvest ASA	Norway	Faroes, Ireland, Asia, Norway. Chile, Scotland, Canada	Norway, Belgium, France, The Netherlands, Poland, Chile, Scotland, Canada,	Filets, coated, smoked, ready-to-eat meals, finger food	Salmon, some whitefish
Nippon Suisan Kaisha Ltd	Japan	China, Chile, Indonesia,	The Netherlands, Spain, Denmark, Chile, Alaska	Fresh, frozen, fish paste, canned, fish sausage, fine chemical extracts	Wide range of marine products, fine chemical products
Cermaq ASA	Norway	Norway, Chile, Canada, Scotland	Chile, Norway, Peru	Fish meal and oil/feed compounds	Salmonids and salmonid feed
Austevoll Seafood	Norway	Chile, Norway, Peru	Chile, Norway, Peru	Fish oil, canned, frozen	Pelagic fish, salmon, industrial fishing
China Fishery Group Ltd	Cayman Islands	Global Procurement	Peru, on-board processing	Freezing	Frozen raw material
Leroy Seafood Group ASA	Norway	Norway	Norway, France, Sweden, Northern Europe	Fresh, frozen, in brine	Salmon, whitefish, pelagic fish, shellfish, trout
Maruha Corp	Japan	Global Procurement	North America, China, South East Asia	Frozen, shelled (shrimp), sliced, canned, freeze-dried foods, health foods	Wide range of marine products
Thai Union Frozen Foods Group	Thailand	Imports	Thailand	Canned, frozen, brine, seasoning, breaded, peeled (shrimp), finger foods, ready-to-eat	Tuna, salmon, sardine, mackerel, finger-food, shrimp, cephalopod, pet food

Table 6. (cont.) Ten Largest Companies in the Fishing industry

Company	Country of Company Headquarters/principal stock listing	Sourcing locations	Processing locations	Type of processing undertaken	Key products
Pescanova S.A.	Spain	Global Procurement	Chile, Namibia, Argentina, Spain	Frozen, breaded, battered, ready-to-eat, pre-cooked	Atlantic Salmon, Chilean sea Bass, Hake, Kingklip Filets, Orange Roughy, Stone Crabs
Connor Bros Income Fund	Canada	Global Procurement	Canada	Canned, ready-to-eat	Canned sardines, herring, tuna, (plus crab, lobster, clams, mussels, oysters, shrimp in ready-to-eat meals)

Source: OECD, based on company web sites.

106. Table 6 also shows that the largest processors come from countries that have traditionally been dominant fishing nations. Historically, large catches required large processing facilities, which brought wealth and growth to local processors. However, these processors are hardly local processors anymore and the majority of large processors both source and process in several locations.

107. Some processing is labour-intensive and it may be profitable to undertake such processes in locations that have lower labour costs, such as China (Mölder 2007). 700 000-800 000 mt of frozen whitefish were processed in China in 2005 and it is estimated that China is currently producing around 30% of the world market supply of white fish fillets and fillet blocks (Mölder 2007) (Box 12).

Box 12. The Chinese reprocessing industry

China is a leading location for processing imported raw material for re-exports. From 2002-2004, more than USD 580 million of seafood products were exported on average annually from North America to China and more than USD 1.4 billion imported into North America from China. Much of that trade is unprocessed frozen fish products exported to China for further processing and re-importation to the US. It is estimated that 700- 800 ,000 tonnes of frozen whitefish (headed and gutted) were processed in China in 2005, including more than 500 000 MT of Alaska pollock, and 175 000 tonnes of cod.

The Chinese fish reprocessing is mainly low skilled, labour intensive and traditionally works on low margins, influencing all the traditional whitefish markets by being able to offer low cost fillets, portions and blocks for secondary processing in Europe and the US. It is estimated that China is currently producing about 30% of the world market supply of whitefish fillets and fillet blocks from Alaska pollock, cod, haddock and hoki (Groundfish Forum, 2006).

Table 7. World Market - Whitefish Blocks and Fillets from China 2005

	Blocks MT	Fillets MT
Alaska pollock	130 000	71 000
Pacific cod	17 000	24 000
Atlantic cod	19 000	20 000
Hoki	3 000	4 000
Haddock	3 000	7 000
Total	172 000	126 000

Source: Möller and Macfarlane, 2007.

In 2005, EU imports of double-frozen Alaska pollock products from China equaled imports of single-frozen products directly from the two chief producers, US and Russia. Imports of blocks and fillets produced at source were 91 000 MT from the US and 18,000 MT from Russia, while imports from China were recorded at 111 000 MT. In 2005, EU imports of frozen cod fillet products from China also equaled imports of single-frozen products directly from the two chief producers of Atlantic cod, i.e. Iceland and Norway. Imports of frozen fillets produced at source were 32 000 MT from Iceland and 16 000 MT from Norway, while imports from China were recorded at 47 000 MT. The products appear to compete in similar market segments chiefly in the UK, but the indications are that the Chinese products are mostly sold coated in retail packs, while the single-frozen products have a more varied presentation on the retail market, including the chilled market. Evidently, such a large influx of frozen products onto the EU market has impacted the primary producers of whitefish in the North Atlantic. They have reacted in different ways to the competition from China. Some are exporting raw material to China or reorient their production to producing more salt and dried fish, while others have increased fresh fillet production.

Source: Möller, 2007.

108. Alongside the pull of cheaper costs of production, outsourcing is likely to take place in countries that have a fast developing fishing industry that has the resources to ensure compliance with health and safety standards. OECD markets place a high premium on health and safety of food products in general and tolerance for health and safety risk is low and falling. Adoption of risk-based food safety management systems has opened up opportunities for seafood products processed in different countries to gain relatively easy access to markets (once processors have demonstrated compliance). Once assured about the safety and integrity of a product and processes (such as through certification of adherence to regulations,

HACCP) consumers buy without sensitivity to country origins. This is why the role of brands and supermarkets are so vital to establishing consumer trust and why supermarkets defend their reputations so fiercely. This lack of sensitivity to sourcing country means that once processors are export-approved, there are no market barriers (although economic barriers exist) for firms to outsource parts of production (Melgaard 2007).

Regulatory environment for processing

109. The regulatory environment in the seafood processing value chain element is primarily concerned with trade measures and seafood safety *e.g.* sanitary and hygiene standards. Continued access to foreign markets is a major factor for developing countries to increase and maintain their high performance in fish trade. Although trade barriers have been decreasing, tariff peaks and escalation - particularly for processed and value-added products - remain important. Hygiene and safety standards in the fisheries sector are generally seen as "non-negotiable" in OECD markets. However, high costs and lack of resources to implement safety standards by exporting countries are often cited as major obstacles, in particular for exporters in developing countries.

110. **Trade:** Many developing countries have export oriented supply chains that are reliant on high-value markets in developed countries. In recent years, considerable progress has been made in lowering and removing barriers to trade such as tariffs and quantitative restrictions, in particular among OECD countries that are facing increasing difficulties sourcing from their own waters. Tariff barriers still exist for certain products (in particular, processed food products), although preferential agreements and generalised systems of preferences cover 80% of fish trade. However, this hides a number of peaks and tariff escalation for processed and value-added products that hinders the development of these sectors in developing countries.

111. **Hygiene and sanitary standards:** As traditional restrictions on trade in food products were reduced, attention focused on food safety regulations and other technical measures that can act, implicitly or explicitly, as barriers to trade. From this perspective, safety and hygiene standards can impede trade by imposing higher costs of compliance for exporters than for domestic suppliers. For example, the cost of upgrading sanitary conditions in the Bangladesh frozen shrimp industry to satisfy EU and US hygiene requirements was estimated at USD 17.6 million in 1997-98. The cost of maintaining a HACCP program is estimated to be USD 225 000 per annum (Cato and Lima dos Santos 1998). This can be prohibitive and exclude certain companies, countries and products from the global supply chain.

Developing country issues

112. A lack of adherence to quality and safety standards has been a reason why developed countries are sometimes reluctant to land fish for processing in developing countries (see section on 'harvesting'). For example, Mauritania continues to lack capacity to undertake processing for the international market. Only 39 factories are export-approved and have a limited storage capacity of 700 tonnes. This has major repercussions for the sector's integration into the national economy and constitutes a serious handicap for the expansion of Mauritania's fishing industry (Toueilib, 2007).

113. Major challenges exist for developing countries in the development of Fish Inspection and Quality Control Systems that guarantee quality, health and safety (Box 13). Current SPS requirements may be incompatible with prevailing systems of production and marketing in developing countries, requiring structural and organisational change. Compliance can be costly and trade can be restricted. Many developing countries also lack the technical and financial capacity to be able to participate effectively in food safety negotiations. For developing countries in particular, technical assistance is necessary to ensure that these countries can meet requirements and remain reliable suppliers; this is a major policy challenge

for developed countries if they wish to have continued access to raw materials. Harmonized standards that allow equivalence between developed and developing country standards would enable small-scale producers to be included in the global value chain.

Box 13. The Experience of East Africa

About 58% of fish consumed in the EU comes from non-EU waters, mainly developing countries. This has resulted in reorganisation of fish inspection and quality-control systems in order to access principal markets.

The Nile perch constitutes over 80% of fish exports from the East African region. Over 70% of this fish was exported to the EU member States prior to three separate bans the Nile perch export business in Kenya suffered in 1996, 1997 and 1999, resulting in a decline in fish prices. However, the EU remains the most important export market for Nile Perch for the three East African States and is still the destination of more than 50% of total fish exports from east African countries. The EU market was therefore the driving force behind the three States' effort to ensure the achievement of the highest safety and quality standards. For example, the Kenyan Department of Fisheries embarked on corrective measures to remedy the situation as well as to ensure the country harmonized with EU safety and quality standards in order to be able to fully access the EU market.

EU bans on East Africa's fish exports in the 1990s were considered by Africans to be a form of unfair trade barriers on the pretext of consumer protection as East African countries had no capacity to contest the trade barrier. Now that fish processing establishments and landing sites have been upgraded to and harmonised with EU standards, they are able to market their fish easily and freely in the EU. However, the three countries find it difficult to keep up with new legislation from importing nations, especially the EU, and it often takes time to understand and implement them in domestic legislation.

Source: Gitonga, 2007

Developed country issues

114. Outsourcing has also impacted on developed country producers. The role of China in primary processing has impacted on European processors in countries such as Denmark and Norway. Danish processing plants have become more specialised and focussed on high-quality products that are not mass-produced (Jensen 2007) and which are technically difficult. This higher-level or "tertiary" processing requires sophisticated production equipment and methods, is capital intensive and therefore primarily takes place within developed OECD countries.

115. The EU has one of the world's biggest trade deficits in fish and fishery products, amounting to a record of EUR 11.7 billion in 2005 (European Commission 2007). Reductions in annual catch quotas make the EU's processing sector increasingly dependent on imports from third countries. As Table 7 shows, raw material makes up 60% of overall production costs. As a result, processors that have to import raw material that is subject to restrictions are lobbying for the reduction or removal of tariffs or other impediments that would reduce costs of production and improve competitiveness.

Table 8. Cost of Fish Processing

Proportion of turnover	Whitefish fillets %	Marinated herring %	Smoked salmon %	Prawns %
Raw material	61	59	59	60
Wages and fees	13	14	17	10
- of which salaried	4	4	5	3
- of which hourly paid	9	10	12	7
Depreciation	2	3	2	3

Source: Danish Industry Federation, Dansk Fisk, 2005

Industry consolidation

116. In addition to economies of scale, processing companies integrate backwards in the value chain in order to secure access to raw material (Table 8). All the largest companies are involved in processing and almost each one has integrated sourcing into their value chain – either wild capture or aquaculture. For example, Sealord is jointly owned by the Maori people of New Zealand and the Japanese seafood company Nissui. Sealord has a secure supply of prime fish and shellfish through quota ownership in New Zealand waters and Nissui has a global fishing, processing and marketing network that sells around 220 000 mt of fish and shellfish world-wide annually (www.sealord.co.nz). Nissui, through the acquisition of 50% of Sealord, secured access to an important raw material supply base.

Table 9. Value Chain Integration in the Processing Sector, 2007

Company	Country	Market Capitalisation USD	Turn-over USD million	Business units (associated with fish production)	Fishing	Aquaculture	Processing	Sales and Markets
Marine Harvest ASA	Norway	3 712	840	5		✓	✓	
Nippon Suisan Kaisha Ltd	Japan	1 591	4 593	17	✓	✓	✓	✓
Cermaq ASA	Norway	1 470	1 119	3		✓	✓	
Austevoll Seafood	Norway	1 299	471	9	✓		✓	✓
China Fishery Group Ltd	Cayman Islands	989	156	3	✓		✓	✓
Leröy Seafood Group ASA	Norway	778	835	2			✓	✓
Maruha Corp	Japan	740	6 037	168	✓	✓	✓	✓
Thai Union Frozen Foods Group	Thailand	553	1 457	20			✓	✓
Pescanova S.A.	Spain	526	1 100	12	✓	✓	✓	✓
Connor Bros Income Fund	Canada	504	809	4			✓	✓

Source: MacFarlane (2007) and OECD

117. Industry consolidation may also assist in the managing of internal pricing and reducing some of the production costs companies would otherwise face. In addition, integrating forwards through the ownership of subsidiaries and through mergers and acquisitions can reduce the tax and tariff burdens companies would otherwise face.

118. The majority of large processors are also involved in their own sales and distribution. While some companies opt for setting up wholly owned subsidiaries, consolidation can also take place through acquisitions and mergers. This can assist processors in consolidating their production in either a geographical area or market and forming strategic partnerships which can bring a large geographical spread and better bargaining power. As a result, processing companies may then gain access to core markets, such as the EU, USA and Japan, which otherwise (*e.g.* for reasons of trade restrictions on processed products) may be difficult to penetrate. As a result, they will be able to service the major retail

chains, or even break into the market with their own brands. Alfesca, an Icelandic company, for example, bought a number of French, UK, Norwegian and Spanish processing companies in order to obtain access to EU processed fish product markets, which have high tariff rates (Box 14). Alfesca expanded through the acquisition of brands and processing facilities in major EU markets.

Box 14. Case Study: Alfesca

Alfesca is a leading European producer in its selected categories of smoked seafood, shellfish, blini, spreadables, snacks, regional duck products and other ready-to-eat products. The company's products are sold under its own brand names as well as a substantial presence in the private lables market. Alfesca's predecessor, the Union of Icelandic Fish producers (Sölusamband íslenzkra fiskframleiðenda – SIF), was established in 1932. SIF's group strategy is to strengthen its position in the market for value-added seafood, ensure access to retail distributions, build up its brands and engage in product development.

Starting in 1990, the company embarked on a globalisation path by buying a French saltfish processor in order to obtain access to EU saltfish markets which were firmly protected by tariff barriers at the time. The following years brought more acquisitions, including producers and sellers, the establishment of a sales and distribution company and the launch of fishing operations and saltfish processing in Norway. In 1998, a French value-added seafood producer was also bought. Following these expansion activities in France, SIF established a subsidiary in Brazil and acquired a controlling interest in a Norwegian salmon source. The past decade has seen SIF merge with Iceland Seafood, itself the owner of a major French player in processing, production and distribution of seafood products.

In 2006, a strategic decision was taken to channel the company's main efforts into the production and sale of value-added food products on the European market. This meant the separation of trading activities from the production and sale of ready-to-eat products in Europe; subsequently the company was renamed Alfesca. It now operates 11 production facilities in three countries (France, Spain and the UK). The company's headquarters remain in Iceland. Products are sold under both the retailer's own labels and its own brands, which include Islandia, Skandia, Labeyrie, Blini, Delpierre, Lyons and York.

Source: www.alfesca.com

119. In comparison to Alfesca and Nissui who bought a number of subsidiaries in order to strengthen positions, guarantee supply and access markets, Aker Seafoods ASA owns its own brand and sells to dominant retailers ensuring a strong market presence (Box 15).

Box 15. Case Study: Aker Seafoods ASA

Aker Seafoods is a leading international seafood company and the largest whitefish harvesting company in Europe. Its headquarters are in Oslo, Norway and it has harvesting, processing and sales of whitefish operations in Norway, Denmark and the UK. Aker Seafoods operates 14 trawlers in Norway harvesting cod, saithe and haddock. In 2006, Aker Seafoods controlled 28.3 trawler quotas and had the opportunity to harvest about nine% of total cod quotas above 62°N. Aker Seafood also participates in the shrimp and saithe fisheries in the North Sea and Greenland halibut off Greenland. The annual harvested volume totals about 55 000 tonnes of whitefish and shrimp.

Aker Seafoods is by far the largest supplier of fresh and frozen whitefish products in the Nordic region and controls over 50% of Norway's filleting capacity. The company has an integrated value chain approach with strong ties between harvesting and processing. This strategy potentially results in increased stability as two-thirds of raw material used at its Norwegian processing plants are provided by its own vessels.

Aker Seafoods' products are sold mainly to supermarket chains in Scandinavia and central Europe and have established close connections between its processing plants and the largest supermarkets in Europe. Processing plants are located in Norway and Denmark, delivering fresh filets and loins daily to leading supermarket chains in Europe. Important customers include Primex, Findus, Young's, Nestlé and Seachill.

Source: www.akerseafoods.com

120. Not all of the companies featured in Table 8 began as processing companies. For example, Marine Harvest is an aquaculture company that is now strong in processing; Cermaq originally dealt in other agricultural products; and Maruha Corp was originally a fish trader. Each of these companies has regarded the fishing industry as a strategic investment. Despite reported declining margins due to increased competition, the role of processing is common amongst them and remains key to their overall operation; processing is the sector in which value-addition occurs and is a launch pad for market entry, particularly through the use of strong brands. A strong brand gives processors a strong bargaining position vis-à-vis retailers. By being in control of either harvesting or aquaculture (or both) these companies can exercise strong market power as they have secure supplies. Forward and backward integration, often involving vertical or horizontal foreign direct investment (FDI), creates industry consolidation which acts as a leverage against large, powerful corporations and retail chains. Also, consolidation ensures economies of scale and efficiencies of production are realised in the processing industry, inducing cost efficiencies and price reductions, strengthening brands.

Policy Implementation Gaps in the Processing Sector

121. Important policy challenges face the processing sector as a result of globalisation. Government intervention through the regulatory environment will impact the area of market access and the capacity of developing countries to meet increasing numbers and stringency of standards to ensure food safety and quality. Both developed and developing countries are affected by tariff escalation in relation to value-added fish products and policy gaps remain in easing this burden. There is a particular need for substantial progress in the DDA negotiations in regard to market access by reducing non-tariff barriers and ensuring technical assistance and capacity building in developing countries to allow them to fully benefit from the potential opportunities non-restricted market access can create. Finally, as investment funds (and more generally expansion through acquisitions) are increasingly featuring as a strategy of the largest processors, a more transparent and deregulated investment climate would help ensure that the opportunities brought by globalisation are realised.

Market access

122. Over the past decades, traditional market barriers to trade such as tariffs and quantitative restrictions have been progressively reduced under successive WTO negotiating rounds. However, as mentioned, certain tariff peaks and tariff escalation remain, affecting the ability of processors to benefit from value addition. In addition, non-tariff barriers are increasing in importance and number, limiting the ability of some countries to access developed country markets. Development assistance and capacity building is required for developing country producers that may otherwise be excluded from exporting to certain markets.

Tariff barriers

123. The Uruguay Round significantly reduced tariff rates for fish and fish products from 6.1 to 4.5% in average across-the-board bound tariff rate applied by developed countries from 2000 onwards (or by 26% with full implementation). As a result, the trade weighted applied tariff average on fish and fish products for OECD countries is now 3.1% while the simple tariff average is 7.0% (OECD 2003). Nevertheless, overall tariff structures vary widely among OECD countries, reflecting the relative importance of the harvesting and processing sectors. For example, major importing countries such as the EU, US and Japan maintain tariff profiles that include preferential rates, duty-free access during certain periods and for certain products and the near total removal of tariffs for certain types of products, particularly raw fish and frozen fish.

124. Some countries have expressed concern that the actual tariff rates applied to product lines may be different from the MFN tariff rates. Furthermore, all OECD countries base their tariff nomenclature on the international Harmonised System (HS) administered by the World Customs Organisation. However, due to the way this system is constructed, some species and products do not have a code and are therefore grouped under the section titled 'other', which often attracts a higher rate. The Harmonised System only undergoes substantial changes every 4 to 6 years, putting some exporters at a disadvantage. This issue is likely to become more prevalent as traditional stocks become over-exploited and processors turn to new species. In addition there is an issue of transparency. For example, when tariff information is not readily available, traders may not know what tariffs their exports will be assessed at, adding uncertainty and risk to international transactions (Jensen 2007). Full and accurate disclosure is required to ensure fair market access.

125. This is also the case for rules of origin. Rules of origin are necessary to ensure accurate tariff assessment. As fish are traded in raw, semi-processed and processed forms and are caught by a multitude of vessels in many parts of the world, rules of origin can pose a particular challenge. From the point of view of traders, rules of origin can be conceived as a trade impediment. The proper use and interpretation of rules of origin would enhance the predictability and transparency of the global economy, producing stability and facilitating trade.

126. Despite overall reductions in tariff rates, tariff peaks and escalation still exist, predominantly applied to processed or value-added products as shown in Table 9, which continue to hinder development of the processing sector in both developing and developed countries for certain products. Korea and the EU apply the highest duties and have the highest occurrence of tariff peaks, with 69% and 41% respectively of tariffs higher than 15%. The US has 4% of tariffs over 15% and Japan and Canada have none.

127. Tariff escalation exists when, during subsequent processing stages, the applied tariff increases, resulting in higher effective protection for the processed product. Trade weighted tariff average on imports of processed products to the eleven OECD countries for which data is available is 6.3%, but only 2.5% for unprocessed and less for semi-processing products such as fillets, smoked and salted products. This

produces a bias towards the importation of raw material for the domestic processing industry (OECD 2003). Tariff escalation exists in all OECD countries except Mexico, although it is most pronounced in Poland, Korea, the EU and Japan. Tariff escalation on certain processed products means that exporting country producers do not capture the value-added potentially available from processing of seafood. Reducing tariff escalation will generate further opportunities for developing countries through their participation in international trade of value-added fish products. The liberalisation of tariffs and reductions in peaks and escalation to ensure fair access to markets for processed products remains a policy challenge. The presence of tariff escalation also means, as shown in the Alfesca case above, that companies embark on a different strategy in their globalisation attempts through setting up wholly owned subsidiaries to carry out the processing within the tariff protected market.

Table 10. Trade Weighted Tariff Averages for Eleven OECD countries' Total Imports, Separated by Processing Stages

	HS-Code	AUS	CAN	EU	ISL	JPN	KOR	MEX	NZL	NOR	POL	USA
Un-processed	0301-0303/ 0306-0307	0.0	0.1	2.9	0.0	3.5	12.4	10.2	0.0	0.0	8.2	0.0
Fillets	0 304	0.0	0.0	2.3	0.0	3.9	10.0	16.7	0.0	0.0	7.9	0.0
Smoked, salted etc.	0 305	0.0	0.0	2.0	0.0	1.4	20.0	14.4	0.0	0.0	12.7	0.6
Processed	1604-1605	1.2	1.8	10.4	5.2	7.0	20.0	9.0	1.0	0.0	21.8	0.9

Source: OECD 2003.

Non-Tariff Barriers

128. As tariffs have been reduced, the importance of non-tariff barriers has grown (OECD, 2005). Major importing regions and countries have set stringent standards and regulations to cover food hygiene and safety, labelling, traceability, chain of custody, environmental sustainability etc. The use of non-tariff barriers is the subject of negotiations in the Doha Round of the WTO as non-tariff barriers can hinder access to export markets, making it difficult to take advantage of the opportunities for economic development offered by trade.

129. Sanitary and Phytosanitary requirements are the most recurrent non-tariff barriers and are particularly important to the processing sector. All OECD countries impose a series of sanitary and hygiene requirements for fish. Following the example of the United States, which in 1997 was the first country to introduce the food inspection system Hazard Analysis and Critical Control Point (HACCP), most OECD countries now apply the same or similar systems. While few requirements are attached to direct landings, the number and severity increases with processing stages.

130. The purpose of the SPS Agreement at the WTO and the notification requirement is to increase transparency and with this in mind, the EU has increased the number of notifications of standards and technical regulations to the WTO, increasing requirements developing country products must meet before market access is granted. In 2003 there were 545 notifications for fish, crustaceans and molluscs, compared

to 480 in 2002 and 232 in 2001 (Ahmed 2006). These account for almost one third of EU food notifications, targeting fish mainly from Asia mainly affected followed by Africa and South America.[23]

131. As with tariff barriers, if the application of such measures is unclear or insufficiently transparent, costs may be imposed on exporters. In some cases, the transparency and predictability in the implementation of standards pose bigger challenges than the actual ability and willingness of companies and producers to comply with standards. The Doha Agenda underlines the importance of providing technical assistance and capacity building to developing countries to negotiate and implement WTO rules. Programmes such as the Standards and Trade Development Facility (STDF), a joint effort of FAO, WTO, WHO and OIE, are essential for capacity building and technical assistance to assist developing countries enhance their expertise and capacity to analyse and implement international SPS standards and thus gain and maintain market access.

132. Provisions for using trade measures imposed for environmental or conservation reasons have been increasingly introduced, including the use of quantitative restrictions. Trade measures imposed in support of environmental/conservation efforts by multilateral environmental arrangements such as fisheries management bodies may be tolerated by the WTO as long as the fisheries management body is open to membership without discrimination. These restrictions focus on the harvesting sector but have an indirect impact on the processing sector through chain-of-custody requirements and the marketability of products that do not conform to these standards (OECD 2003).

133. The extent to which such issues influence the strategies of processing companies is not known. It is unlikely however, that outsourcing decisions are based on sanitary and hygiene requirements as all players recognise that these are now *sine qua non*.

Investment climate

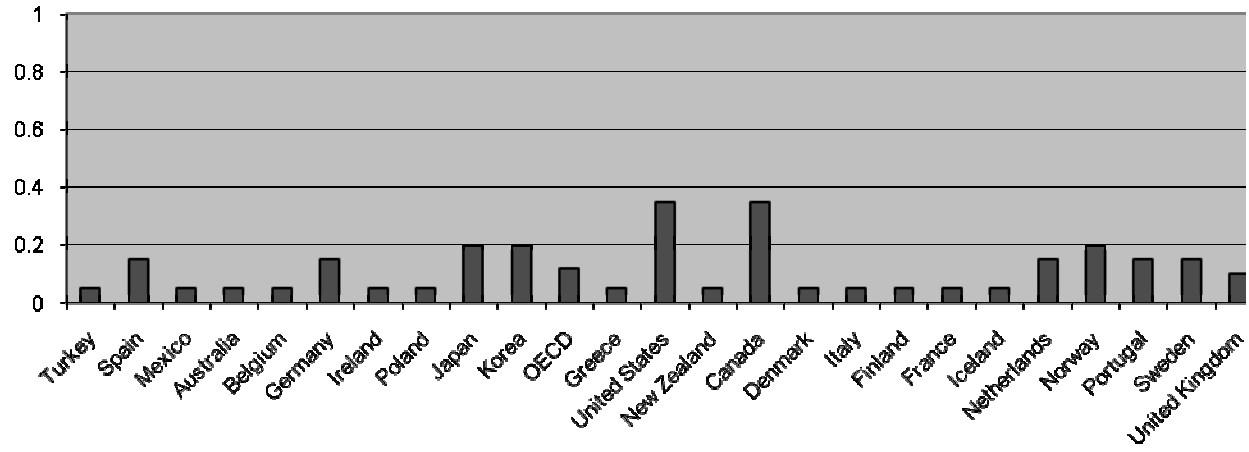
134. Foreign investment participation in fish processing is largely unrestricted and investment funds are increasingly investing in the processing industry as they spot potential for profits. The availability of risk willing capital can help economies to develop and provide employment opportunities. In particular, large US, UK, Swiss, German and French investment funds are operating in the industry, with a Canadian firm (Connor Bros Income Fund) one of the ten largest processors.

135. The ability of a processor to implement its investment strategies may be dependent on the extent of restrictiveness in certain countries. Across the OECD, the average score of restrictiveness is 0.17 (0 equals least restrictive, 1 most restrictive) for FDI. Alongside tariff barriers, the investment climate will influence future globalisation through effects on mergers, acquisitions and investments. A more transparent investment climate will likely see increased competition.

[23] Other requirements not related to the processing industry can be found in OECD (2003), *Liberalising Fisheries Markets, Scope and Effects.*

Figure 14. Restrictiveness of the fisheries processing industry in OECD countries

(0 equals least restrictive, 1 equals most restrictive)



Source: Based on OECD 2006, p.16

GLOBALISATION IN THE RETAIL SECTOR: ISSUES SPECIFIC TO FISHERIES

Global food chains controlled by a globalised retail sector are viewed as decisive factors currently transforming food production and consumption. In general, retailers globalise in order to benefit from economies of scale and to take advantage of foreign supply chains. In fisheries, the sector is characterised by industry consolidation, the growing strength of supermarket own-brands, and a rise in private standards and labels. Significantly, global markets have grown rapidly without a similarly extensive development in public policy, leaving retailers as arguably the front runners in the protection of consumer health and fish safety as well as quality standards. Although the harmonization of standards may provide a 'level playing field', private standards in the sector have generally provided greater food protection than public standards, opening the debate about the legitimate role of public policy in regulating private standards so that they do not become barriers to trade.

Globalisation of the Fish Retail Sector

136. The growth of the broader retail sector has played a pivotal role in increasing the availability of fish to consumers. Large retail stores provide convenience shopping through 'one-stop-shops', meaning they have to cater to a wider range of consumer preferences. On the one hand, having access to such a large customer base affords retailers extensive purchasing power in the seafood value chain. On the other hand, retailers can then provide to their consumers a wide variety of seafood products, often at lower prices than more specialised traditional stores. This leads to increased consumer preferences to use large retailers for their seafood purchases. This section traces the changes in retail trends to the current market dominance of retailers, followed by the growth of fish sales through retailers as a primary distribution point.

137. Traditionally, most seafood points-of-sale were small, specialist, family-owned stores, such as fishmongers, mainly in urban centres. Rapid expansion in the sector in response to consumer demand for convenience shopping and economies of scale with ensuing lower prices resulted in large one-stop-shops, often in out-of-town developments. Recently, however, space restrictions at town and city boundaries in many countries as well as rising concerns about access by lower social groups without personal transport to out-of-town 'superstores' has resulted in restricted growth in these developments. Instead, the largest retailers and particularly food companies are exploring a wide range of other ways to increase their market share. For example, the retail sector has highly diversified itself using a multitude of retail formats that are adapted to local market conditions (convenience stores, supermarkets, superstores and hypermarkets, as shown in Box 16). Retailers are also increasingly acting like conglomerates whose business is no longer confined to retailing (some retailers own farms, logistics centres, produce their own food, manage food laboratories, undertake research, serve as quality assurers and provide an ever-expanding product range such as pharmaceutical products, newspapers, financial products, petrol and clothes). Finally, they provide own-label products across a wide range from luxury to no-frills goods as well as up and coming areas like home delivery services and on-line retailing.

Box 16. Definitions of Retail Stores

Stores by type

Grocery Store: Any retail store selling a line of dry grocery, canned goods or non-food items plus some perishable items.
Supermarket: Any full-line self-service grocery store generating a sales volume of USD 2 million or more annually
Convenience Store: Any full-line, self-service grocery store offering limited line of high-convenience items. Open long hours and provides easy access. The majority sell gasoline with annual sales of USD 2 million or more.
Independent: An operator of fewer than 11 retail stores.
Chain: An operator of 11 or more retail stores.

Stores by Traditional Format

Conventional Supermarket: The original supermarket format offering a full line of groceries, meat, and produce with at least USD 2 million in annual sales. Conventional stores will realize 9% of their sales in General Merchandise/Health and Beauty Care (GM/HBC). These stores typically carry approximately 15,000 items, offer a service deli and frequently a service bakery.
Superstore: A larger version of the conventional supermarket with at least 40,000 square feet in total selling area and 25,000 items. Superstores offer an expanded selection of non-foods (at least 10% GM/HBC).
Food/Drug Combo: A combination of superstore and drug store under a single roof, with common checkouts. GM/HBC represents at least one-third of the selling area and approximately 15% of store sales. These stores also have a pharmacy.
Warehouse Store: A low-margin grocery store offering reduced variety, lower service levels, minimal decor, and a streamlined merchandising presentation, along with aggressive pricing. Generally, warehouse stores don't offer specialty departments, e.g., Xtra.
Super Warehouse: high-volume, hybrid format of a superstore and a warehouse store. Super warehouse stores typically offer a full range of service departments, quality perishables, and reduced prices,
Limited-Assortment Store: A "bare-bones," low-priced grocery store that provides very limited services and carries fewer than 2,000 items with limited-if any-perishables,
Other: The small corner grocery store that carries a limited selection of staples and other convenience goods. These stores generate approximately USD 1 million in business annually.
Convenience Store (Traditional): A small, higher-margin store that offers an edited selection of staple groceries, non-foods, and other convenience food items, i.e., ready-to-heat and ready-to-eat foods. The traditional format includes those stores that started out as strictly convenience stores but might also sell gasoline.
Convenience Store (Petroleum-Based): The petroleum-based stores are primarily gas stations with a convenience store.

Stores by Non Traditional Format

Hypermarket: A very large food and general merchandise store with approximately 180,000 square feet of selling space. While these stores typically devote as much as 75% of the selling area to general merchandise, the food-to-general merchandise sales ratio is typically 60/40.
Wholesale Club: A membership retail/wholesale hybrid with a varied selection and limited variety of products presented in a warehouse-type environment. These 120,000 square-foot stores have 60% to 70% GM/HBC and a grocery line dedicated to large sizes and bulk sales. Memberships include both business accounts and consumer groups.
Mini-Club: A scaled-down version of the wholesale club. The mini-club is approximately one-fourth the size of a typical wholesale club and carries about 60% of the SKUs, including all of the major food and sundry departments and a limited line of merchandise (soft goods, office supplies, and opportunistic, one-time buys). Some of these stores do not have membership fees and often operate as a "cash & carry."
Supercenters: A large food/drug combination store and mass merchandiser under a single roof. The supercenters offer a wide variety of food, as well as non-food merchandise. These stores average more than 170,000 square feet and typically devote as much as 40% of the space to grocery items, e.g., Wal-Mart.
Deep-Discount Drug Store: A low-margin, GM/HBC store with approximately 28,000 square feet of selling space and 25,000 SKUs. These stores typically carry fewer sizes but more GM/HBC brands than a supermarket. Food accounts for 20% of store sales.
Internet: An Internet-based grocery distribution operator. Included in this format are all Internet operators who use the Internet as the primary means of accepting grocery orders for home delivery or pickup. Also included are major food retailers that generate a portion of their sales through Internet-based sales.

Source: Adapted from FMI, *Supermarket Facts: Industry Overview* 2006 available at www.fmi.org/facts_figs/superfact.

138. Despite these efforts, the food retail sector is characterised by increasing competition from farmers' markets, specialist firms offering home delivery service such as organic 'vegetable-boxes', small stores that pool together, rising operating costs in certain areas and increased competition from all forms of internet shopping (are area that is expected to reach 20% of all UK retail sales by 2012). Traditional retailers have no choice but to overhaul trading strategies in order to stay competitive. At the same time, retailers need to remain sensitive to consumer needs, including environmental, health, animal welfare, ethical and fair trade issues. To do this, retailers often use sophisticated techniques to analyse the purchases of core customers through loyalty cards in order to focus marketing and respond to consumer demand in these areas.

139. Global sales of food (including through foodservice establishments) were estimated at USD 4 trillion in 2002 (USD 531 billion in sales of fresh food and USD 1.7 trillion for sales of processed food) (Gehlar and Regmi 2005). Today, the top 30 supermarket grocery chains in the world control an estimated 33% of all global food sales, making supermarkets one of the more powerful transnational corporate forces in operation. However, their power is not just in the distribution of food products but in wielding significant influence in terms of both production and consumption of food products. Retailers no longer just buy what is on offer from suppliers but increasingly determine what they want supplied and the terms and conditions under which commodities should be supplied. As they have direct contact with the final consumer, the conditions retailers impose on suppliers are primarily in response to consumer concerns in order to protect their crucial but fragile reputations. Retailers are increasingly held accountable for local and global needs and concerns such as social responsibility, environmental impact and sustainability, which impact down the value chain.

140. Retail influence also extends into the regulatory sphere. Powerful retailers are leading the way in industry standards through the use of private labels and in-house standards in the areas of safety, quality and the environment. These standards, which are often years ahead of public policy, could become de facto standards in situation where retailers have a monopoly over setting the standards, interpretation and enforcement. This raises issues of legitimacy and equity (Burch and Lawrence 2007). Appropriation by non-state actors of an essentially public function could limit representation, protection of minorities and accountability in the areas in which standards are set.

141. Despite their phenomenal growth, most retailers still operate in their home country only. Among the world's 250 largest retailers, 107 had no international operations in 2005. Those that were the most active in international markets were retailers from relatively small OECD countries (and South Africa) that face limited scope for expansion in their home markets (Table 11). Ninety three percent of the top 250 retailers have their headquarters in the United States. South Africa dominates the list of retailers from non-OECD countries (Nordas 2007). The world's largest retailer is Wal-Mart (USA) which alone accounted for 10% of the top 250's sales in 2005, followed by Carrefour (France) with 3%. Retailers that sell mainly food and groceries tend to saturate one market before moving to the next while speciality retailers (clothing, electronics) internationalise faster (Deloitte 2007).

Table 11. World Top 10 Food Retailers

Rank	Company	Home country	Net sales EUR million	Approx % of total sales	Foreign sales %	Number of countries
1	Wal-Mart	USA	251 357	10	23	15
2	Carrefour	France	74 497	3	53	31
3	Tesco	UK	56 020	2.2	23	14
4	Metro Group	Germany	55 722	2.2	52	30
5	Kroger	USA	48 717	1.9	0	1
6	Ahold	Netherlands	44 496	1.8	82	11
7	Target	USA	42 334	1.7	0	1
8	Costco	USA	41 725	1.6	20	7
9	Rewe	Germany	41 700	1.6	31	13
10	Schwarz group	Germany	36 849	1.4	44	22

Source: Nordas, 2007

Growth of sales in seafood through the retail sector

142. The way consumers acquire fish has undergone substantial change over the past decades. Naturally, in line with growth in the retail sector, sales of seafood through retailers have also increased. Over time, supermarkets and caterers have become more important distributors of fish and fish products and the share of fish and fish products sold through supermarkets has increased considerably over the past decades (Table 12). Sales via retailers accounted for 61.3% of fresh and frozen fish product sales volumes in 1999 (www.itsfood.com)

Table 12. Supermarket Shares of Sales of Fish and Fish Products

Country	Supermarket share of total fish and fish product sales %	Supermarket share of total retail sales of fish and fish products, %
France	59	85
Germany	50	85
UK	50	90
Spain	45	60
Italy	42	60
United States	40	90

Source: FAO, OECD, Montfort (personal communication)

143. The type of seafood products purchased through retailers has also been changing. Partly, this is due to the changing nature of seafood trade and partly due to changing consumer preferences. Fresh fish that has undergone no processing is highly perishable. In order to preserve shelf life, more than 90% of trade of fish and fishery products consists of processed products in one form or another. In addition, the drive for fish-based convenience products can be seen in increasing consumer preferences for ready-to-cook fish products at the expense of fresh/chilled wet fish. With a 40.7% volume share in 1999, frozen fish products accounted for the largest single share of global retail fish sales although value-added chilled fish products have experienced the largest growth. Canned fish sales have remained fairly static, but still represent sizable volumes, largely due to canned tuna (www.itsfood.com).

144. The rise in aquaculture industries over the last two decades has coincided with the growth in importance of supermarkets in fish retailing. This growth requires a continuity of supply. Farmed salmon has seen a remarkable increase over this period due to its availability in line with contractual requirements by supermarkets, low prices, and its suitability for a variety of different value-added products. Salmon retail grew 62.4% between 1995 and 2000. Supermarkets have played a decisive role in the popularization of salmon through promotions and salmon has moved from a high-price luxury product in the 1970s, to an everyday fish option today.

Retail Industry Expansion and Consolidation

145. The retail industry is experiencing both expansion and consolidation in response to the opportunities and pressures of globalisation. Although most retailers are anchored to home markets, saturation in the home market and the pursuit of further profits means that many retailers have expanded abroad. With a greater proportion of fish products going through supermarkets, consolidation is occurring as retailers favour close relationships with few suppliers in order to guarantee quality, volume, efficiency and traceability. Large suppliers are also better equipped to import fish and benefit from less volatile international markets. In addition, traceability and labeling requirements promote the use of contracted suppliers as chain of custody certification is more easily verifiable. This is likely to result in increased sourcing of fish from a few key suppliers through centralised distribution. Retailers may liaise directly with the harvesting element of the value chain and source directly from landing sites. For example, initiatives by British supermarkets such as Tesco and Asda include direct contract relations with trawlers on the basis of detailed quality and delivery specifications (MacFarlane 2007).

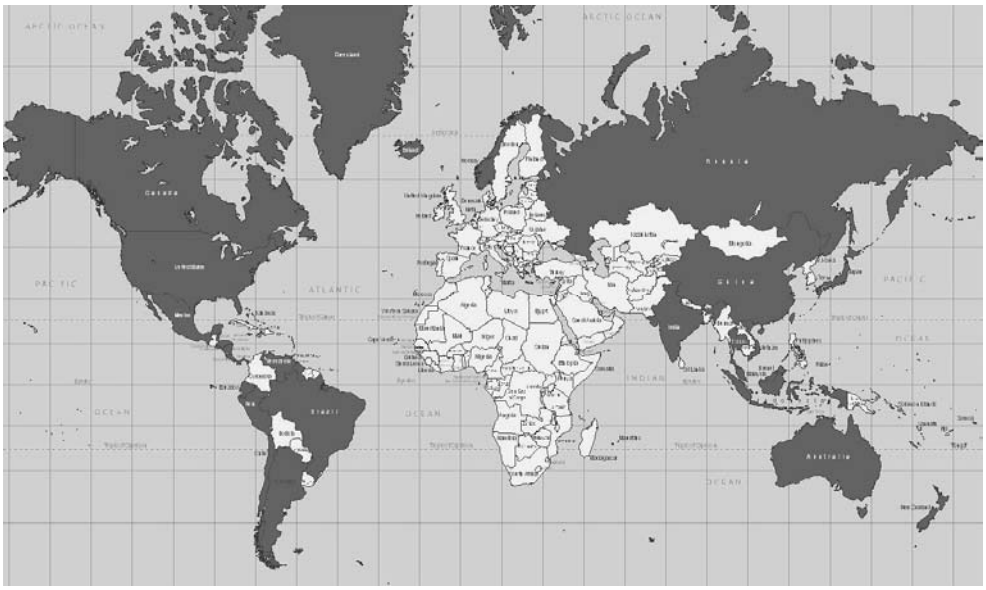
146. At the same time, retailers are stream-lining supply chains as a result of increasing economic and competitive pressures (Nordas 2007). Meeting the growing demand of increasingly selective consumers for product variety while keeping inventories and costs down, has resulted in lean but large retailers (MacFarlane 2007). The outcome is that power is shifting to the consumer end of the market (resulting in a demand-driven value chain) and small producers may find they are ‘locked-in’ and that it is difficult to move away from low-margin processes in order to capture downstream value (Fenton 2006).

International sourcing

147. Seafood businesses are reliant on secure and stable supplies of fish. Supply structures are increasingly the result of demand by retailers for consistency and volume from suppliers. This will impact on sourcing practices, which are undergoing a progressive re-organisation.

148. The increasing share of sales though supermarkets combined with overfishing in traditional fisheries and a growing demand for fish and fish products has meant that supermarkets are sourcing products from a growing variety of countries. For example, Wall-Mart is sourcing fish from 70 countries while Tesco sources from 38 countries (Peter Hajipieris 2007). Darden restaurants source seafood from more than 30 countries by contracting directly with the producer in the country of origin (Figure 13).

Figure 15. Darden -- A Global Seafood Purchaser (from countries in dark)



Source: Roger Bing Wal-Mart from *Globalisation and Fisheries : Proceedings of an OECD/FAO Workshop*, (to be published shortly) 2007.

149. However, as mentioned earlier, some supermarkets choose sourcing location according to the nature of the product. For example, in the case of Tesco, freshness requirements and transport costs mean that fresh fish is likely to be sourced locally. On the other hand, frozen fish, convenience packs and canned fish can be transported over greater distances. Box 17 illustrates this with the example of the French supermarket chain Carrefour's sourcing and fisheries policies. Carrefour sources its fresh fish from the country of store location as much as possible. Frozen and canned products are handled through a central distribution point for the most important species, while other species that relate to local tastes are purchased by each country office.

Box 17. Carrefour and its sourcing and fisheries policies

Carrefour is a French supermarket chain that is currently the second largest retailer in the world with 1 080 stores, 430 000 employees and sales (including tax) of EUR 90.7 billion per annum. Carrefour is predominantly focused on the European market and 87.6% of its stores are located on the European continent (51% in France itself), 6.3% in Latin America and 6.1 in Asia. The group operates in 29 countries and today, 52% of group turnover derives from outside France.

Carrefour sources as much of its fresh produce as possible, including fish, from the country of store location due to the short shelf-life of such products. Frozen products are purchased from a central purchasing office for the most important fish species. Other species are managed by each country according to specific local consumption patterns. Canned products are also handled centrally for main fish species.

In light of increased media attention given to the problem of over-exploitation of ocean resources, the Carrefour group decided to promote sustainable fishing as part of an overall sustainable management of resources policy. In 2004, the Responsible Fishing Code was launched. The Code ensures that Carrefour undertakes environmental audits of catching areas, vessels, factories etc., as well as improved purchasing from small-scale fisheries in order to promote local know-how and ensure cooperation with specialised organizations such as the Groundfish Forum, WWF etc. In the fresh seafood department, the Code means that the Carrefour group favours shrimp accredited by the Global Aquaculture Alliance (GAA) and promotes herbivore species in order to limit the inclusion of deep-water species within its catalogues. For its own-brand seafood, Carrefour will not source from unsustainable stocks, fish must be GMO-free, no allergenic products can be used in processing and only natural additives. Finally, from 2007 onwards, Carrefour stores will begin to source MSC-certified products.

In order to achieve these goals, Carrefour has strong relationships with suppliers through long-term contracts. It does this through a global policy of direct relationships with producers in harvesting and processing to ensure sustainability from method-of-capture to socio-economic considerations in the fishery.

Product	Carrefour (France)	All retailers (France)
Fresh	64 000	160 272
Frozen	42 000	121 236
Canned	32 000	105 728
Other (smoked, ready meals, surimi etc)	22 000	67 581
Total	160 000	454 818

Source: www.carrefour.com; Gaebel, 2007

150. Company-wide sourcing and sustainability policies such as those found in Carrefour lead to an increased need for sustainability and chain-of-custody traceability and security. As well as direct contracts with the harvesting element of the value chain, a need by retailers for traceability may result in a shift towards a reliance on aquaculture. Wild fish has little inbuilt flexibility regarding adjustment of supply and long-term availability is determined by biological forces that may have been subject to poor management. Aquaculture supply of fish, on the other hand, can be adjusted in the short-term by altering harvest time and in the long term by the number of active farms.

151. Table 13 is a summary of the different sourcing policies (for all products) of selected retailers.

Table 13. Sourcing of Selected Retailers (All Products)

Company	Sourcing	Number of Suppliers
Ahold	Global, distribution at regional level	10 000
Carrefour	Food items sourced locally, representing 90% of total sales value	4 000 – 15 000 on a national basis, depending on where it operates
Metro	90% of food products comprising 70-80% of total sales are locally sourced. Remaining 10% sourced internationally	12 500
Tesco	Locally, unless conditions prevent this	4 000

Source: Nordas, 2007.

Home brands

152. Home brands (or own-brand) are a brand that is sold exclusively by a specific retail chain, usually under its name (Nordas 2007). Home brands first appeared as a cheaper, lower-quality alternative to branded goods and is increasingly evident in the fish retail sector (*e.g.* Tesco, Wal-Mart). However, their rise in market share is revealed by the ready-meals market where home brands accounted for 95% of home-ready meals sold in the UK in 2006 (Burch and Lawrence 2007). On average, the price of private labels was 31% lower than comparable branded goods. However, the gross margin on private labels averaged 35% in 2000, compared to 25% for branded goods. The aggregate value of private labels in 36 countries was 15% of total supermarket sales in 2003, growing to 17% in 2005. The share varies between countries and is higher in Europe than in other regions (Nordas 2007).

153. Private label products are typically developed and standardized by the retailer and produced by a limited number of suppliers on a contractual basis. With a private label, the retailer takes more responsibility for controlling the supply chain, including product innovation and marketing. This increases the retailer's margin but also exposes it to market-risks, including consumer concerns over environmental and social conditions. As a good reputation translates into brand loyalty and therefore sales, retailers may impose strict standards on its suppliers. These standards could become *de facto* industry standards with no public regulatory basis. If suppliers in developing countries do not have the sufficient scale, reliability or capability to meet these standards, their market access may be blocked, but with little recourse to normal public dispute settlement processes.

154. Supermarkets are using seafood as a leading product sector of their responsibility-brand positioning, and in particular, social and environmental aspects. Wal-Mart in the US, and Waitrose and Tesco in the UK, are all publicly committing themselves to responsible sourcing for their fish home brands (MacFarlane2007)[24] (Box 18). Twelve European retail chains (including Tesco, Metro, Intermarché and Asda) area using the MSC-logo on 74 products sold under the retailer's own brand. However, limited coverage of the MSC-logo in retailer-branded products in key seafood markets such as Spain, France and

[24] This is the case for capture fisheries, with most supermarkets using MSC-certified stocks for sourcing. As no similar scheme exists for aquaculture, organically farmed fish is occupying the sustainably-farmed product niche

Italy is striking. Although MSC-labelled retail sales grew 76% in 2005-6, current retail sales of products carrying sustainability logos remain marginal in the context of overall seafood sales in Europe at around 1% (O'Sullivan 2005).

Box 18. Sustainable Fish at Wal-Mart

"Wal-Mart bears a responsibility to provide safe wholesome seafood that is fished responsibly and expect to exclusively market fully sustainable species of fish within 5-7 years"

Wal-Mart's goal from February 2006 is to procure all wild-caught seafood for North America from fisheries certified to the MSC standard within the next three to five years. The range and volume of MSC eco-labeled seafood products is set to increase as more suppliers meet Wal-Mart's requirements for processing and handling sustainable seafood. Furthermore, Wal-Mart's supply fisheries have begun to engage in the early stages of the MSC assessment process.

Certification is Wal-Mart's largest sustainable initiative and currently, the MSC eco-label is on ten fish products. The ecolabel is an easy way for consumers to identify seafood from fisheries that meet the MSC's strict environmental standards. The projected volume of MSC products sold through Wal-Mart stores in 2007 is USD 56 million. 5 000 mt of Wal-Mart's supply (22%) can be certified in the short term, 11% in the medium term and 67% in the long term. 1000 mt of certified product is already on sale. A further 11 000 mt of farmed product is also on sale but cannot be certified.

In the case of shrimp in 2004, Conservation International work with Wal-Mart on seafood sustainability issues. The ACC certification program was approved October 2005. Processing facilities were certified in the summer of 2006 (65 facilities). Next phase is farm certification to be concluded by the end of 2007. By 2008, Wal-mart will only buy farm raised shrimp from ACC certified sources.

Source: www.walmartstores.com, and Redmond, 2007

155. Most retailers do not actually produce their own-brand product, but rely on a small number of suppliers with whom they develop close relationships. The economic benefits resulting from the success of own-brands may be offset by an increase in the level of risk for those retailers who invest in own-brand products as it is the retailer that is held accountable by regulators and consumers for the safety and quality of the end product. By delegating the task to upstream suppliers, the need for standardized processes and quality is crucial in order to protect the retailers' reputation and market share (Hornibrook and Fearne 2005).

Private standards

156. In general, the presence of asymmetric information and externalities mean fish markets do not always necessarily provide a socially-optimum level of food safety and quality standards. Consequently, public institutions use regulation to invoke mandatory standards to achieve a socially-desirably level of protection for human health, enforced through official inspection (Henson, 2006). Despite these safeguards and advances in scientific understanding of the risks associated with food, high profile food scares still occur, fuelling consumer concerns and eroding confidence in existing public mechanisms of food safety control. The reaction by private industry to this and in order to address the problem of asymmetric information has been to build in a larger margin for containing potential risks by the adoption of private (stricter) standards.

157. The fisheries sector is not insulated from these problems and, in fact, may arguably be more exposed due to the nature of the product: fish may be exposed to heavy metals such as lead, mercury and cadmium in the wild; a recent scare centred on PCB and dioxin levels in farmed salmon as well as the Infectious Salmon Anaemia (ISA) virus; and increasing media attention on sourcing of wild fish products

means that supermarkets are expanding their 'sustainability' portfolios, often using fisheries as their lead example.

158. Retailers are at the consumer end of the value chain and have the greatest incentives to implement standards where they are missing or inadequate in the public sphere, to ensure the health and safety of their products, thereby self-governing their commercial and reputational interests. Consequently, the mitigation of risk by retailers, as well as consumer demand for quality and safety standards, transparency, traceability and 'responsibility standards' (environmental and ethical), has resulted in the rise of various food standard, safety and quality schemes, driven from the 'front' by retailers and self-enforced across the supply chain. Responsiveness to consumer demand has become a powerful justification for this sort of retail strategy (Wilkinson 2006).

159. In the case of fisheries, in late 2005, Greenpeace published a report that ranked UK retailers according to their sustainable seafood buying practices. Asda, Wal-Mart's sister company, ranked last. Greenpeace used highly visible tactics including a rooftop demonstration to protest at Asda's use of endangered or 'at risk' sources. By January 2006, Asda released details of their new sourcing policy, which removed fish determined as unsustainable by Greenpeace. Significantly, Wal-Mart has also agreed to source of its wild-caught fresh and frozen fish for the North American market from fisheries that meet the Marine Stewardship Council's (MSC) independent environmental standards for sustainable and well-managed fisheries. The case highlights not just the reputational risks that retailers face that drive their consumer-oriented policies, but the increasing privatization of environmental governance through the participation of non-state actors, the nature of retail standards and the reliance on markets to stimulate compliance (Stokke 2004).

160. These private standards permit the production, identification and preservation of product and process characteristics throughout the supply chain, in a consistent manner, over time. The rise of private standards can also be attributed to other drivers. For example, private standards also act to coordinate supply chains by standardising product requirements across suppliers. Second, as supply chains become more global and are subject to varying regulatory environments, internal retailer-standards reduce transaction costs and other risks associated with procurement.

161. However, the increasing power of retailers in the area of standard setting means that retailers are in many cases the gatekeepers of food safety. Consolidation in the industry means that the number of large global food retailers is falling. At the same time, the economic advantage of standardization means that the majority of suppliers may adopt similar or near-identical standards even without public intervention. Although these standards are private-sector driven and voluntary (i.e. cannot be legally mandated), yet, through market transactions, particularly as supply chains expand across borders, these standards become mandatory in practise (Figure 14). As a result, the value chain in developed countries can be characterized as one of oligopoly as suppliers may have little option but to comply if they wish to enter or remain in that market. Where buyer standards predominate, the key issue for any exporter is to gain access to a given buyer's supply chain rather than the national market *per se*. As a diminishing number of leading retailers (and food service) govern these supply chains a declining number of private standards lay down the conditions for entry, there is greater scope for exclusion from entire markets. For those exporters who do gain access, the benefits of being a 'preferred supplier' are enormous (Henson 2006).

Figure 16. Legal Forms of Food Safety and Quality Standards

Source: Henson, 2006

162. High competition means that retailers use standards to emphasise quality attributes of their own products (quality-based competition). In this way, retailers may harness consumer concerns in order to differentiate their products in competitive quality-defined markets.

Policy Implementation Gaps

The 'leading role' of private standards

163. The key policy challenge facing governments in relation to the retail sector is how to respond to the increasing role of private standards. Indeed, it must be asked if a policy response is required at all. Private standards are the outcome of 'pushing' by NGOs and consumer demand, and 'pulling' by retailers in order to protect their reputations and the interests of shareholders. This section will look at the policy concerns private standards give rise to: the impact of private standards on developing countries and the legitimacy of private standards, and the potential policy options available to governments, such as the provision of minimum standards or the harmonization of standards.

164. The increasing role of private standards is an outcome of the positioning of retailers at the forefront of setting industry standards, which may be higher than regulatory provisions. This can have enormous effects on suppliers (particularly for, but not limited to, developing countries), with no recourse to dispute settlement processes in the international trade regulation system. Retailers are setting industry standards not because of a lack of regulation in the fisheries sector *per* se, as indeed the fisheries sector has a long history of prescriptive governance, but because of a perceived failure by governments to create and implement adequate legal obligations to cope with specific challenges.

165. As a result, there is increasing recognition of the adverse impact private standards can have on developing countries trying to access potentially lucrative high-value markets. The increased emphasis by food retailers on food safety, quality and responsibility has led to an increased focus on the hazards represented by imported food products, including fish and fishery products. Tighter scrutiny of processing factories and new requirements to access lucrative value chains means that some developing countries perceive the regulations, procedures and document requirements as constituting informal trade barriers. Unclear requirements in the face of a multitude of standards leads to higher risks and costs, reducing profits for exporters, including those in developing countries (FAO, 2002).

166. To promote the legitimacy of standards, retailers do tend to work with a wide variety of stakeholders in standard-setting and, perhaps in light of consumer concerns, private standards have become more inclusive through the participation of non-commercial interests such as NGOs, consumer groups and developing countries (Henson, 2006). For example, the MSC undertook an open, transparent and inclusive procedure when establishing its Principles and Criteria, now turning its attention increasingly to data-

deficient fisheries. For their part, retailers often do help existing suppliers to comply with new standards and once an exporter has been certified they are able to gain access to the supply chain of all buyers that accept this standard, reducing the transaction costs associated with global supply chains. Achieving a standard also has a high signal value even to customers that do not require the standard. Governments will have to consider how private standards affect domestic regulatory capacity, since they are in effect, a form of self-regulation by the industry. Relying on voluntary initiatives in fisheries lowers the cost of influencing and monitoring business behavior but has not yet relieved the pressure on governments to intervene in the sector.

167. The reason for slow government responses may have to do with fears regarding incompatibility with international trade rules. However, the World Trade Organization (WTO) makes provisions for instances when member states wish to legislate for the environment and human health in a manner that conflicts with the principles of unrestricted trade. The WTO advises that governments pursue non-discriminatory measures that, to the extent possible, rely on existing international standards, mutual recognition and involve foreign stakeholders in their preparation, adoption and execution. One policy option is to legislate for minimum standards in the industry. To some extent, governments have tentatively begun to work in this area through the forum of the United Nations Food and Agriculture Organisation (FAO) to establish minimum substantive requirements for ecolabelling schemes.

168. As the number and relationships between standards are growing increasingly complex, a second public policy option is to harmonise standards. Private seafood standards differ widely across countries, products and customers and can vary from global, multi-criteria, third-party schemes (MSC) to those with high government involvement (AIDCP Dolphin Safe Programme). Governments have shied away from enacting mandatory minimum standards because they would encounter market-access problems at the WTO. The harmonization of private standard schemes would be unlikely to pose any restraint on existing schemes for fisheries in light of the necessity of involving the lowest common denominator. The outcome is that a fear of violating international trade rules or reining in the industry has led to a lack of regulatory stringency for private schemes (Stokke 2004).

169. Consequently, private standards fall outside the scope of existing institutions aimed at providing discipline in the use of food standards (Henson 2006). Nevertheless, in 2002, new EU regulation stated that retailers are considered as producers of their own home brands (Gaebel 2007). This means that internal standards within supermarket supply chains are often tougher than legal requirements in order to protect the brand and, by default, the supermarket's reputation.

170. In summary, global markets have grown rapidly without parallel development of public policy, leaving retailers as the front runners in the protection of consumer health and safety as well as in the development of quality standards such as the sustainability of fish stocks. This is not necessarily a bad scenario, as retailers are often able to move faster in response to consumer demand. However, it does raise the interesting policy challenge of sensible public regulatory responses, especially regarding environmental labels that offer a private judgment on publically managed fish stocks. If policy-makers leave the governance of private standards to global supply chains, the outcome may be more stringent standards that use market demand to achieve environmental goals, but potentially at the expense of market access by developing country producers. In practice however, consumers, through their purchasing power, may even hold supermarkets accountable in this area. Certainly, if retailers sense their reputation at risk from a lack of transparency and stakeholder participation in their schemes, they are likely to move quickly.

171. Nevertheless, it does not detract from the fact that suppliers without the ability to meet private retail standards that may be stricter than public standards may still lose market access. In this respect, the role of public policy may not be to curb private standards, but to assist small producers in attaining these standards through development assistance. In any case, retailers, suppliers and public policy makers all

have the same aim: to gain from globalisation. Ensuring potentially disadvantaged suppliers rise to that challenge should be the area in which governments focus their work.

ISSUES ACROSS THE FISHERIES VALUE CHAIN

The previous sections have dealt with globalisation issues that are specific to each element of the value chain and identified a number of policy implementation gaps. The following will seek to deal with issues that all value chain elements are facing. The purpose of identifying and analysing such "common, threats, issues and challenges" is to highlight areas where policy makers may have a particularly important role. Because these areas are common to the value chain, they are likely to be more difficult to deal with as each value chain element may have different expectations as to the right policy to follow. The four themes are: the role and impact of opinion formers; fish as an element of the food basket; dealing with irresponsible activities; and protecting shareholders' interests.

The Role and Impact of Opinion Formers

172. Over the past decade the fisheries world has witnessed a sea change in terms of information on fisheries in the public domain. This has taken place in two areas in particular *i.e.* a new wealth of business related information ("fish newspapers", professional magazines, etc.) and environmentally related information in particular dealing with fisheries sustainability and environmentally sound aquaculture practices. Thus, a distinct group of "sustainability opinion formers" have established themselves and have proven quite durable.

173. This has taken place against a background of a political environment that often has been seeking to cater to specific interests along the value chain (foremost the harvesting sector). Issues raised by fisheries value chain stakeholders are specific have been addressed by policy makers and fisheries administrations on a directed basis. In some cases the result may have been implementation of conflicting policies and measures. Also, as policy makers have addressed specific concerns along the value chain, holistic and all encompassing solutions to the problems faced by the fisheries sector have not been implemented.

Box 19. The Packard Foundation: An Example of a Sustainability Opinion-Former

The Marine Fisheries Subprogram is one of the largest of the (Packard) Foundation's conservation initiatives. In 2007, it will make grants of approximately USD 20 million. The Marine Fisheries Subprogram's goal is to restore and maintain healthy, productive marine ecosystems capable of contributing to vigorous coastal communities and to economies, food systems, and communities beyond the coast. The Marine Fisheries strategy fosters the development of fisheries management practices and seafood markets geared toward both fishery and ecosystem sustainability. On the market side, the long-term outcome is to stimulate substantial demand for certified seafood so that retailers and suppliers increasingly distribute certified seafood and eventually advocate for regulation that incorporates sustainability in the supply chain in a way that strengthens and conserves marine ecosystems.

Source: http://www.packard.org/genericDetails.aspx?RootCatID=2&CategoryID=47&ItemID=3586

174. A number of non-governmental groups are active in the fisheries sector; most notable among these are Greenpeace and WWF but there are numerous other lesser know organisations that also offer opinions (Box 16). A couple of non-governmental organisation furthermore offer services to sustain their

objectives e.g. Marine Stewardship Council (accreditation, labelling for sustainable fisheries) and the Global Aquaculture Alliance (standards and good practices in support of environmentally responsible aquaculture). They are not necessarily based on the same modus operandi but common for them is that they promote their views on what they see are particular prolific issues in the fisheries sector. In addition, as highlighted by a food service representative at the Workshop on the Opportunities and Challenges of Globalisation, the number of seafood industry standard and labelling, and hence opinion formers, have grown considerably in recent years.

175. In this environment of forming public opinion, many operators in the fisheries value chain have embarked on a dialogue with the NGO community, most notably the supermarket operators. This has taken time and courage on behalf of both the NGOs and the fisheries operators; while ultimately they may share the objective of sustainable fisheries the two groups do not share the same "language" or working methods and there are often major differences in personalities and tradition. However, only in rare cases have public authorities been partnering in these ventures despite fisheries sustainability clearly is a policy of the public domain.

176. The response of the fishing industry has been varied, developed over time and is also dependent on the value chain. As an immediate response, supermarkets have developed sustainability specifications in their buying criteria, banned certain seafood from their counters due to resource difficulties or fishing method. Loose cooperative arrangements between the NGO community and fishing operators have developed (e.g. Seafood Choices Alliance). In some rare instances (e.g. Unilever/WWF[25]; McDonalds/Conservation International[26]) strategic partnerships have been the result.

177. In terms of policy implementation gaps it is clearly interesting to observe how little public authorities have been involved in an otherwise rapidly changing fisheries information environment. Most OECD governments have taken a "wait and see" attitude which has opened an information gap for consumers that wish to better know the environmental consequences of what they are eating. One major question is if public authorities can constructively engage in the dialogue and regain the lost space, it may improve the credibility of fisheries information but, as a payback, the industry and NGO are likely to demand more proactive policy action on the conservation side ensuring that fisheries are sustainably managed.

Fish is Just One element of the Food Basket

178. Throughout this Study the fisheries sector, broadly speaking, has been seen in isolation from other food providers. However, fish is in competition; there are many other elements in the food basket (various meats, fruits, vegetables) that can substitute fish albeit not perfectly. While fish are protein rich, rich in certain vitamins and Omega 3, many of these healthy properties can be taken away or reduced depending on how the fish is ultimately prepared and cooked. The promotion of healthy properties therefore has to take into account the way consumers use the food stuff they purchase.

179. Other food sectors are not subject to the same production economics as the fisheries sector. In many cases the fisheries sector lack stability and predictability in sourcing raw material. In the fisheries sector, the value chain is entirely dependent on a natural renewable resource base. This is a particular challenge.

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25 http://www.unilever.com/Images/Unilevers%20Fish%20Sustainability%20Initiative_tcm13-9157.pdf

26 On the work between McDonald's Corporation and Conservation International on developing criteria for whitefish
see http://www.mcdonalds.com/corp/values/purchasing/supply_initiative/sustainable_fisheries.html

180. As evidenced in earlier sections some companies have, through own initiatives, taken control of the harvesting/aquaculture value chain element to secure supplies. There are examples of processors who own fishing vessels and aquaculture installations. A rare example is a French supermarket chain Intermarché which owns Scapêche, a fishing fleet that fish in the Atlantic, Austral and Antarctic oceans, process and freeze seafood for sale in Europe.

181. The entire fisheries value chain faces sharp competition with other food providers that do not face the same economic environment. Food and agriculture policies impact on the way the fisheries sector will function in the future and how profitable it may be to operate in the industry.

182. A fully stable and predictable fisheries environment is difficult to obtain but government policies can help make the situation better, and hence lend a helping hand to all value chain elements. For example, when quotas are managed to better time the market requirements (*e.g.* in some management setting through dividing quotas in monthly instalments (Denmark); leave decisions to fishers through property or use rights (Iceland, New Zealand), fishers usually gets higher prices and can more easily manage fishing costs and may also be helpful in making the harvesting sector more economically viable. In addition, it is likely that the whole fisheries value chain would benefit from such a change.

Dealing with Irresponsible Activities

183. In recent years IUU activities, national and international, have been an increasingly difficult problem which, inter alia, is linked to the poor economic return that many fisheries experience. While the fisheries management settings are crucial for improving fishers income, various value chain elements have increasingly taken measures to deal with the problem. Buying specifications of many retailers, fish brokers and processors include specific references to avoiding "tainted" fish, institute chain of custody verification and more generally check the providence of their supplies. Some retailers report that close relationships (buyers and sellers) are needed to build trust. This is followed up by auditing quality of suppliers on a regular basis. The obvious reason for doing this is to protect their brand from attacks from stakeholders and to adhere to corporate and social responsibility. It is better to be proactive and anticipate than to end up in the middle of a food scare crises.

184. However, public authorities can also help through the regulatory framework through a number of actions:

- Increase the amount of surveillance
- Increase levels of penalty for IUU offenders
- Apply trade measures
- Institute catch and trade documentation schemes (traceability)
- Step up the enforcement of existing rules
- Engage in closer cooperation with the fisheries chain of custody

185. Perhaps more importantly also here it would benefit stakeholders in the fishing industry, including policy makers, to search for cooperative solutions. Through common stance and action among the various value chain elements and the public authorities the chances for dealing with the problems of IUU will be greatly enhanced.

Global Versus Local Operations

186. Private enterprises throughout the fisheries value chain comprise companies whose main purpose is to make money for their shareholders/owners. Such companies have to develop a strategy that, while taking account of the limits imposed by a natural renewable resource that need responsible and sustainable

management, can ensure long term profits and highest return on invested capital. The bottom line is that non-profitable companies are unlikely to be staying for long in the fish business; if profits are higher in other types of investments investors are likely to seek new grounds.

187. There are fishing companies that chose to embark on short term strategies without regard to the longer term effect of overfishing and involvement in IUU activities. Unless such companies' incentive structures are addressed through interventions by public authorities and/or opinion formers, they may gain a short term competitive advantage and participate in undermining the future of the global fishing industry. In this respect the economy of open access equally applies to individual companies along the value chain. It is likely that companies with a short term business strategy are small and individually owned and as such can hide away from the public opinion and scrutiny.

188. Major listed companies are under a more severe analysis by potential investors, and may be subject to more stringent company and stock exchange legislation and regulations dealing with social and corporate responsibility. In such situations long term business strategies that pay attention, inter alia, to the sustainability of the resource base etc. are likely to be prevalent. An overview of the major businesses involved in fishing (list in annex) seems to confirm that listed companies do pay attention to such issues as sustainability, IUU, environmental footprint, good aquaculture practices etc. This may not necessarily be the case for small companies and may need to be addressed by policy makers.

189. In may well be that in natural resource sectors like fisheries (oil and gas extraction, mining may be other cases) the best long term business strategy, and hence our understanding of a globalisation pathway, due to the paramount importance of securing access to supplies, is through internationalisation of assets. The business case of expanding to consumers in new markets is shared with other sectors, the case of outsourcing or fragmenting production to gain access to cheaper labour is also shared with other sectors. But where the fisheries sector stands out is on the "access to raw materials" side which is a key strategic consideration in ensuring shareholder values.

190. This may help explain why, among the major 30 companies that have been analysed for this study, only few (Alfesca, Thai Union Frozen Foods Group and Connor Bros being examples) globalise through acquisition of consumer brands (and processing facilities); the business strategy here (over and above growing market potential) is one of getting in "under" the tariff protection. In most other cases expansion domestically or abroad has been through the acquisition or start up of fishing or aquaculture companies depending on the markets for final products that the given company traditional has been involved in.

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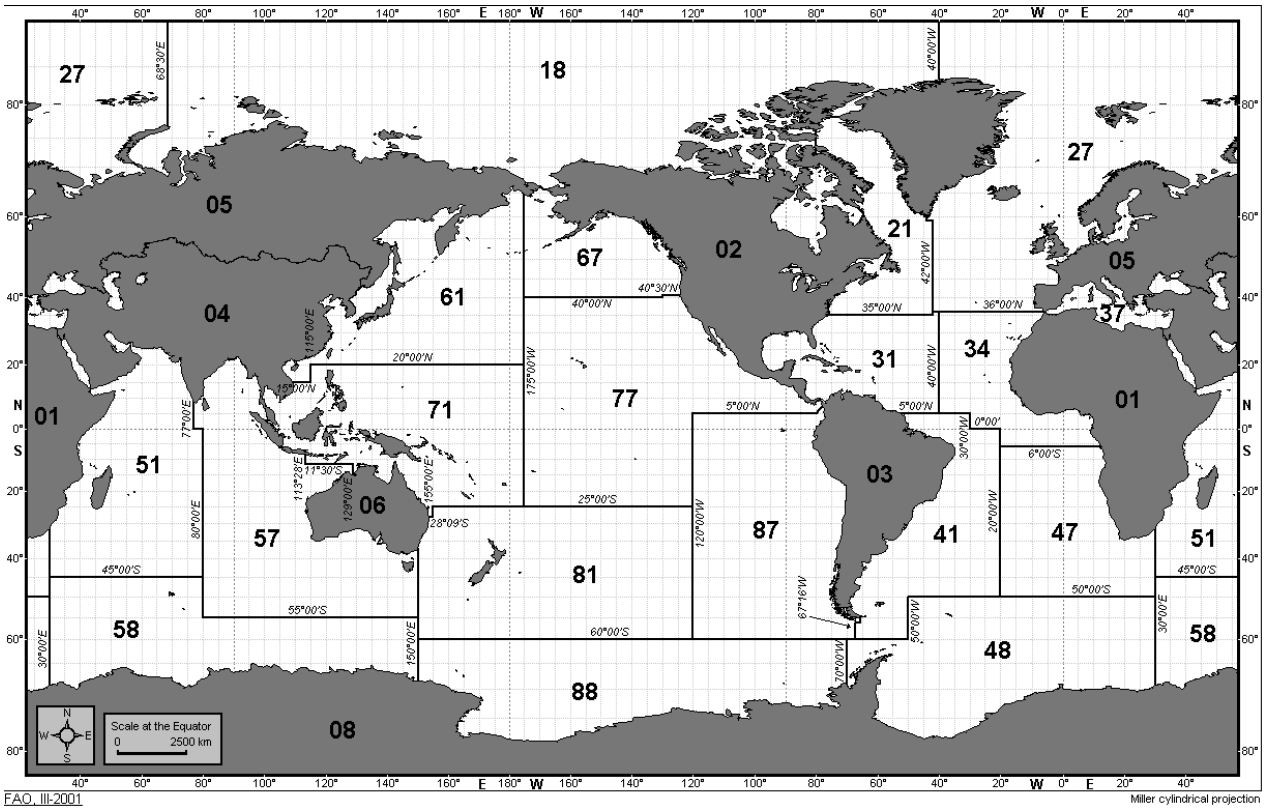
Annex 1

Map of Major Fishing Areas for Statistical Purposes



Annex 2. A Brief Review of the Largest Seafood Companies Globally by Region

ASIA[27] [28]

1. Nippon Suisan Kaisha

Company overview

Headquarters	Japan
Established	1911
Market Capitalisation (USD million)	1 825
Turnover (USD million)	4 593
Principal subsidiaries	168 (69 overseas, 109 domestic)
Number of employees	7 764 (consolidated), 1 176 (non-consolidated)

Business activities

The company is the second-largest marine products firm in Japan. Its fishing operations account for 41% of its sales. Nippon Suisan Kaisha also processes canned and frozen fish products. The company's other business segments are the production of pharmaceuticals, oils, and cold-storage services. The company owns Gorton's, a US frozen seafood company. Nippon Suisan Kaisha has operations in Canada, Chile, Denmark, Indonesia, the Netherlands, New Zealand, Singapore, Spain, Thailand, Vietnam, and the US.

Business strategies in response to the changing global business environment

"Toward Global Links": the aim of this strategy is to build a global supply chain and enhance its framework for integrated operations. The strategy also aims to create customer-oriented value from marine resources by making best use of the company's global human and other resources. The company expects to continue to aggressively invest in this area to increase the Group's value on a global scale in the future.

[27] Data provided by Glitnir-Intrafish Seafood Stockwatch, <www.glitnir.is/English/Business/Seafood/Stockwatch/>, Wright Investors' service internet homepage <www.wisi.com>, Hoovers Business Information www.hoovers.com, company web pages.

[28] All figures for 2007 unless otherwise stated.

2. China Fishery Group Limited

Company overview

Headquarters	China
Incorporated	2000
Market Capitalisation (USD million)	1 400
Turnover (USD million)	156
Principal subsidiaries	
Number of employees	1 081

Business activities

The Group's principal activities are managing and operating fishing vessels for coastal and deep sea industrial fishing as well as selling fish and other marine catches. Catches are processed onboard, which typically involves heading, gutting, roe-collecting and filleting. The fish products are then frozen, packed and delivered to various markets for sale or further processing. As at December 31, 2006, the Group operates 32 vessels and manages 27 other vessels.

Business strategies in response to the changing global business environment

To underpin sustainable growth, the company has set up the following plans; *1)* Securing more vessel operation agreements, *2)* Strategic or complementary acquisitions in Peru, *3)* Developing South Pacific operations, *4)* Optimisation of capital structure.

3. Maruha Group

Company overviewHeadquarters	Japan
Incorporated	2004
Market Capitalisation (USD million)	628
Turnover (USD million)	6 060
Principal subsidiaries	168 Companies (59 overseas, 109 domestic)
Number of employees	1 176 (non-consolidated), 7 764 (consolidated)

Business activities

As Japan's top seafood producer, Maruha gets some 75% of its sales from its marine products division. The company also provides canned, frozen, and other processed convenience foods. Meats, animal feeds, and fish by-products for use in health foods, cosmetics, and pharmaceuticals also help fill out its bottom line. The company is divided into three segments: marine products, processed foods, and storage and logistics. The Maruha Group became a holding company in 2004.

Business strategies in response to the changing global business environment

"New Wave 21": this strategy is a three-year management plan, starting in the fiscal year of 2002, with a view to moving the company from loose linkages to a more tightly knit group. The new plan starting from fiscal 2005 calls for greater all-around deepening of group management, a shift to the offensive, organic business fusion and overall group optimization. Dealing with overseas markets, triangle operation (global optimization of procurement, processing and sales) is emphasized. The group plans strategic capital investments concentrated in core business such as marine products business and processed foods business, as well as improvement in domestic and overseas productivity and further reinforcement of marketing capabilities and competitiveness.

4. Thai Union Frozen Foods Group

Company overview

Headquarters	Thailand
Incorporated	1998
Market Capitalisation (USD million)	623
Turnover (USD million)	
Principal subsidiaries	Century Union (Shanghai) Foods Co. (China); Chicken of the Sea International (U.S.A.); Empress International (U.S.A.); Thai Union Manufacturing Co; Tri-Union Seafoods LLC (U.S.A.)
Number of employees	26 043

Business activities

The Group's principal activity is the production, distribution and exportation of frozen and canned seafood products. The company is one of Thailand's largest producers frozen and canned seafood, with exports to the US, Japan, and Europe. Its main products include frozen tuna loin, frozen shrimp, frozen cephalopod, canned human food and canned pet food. The Group operates in Thailand and overseas.

Business strategies in response to the changing global business environment

The company have continued its program of international expansion and its strategy of entering into partnerships. For example, in 1996, the company moved into the U.S. canning market, forming Thai Union International Inc. The expansion of its international sales has continued to play the central role in the company's growth strategy. Thai Union has started to enter a new market, that of mainland China. In 2005, the company paid USD 4 million to acquire a 50% stake in Century Union (Shanghai) Foods Co. In this way, the company gained access to the Chinese market through Century's FMCG brand family of products.

5. Pacific Andes

Company overview

Headquarters	China
Established	1986
Market Capitalisation (USD million)	549
Turnover (USD million)	535
Principal subsidiaries	
Number of employees	6 300

Business activities

The Group's principal activities are global sourcing, processing on shore and international distribution of a variety of frozen seafood products, fuel-trading-at-sea, the provision of shipping and agency services and the cultivation, processing and supply of vegetables. The Group's operations are carried out in Mainland China, North America, Western Europe, Eastern Europe, Japan and other.

Business strategies in response to the changing global business environment

The company implemented several strategic growth plans to achieve further integration of the Group’s operations along the entire value chain. Management efforts have focused on two principal areas – on the upstream side, where PA sought to secure more long-term access to limited fishery resources and, on the downstream end, where PA embarked on enhancing processing capabilities, so as to more effectively address market trends for processed seafood. To this end, key developments undertaken by the Group in FY2007 included: 1) increased Vessel Operating Agreements to ensure long-term access to regulated fish resources. 2) Establishment of operations in Peru to capture robust global demand for fishmeal. 3) Strengthened food safety and traceability reporting systems to help the company differentiate itself from many other seafood processors in the marketplace.

6. Nichiro Corporation

Company overview

Headquarters	Japan
Established	1914
Market Capitalisation (USD million)	285
Turnover (USD million)	1 371
Principal subsidiaries	64 (consolidated) and 16 affiliates
Number of employees	5 711

Business activities

The company is Japan's third largest seafood producer (after Maruha and Nippon Suisan Kaisha). The Nichirei Group has positioned two growth areas - Processed Foods and Logistics - as the core businesses that are the focus of its efforts. The Group also has Marine Products Business, Meat and Poultry Products Business, Real Estate Business and Other Operations. In Marine Products, Nichirei imports and sells seafood procured from all around the world. Net sales compare with those of Japan's leading marine products companies, with Nichirei being especially strong in the handling of several items such as shrimp, herring roe and octopus. Nichirei is enhancing its line of value-added products that meet customers' needs, as well as handling more premium products.

Business strategies in response to the changing global business environment

The company is working on establishing a Product Meister Model as the medium term business model for the most competitive products. In this model, Nichirei will add value not only in the upstream portion of the value chain, *i.e.* procurement and development of advantages pertaining to the product itself, but also through preliminary processing, and wholesale and retail sales. Historically, Nichirei has mainly used product development and procurement as mechanisms for converting products' strong points into added value; now the corporation want to construct such mechanisms to use also in the preliminary processing, wholesale and retail sales phases to make its products more competitive.

7. Sea Horse Public Company Limited

Company overview

Headquarters	Thailand
Established	1914
Market Capitalisation (USD million)	258
Turnover (USD million)	
Principal subsidiaries	
Number of employees	201

Business activities

The Group's principal activities are the production and export of frozen and canned seafood. Products include frozen octopus, fish, mussel, shrimp, frozen shrimp, canned sardine, mackerel and squid. The Company distributes its products mainly in the overseas market. The Company operates two plants with a total production capacity of 17 200 tons of frozen seafood and 9 200 tons of canned seafood per year. Sea Horse has a subsidiary, Khon Kaen (1990) Corporation, which is engaged in the sales of frozen seafood in the northeastern region of Thailand. Frozen Seafoods accounted for 79% of 2001 revenues and 21% Canned Seafoods.

8. Kyokuyo

Company overview

Headquarters	Japan
Established	1937
Market Capitalisation (USD million)	236
Turnover (USD million)	1 288
Principal subsidiaries	13 (consolidated)
Number of employees	2 791 (consolidated), 514 (non-consolidated)

Business activities

Kyokuyo Co. engages in the export, import, and sale of marine products, as well as in the manufacture and sale of processed and frozen foods in Japan and internationally. The company has evolved from a whaling interest into a broad-market seafood purveyor. It operates in four divisions: Processed Marine Products, Cooked Frozen Food, Canned Food, and Fishery. The Processed Marine Products division processes fish and shellfish into various products including slices or materials for sushi topping. It sells its products primarily to general merchandizing stores, restaurants, and sushi chains. The Cooked Frozen Food division processes marine products and various foodstuffs into cooked frozen foods, including frozen fries. It sells its products principally to general merchandizing stores and the food service/catering industry. The Canned Food division manufactures canned foods, primarily canned sea foods, such as salmon and mackerel. The Fishery division operates four tuna purse seiners. These vessels fish oceanic bonitos and tunas in the Pacific area. In addition, the company engages in logistics operations.

Business strategies in response to the changing global business environment

The company revised its medium-term management plan ("Review of the New Medium-Term Management Plan'') to adapt to the changing operational conditions *i.e.* increases in marine prices worldwide and crude oil prices. The priority actions in this plan are; *1)* strengthening overseas operations, *2)* expanding sales of sushi materials and other food materials eaten raw, *3)* bolstering bonito and tuna operations, *4)* improving product development capability and 5) quick turnover of inventory. With regard to strengthening overseas operations, the company will increase the volume of goods processed overseas, by developing distinctive new products with added value, increasing sales, and upgrading and expanding overseas purchasing bases. At the same time, the company will increase sales and stabilize revenue by aggressively managing operations such as export and tripartite trade.

9. Uoriki Co

Company overview

Headquarters	Japan
Established	1984
Market Capitalisation (USD million)	171
Turnover (USD million)	
Principal subsidiaries	
Number of employees	416

Business activities

The Company's principal activity is to sell fish and seafood. The Company is an in-store retailer of fresh fish, processed seafood products, frozen products, salt-cured products and 'Sushi'. The products are sold mainly through department stores, station buildings, supermarkets and tenant buildings. The Company operates in four segments: Fresh fish, Sushi, Wholesale operations and Restaurants.

10. Chuo Gyorui Co

Company overview

Headquarters	Japan
Established	
Market Capitalisation (USD millions)	135
Turnover (USD millions)	1 315
Principal subsidiaries	
Number of employees	582

Business activities

The company is Japan's third largest seafood producer (after Maruha and Nippon Suisan Kaisha). The Nichirei Group has positioned two growth areas - Processed Foods and Logistics - as the core businesses that are the focus of its efforts. The Group also has Marine Products Business, Meat and Poultry Products Business, Real Estate Business and Other Operations. In Marine Products, Nichirei imports and sells seafood procured from all around the world. Net sales compare with those of Japan's leading marine products companies, with Nichirei being especially strong in the handling of several items such as shrimp, herring roe and octopus. Nichirei is enhancing its line of value-added products that meet customers' needs, as well as handling more premium products.

AMERICAS

1. Connor Bros. Income Fund

Company overview

Headquarters	Canada
Established	1911
Market Capitalisation (USD million)	549
Turnover (USD million)	808.6
Principal subsidiaries	
Number of employees	

Business activities

Connors Bros. Income Fund is an unincorporated open-ended trust established under the laws of the Province of Ontario that indirectly holds, through its subsidiaries, a majority position in two operating companies. The operating companies are Clover Leaf Seafoods, L.P. and Bumble Bee Foods. LLC. Clover Leaf produces and sells canned and refrigerated seafood domestically and internationally. Bumble Bee produces and sells canned seafood and canned protein products in the United States. Together, these two operating companies comprise North America's largest branded seafood company, offering a full line of canned tuna, salmon, sardine, clam, and specialty products, marketed under leading brands including Clover Leaf®, Bumble Bee®, Brunswick®, Snow's®, and Beach Cliff®. Additionally, Bumble Bee offers a wide variety of canned chicken and canned meat products in the United States under leading brands including Castleberry's®, Sweet Sue®, and Bryan®.***Business strategies in response to the changing global business environment***

The company is committed through profitable, organic growth and synergistic acquisitions to meet the needs of consumers, business partners, and unit holders. The company intends to build on its core competencies to ultimately become a leader in three areas: 1) canned seafood and protein products in North America, 2) canned seafood in Europe and other profitable global markets and 3) fresh and frozen seafood in North America.

2. Copeinca

Company overview

Headquarters	Peru
Established	1994
Market Capitalisation (USD millions)	400
Turnover (USD millions)	89.9
Principal subsidiaries	Copeinca International S.L (marketing and sales); Copeinca ASA Norway (holding company)
Number of employees	1 760

Business activities

Copeinca is engaged in the extraction of anchovy and production of fishmeal of anchovy and production of fishmeal and fish oil. The company is the second largest fish player in and controls 8.4% of Peruvian fleet capacity (52 vessels). The company was the fourth largest fishmeal company in Peru on 29th January, 2007: 8.9% of Peruvian plant capacity (7 processing plants).

Business strategies in response to the changing global business environment

The company has continued to be active in the consolidation process.

3. Sociedad Pesquera Coloso

Company overview

Headquarters	Chile
Established	
Market Capitalisation (USD millions)	356
Turnover (USD millions)	174.18
Principal subsidiaries	
Number of employees	731

Business activities

The Group's principal activities are manufacturing, producing and exporting canned fish such as sardines, pilchards, salmon and fish fillet; frozen products such as scallops, frozen fish and surimi and feed products such as fish meal, fish oil and solid fish oil. It operates 3 plants in Coquimbo in the north, Talcahuano and Coronel in the south.

4. Pesquera Itata

Company overview

Headquarters	Chile
Established	1948
Market Capitalisation (USD millions)	354
Turnover (USD millions)	112.83
Principal subsidiaries	
Number of employees	426

Business activities

The Group's principal activity is producing fish flour and fish oil. Its plants are located in the port of San Vicente and in Caldera belonging to its subsidiary Pesquera Atacama SA. It produces canned sardines and dried salted anchovies and pioneered the fishmeal industry in Chile by importing the first fishmeal plant into the country. It owns a fleet of 13 vessels.

5. Invertec Pesquera (Invermar)

Company overview

Headquarters	Chile
Established	
Market Capitalisation (USD millions)	266
Turnover (USD millions)	80.9
Principal subsidiaries	
Number of employees	

6. Pesquera Iquique-Guanaye (Igemar)

Company overview

Headquarters	Chile
Established	1911
Market Capitalisation (USD millions)	249
Turnover (USD millions)	
Principal subsidiaries	
Number of employees	

7. Clearwater Seafoods Income Fund

Company overview

Headquarters	Canada
Established	1976 (Clearwater Seafoods Limited)
Market Capitalisation (USD millions)	257
Turnover (USD millions)	271.55
Principal subsidiaries	
Number of employees	1 300

Business activities

Clearwater Seafoods Income Fund is an unincorporated open-ended trust established under the laws of the Province of Ontario, which has been created to hold, indirectly, partnership units of Clearwater Seafoods Limited Partnership (CSLP), which, is a vertically integrated fishing business. Clearwater harvests, processes and markets more than 40 000 tons of seafood. The operations consists of harvesting premium shellfish in the offshore fisheries of Atlantic Canada and Argentina; processing shellfish onboard technologically advanced factory vessels or in modern shore-based processing plants and marketing and distributing premium shellfish to over 1 300 customers in North America, Europe and Asia.

8. Fishery Products International (FPI)

Company overview

Headquarters	Canada
Established	
Market Capitalisation (USD millions)	179
Turnover (USD millions)	648.96
Principal subsidiaries	
Number of employees	

Business activities

Fishery Products International is a company in harvesting, processing, global sourcing, and markets a wide selection of high quality seafood products. From its corporate headquarters in Newfoundland, FPI manages primary and value-added seafood processing plants and a fleet of modern harvesting vessels. FPI is committed to delivering the highest quality seafood to its customers worldwide, developing international markets for fine seafood products. Within North America, FPI is the leading supplier of seafood to the foodservice, retail and warehouse club markets. The products are marketed under brands such as UpperCrust®, Mirabel®, FPI®, Luxury®, and Acadian Supreme®.***Business strategies in response to the changing global business environment***

FPI seeks to establish strategic harvesting and processing relationships coupled with an extensive network of global supply specialists to offer a wide selection of seafood products, from finfish to shellfish in both commodity and value-added segments.

9. Omega Protein Corp

Company overview

Headquarters	USA
Established	1878
Market Capitalisation (USD millions)	136
Turnover (USD millions)	139.8 (2006)
Principal subsidiaries	
Number of employees	1 048

Business activities

The Group's principal activities are to produce and market variety of protein and oil products derived from menhaden. Menhaden is a species of herring-like fish found along the Gulf of Mexico and Atlantic coasts. The products includes fish meal, fish oil and fish solubles. Fish oil is utilized for animal and aquaculture feeds, industrial applications, and additives to human food products. The products of the Group are primarily sold in the United States, Mexican, European and Canadian markets. The Group's products are sold directly and also through independent sales agents.

10. High Liner Foods

Company overview

Headquarters	Canada
Established	
Market Capitalisation (USD millions)	92
Turnover (USD millions)	224.4
Principal subsidiaries	
Number of employees	628

Business activities

The Group's principal activities are to process and market frozen seafood products in North America. It markets its products under the High Liner® and Fisher Boy® brands to major retail chain stores, restaurants and institutions for food service throughout the United States, Canada and Mexico. The Group is also a major supplier of private label processed seafood products to North American food retailers and food service distributors.

Business strategies in response to the changing global business environment

The Company will seek future acquisitions of complementary businesses to expand its product portfolio and strengthen its market leadership position. In addition to this strategy, the Company seeks to strengthen brands, to strengthen the organisation, and to grow through innovation.

EUROPE

1. Marine Harvest

Company overview

Headquarters	Norway
Established	2006 (merged)
Market Capitalisation (USD millions)	3 676
Turnover (USD millions)	840.27
Principal subsidiaries	
Number of employees	3 935

Business activities

As of 29 December 2006, the three former groups of Pan Fish Group, Fjord Seafood Group and Marine Harvest N.V. Group, were integrated into Marine Harvest. The Group's principal activities are farming, processing, sale and distribution of salmon, trout and related products. Marine Harvest is the world's largest aquaculture company with a global market share of almost 30% for salmon and trout. With its 9000 employees the company operates in 20 countries (including in Norway, the United Kingdom, the Faeroe Islands, the United States, Canada, Denmark, France and Japan) and maintains a presence in all the regions where salmon is harvested. Products processed by the Group are fillets, smoked salmon, brine-cured salmon, skinless and boneless portions for institutional kitchens and pre-packaged servings in supermarkets.

Business strategies in response to the changing global business environment

The Company expects that the direct contact between fully integrated company and the professional and very demanding distribution systems will be a crucial element for the future growth. The company seeks to establish new product varieties to expand the category within the retail sector and food services. At the same time, the Company seeks to develop retail and food services in new markets to promote its products to new consumers, thus increasing demand.

191.

2. Austevoll Seafood

Company overview

Headquarters	Norway
Established	1981 (incorporated)
Market Capitalisation (USD millions)	1 587
Turnover (USD millions)	471.03
Principal subsidiaries	The Group acquired Rong Laks in 2005 and Fiordo Auistral, Eidane Smolt AS, Welcon AS and Austral Group S.A.A. in 2006.
Number of employees	2 389

Business activities

The Group's principal activities are in pelagic fishing, fish meal/oil production, processing of fish for human consumption, sale of fish products and salmon farming. The three divisions of the Group are Human Consumption, Salmon and Fish Meal/Oil. The Group operates fishing fleets, fish meal plants, canning plants, modern packing plants, salmon farming and sales units to ensure high level of freshness in its catch - from fishing waters to finished products. The Group operates in Peru, Chile and Norway.

Business strategies in response to the changing global business environment

The Company emphasis the following factors: 1) Globalisation - Among the largest harvesting companies, with strong positions in Peru, Chile and Norway; 2) Integration – From fishing to end product, the company seek to solidify its strong position in the value chain; 3) Innovation – For 25 year, the company has been actively integrating other companies into its operation to create new niches and competitive advantages; 4) Quality – Creating top quality products; 5) Technology – With a modern fleet of fishing vessels and production facilities, the company is able to produce efficiently and effectively.

3. Cermaq ASA

Company overview

Headquarters	Norway
Established	1995
Market Capitalisation (USD million)	1 570
Turnover (USD million)	791.1 (2005)
Principal subsidiaries	
Number of employees	3 937

Business activities

The Group's principal activity includes the production of salmonid feed, farming salmon and trout, and research in aquaculture. The Group operates in three business segments: Fish Feed, Fish Farming and Agriculture. Fish Feed involves the production of fish feed and the processing of by-products from the fish farming industry. Fish farming involves the on-growing of salmon and trout from smolts, as well as the slaughtering, processing, sale and distribution of salmon and trout. The Group operates through subsidiaries in Norway, Scotland, Canada and Chile. In 2006, the Group acquired Langfjordlaks AS.

Business strategies in response to the changing global business environment

The Company emphasize the following factors: 1) Cermaq will be a leading global supplier of feed for salmon and trout, with a complete product range and with operations in all four main salmon producing regions of the world; 2) Cermaq will be a significant player in the farming of salmonid species in the two main farming regions, Norway and Chile; 3) Cermaq will be among the best players in research and development in fish feed and salmon farming and 4) Cermaq will maintain a strong operational focus as a basis for success and future growth.

Business strategies in response to the changing global business environment

Lerøy Seafood Group’s vision is to be the leading, most profitable Norwegian supplier of seafood. To achieve this, the company will focus particularly on the following: 1) Alliances: Businesses in the network must have good opportunities to focus on own core activities and to capitalise on economies of scale and reduced risks. Constantly improve the Group’s core operations including the development of long-term and committed alliances with both suppliers and customers. 2) Market orientation: Emphasising market orientation and forward-looking solutions that will ensure profitability. 3) Quality: Cooperating with and being among the leading companies within product development and quality assurance to ensure customer satisfaction and thus also profitability. 4) Risk management: Continuing to develop systems for identifying risks in order to avoid an imbalance between commercial risks and the requirement for profitability. The Group’s risk profile and its strategies for value generation shall be coordinated with the Group’s available resources. 5) Know-how: Profitable growth requires improved competence in the fields of management, operations, development of incentive systems, financial management, exploitation of new technology, product and market knowledge and systematic marketing. 6) Strategic business development: The Group has for many years made significant acquisitions. Strategic business development is also of decisive importance in the continued development of the Group. The acquisition of Vestar Holding AS in March 2007, contributes significantly to the Group’s strategic business development.

4. Lerøy Seafood Group

Company overview

Headquarters	Norway
Established	1899
Market Capitalisation (USD million)	1 091
Turnover (USD million)	834 (2006)
Principal subsidiaries	Norway, Sweden, France and Portugal (7 sales and 8 production companies).
Number of employees	1 562

Business activities

The Group's principal activity is marketing and distribution of seafood. The Group operates through two segments namely: Sales & Distribution and Production. The products of the Group include whole salmon, processed salmon, whitefish, salmontrout, shellfish and pelagic. The Group has operations in Norway, Western Europe, Asia, the United States, Canada, Eastern Europe and other Countries.

5. Biomar Holding

Company overview

Headquarters	Denmark
Established	1962
Market Capitalisation (USD million)	650
Turnover (USD million)	521 (2006)
Principal subsidiaries	
Number of employees	497

Business activities

BioMar Holding A/S formerly known as BioMar A/S. The Company's principal activities are the development, production and distribution of fish feed. The Group operates through its fully owned subsidiaries in Norway, the United Kingdom, Chile, Denmark, France and Greece. Its primary markets are Europe, Chile and some Asian countries. The Group`s products can be divided into four specific segments; Ecoline (focus on ecology and environment); Bio-Optimal (focus on the health of the fish); Aquavet (feed-coated pharmaceuticals) and Aqualife (focus on a good diet). The BioMar group supplies feed to around 50 countries and for over 25 different fish species, which in addition to the above include organic salmon, organic cod, cod, eel, turbot, halibut and sturgeon.

Business strategies in response to the changing global business environment

"Going for Global Growth": to create healthy and sustainable growth for customers and shareholders, the Company set the future development strategy. It is a two step strategy: The first step is building the foundation for growth. A new regional organization close to the market-place has been implemented. It has operational responsibility in order for the management to make speedier decisions. Furthermore the group is in the process of increasing dedicated functional expertise within areas such as Business Development, R&D, manufacturing excellence and sourcing. The second step is putting increased focus and resources to business development and R&D in order to enhance competitiveness of the BioMar and unleashing the growth potential of the BioMar Group.

6. Pescanova

Company overview

Headquarters	Spain
Established	1960
Market Capitalisation (USD million)	580
Turnover (USD million)	
Principal subsidiaries	
Number of employees	4 519

Business activities

The Group's principal activities are fishing, processing, distribution and marketing of fish products for human and animal consumption. The Group operates as a vertical company, processing all stages from fishing to marketing the final product. It has a fleet of about 120 fishing vessels.

7. Alfesca

Company overview

Headquarters	Iceland
Established	
Market Capitalisation (USD million)	472
Turnover (USD million)	696.1 (2005)
Principal subsidiaries	The Group has 11 production facilities in France, Spain and the UK and operates under the Labeyrie, Blini, Lyons, Delpierre, Skandia and Farne brands.
Number of employees	497

Business activities

The Group's principal activity is the production of seafood and regional specialty products, such as salted fish, smoked seafood, regional duck products, foie gras, shellfish, prawns, blini, spreadables, snacks and other ready-to-eat products. Its products are sold worldwide under its own brand names including Labeyrie, Blini, Delpierre, Lyons Seafoods and Skandia, but it also has presence in private labels in some of its markets.

Business strategies in response to the changing global business environment

Alfesca intends to drive forward its business through organic growth, underpinned by rigorous production efficiency and by actively seeking acquisition and investment opportunities that will strengthen its business in a dynamic and profitable manner. Alfesca's strategy is focused on increasing the sales of its products, both under its own brands and as retailer-branded products, within the four pillars of its business through innovation and by being alive to new trends in food consumption in Europe. The choice of the four pillars of product lines is with a view to reduce seasonality and exposure to raw material price fluctuation.

8. Aker Seafoods

Company overview

Headquarters	Norway
Established	2005 [as a merger between Norway Seafoods (a subsidiary of Aker), West Fish-Aarsæther and Nordic Sea Holding.]
Market Capitalisation (USD million)	353
Turnover (USD million)	322 (2006)
Principal subsidiaries	Norway, Denmark and Sweden
Number of employees	1 167

Business activities

The Group's principal activity is harvesting, processing and the distribution of sea fish and related products. Harvesting activity is carried out in Norway and mainly contains harvesting of cod, saithe and haddock. The Company has nine fresh-fish trawlers, five freezer trawlers and one combined fresh-fish/freezer trawler. The processing activity is carried out in Norway and Denmark (under the brand Thorfisk), mainly consist of fresh and frozen fillet of cod, saithe, haddock, salmon and plaice processing. Sales and distribution division contains Nordic Group, which operates as a separate trading entity and exports fresh and frozen white fish products.

Business strategies in response to the changing global business environment

Aker Seafoods is in the process of implementing a new market strategy to secure the best possible position in a whitefish market characterised by positive progress. The aim is to become even more a leading provider of fresh and high-value frozen consumer-packed products under Aker Seafoods' own local brands in some of its principal markets, with Thorfisk as a brand in Denmark and Aker Seafoods in Norway and Sweden. Combined with growing deliveries to private labels for the retail chains, this will provide a higher level of processing and increase value creation.

9. Icelandic Group

Company overview

Headquarters	Iceland
Established	1942
Market Capitalisation (USD million)	309
Turnover (USD million)	1 520 (2005)
Principal subsidiaries	15 group companies including Coldwater Seafoods, Pickenpack, Fiskval, Seachill and Icelandic, operating in several countries.
Number of employees	4 638

Business activities

The Group's principal activities are the production and sale of frozen, chilled or fresh seafood products such as whitefish, shrimp, shellfish and molluscs of various kinds. Other activities include procurement, supplies and food services. It operates through an international network of independent companies in Iceland, Norway, Netherlands, China, Thailand, South Korea, United States, United Kingdom, France, Denmark, Germany, France, Spain and Japan. The Group acquired Jeka Fish and Delpierre's Gelmer during 2006.

Business strategies in response to the changing global business environment

Icelandic Group is an international network of companies, each operating in its own market in the processing and marketing of seafood. Up until 2006, Icelandic Group companies have operated as completely independent units, with practically negligible synergies and co-operation in purchasing, marketing and operation of support divisions. The restructuring currently underway is aimed at taking increasing advantage of the Group’s strength and size to achieve more favourable purchasing, increase the cost efficiency of support divisions and thereby improve performance. The company has also set five-year operating targets, anticipating a substantial increase in both the scope and profitability of its activities. In the near term, consolidation is expected of companies processing and marketing seafood products.

10. Nirefs (Nireus)

Company overview

Headquarters	Greece
Established	1988
Market Capitalisation (USD million)	292
Turnover (USD million)	191 (2006)
Principal subsidiaries	
Number of employees	

Business strategies in response to the changing global business environment

The Company's major management goals are as follows: *1)* to remain an international forerunner in the aquaculture sector and further strengthen its leading position; *2)* to place special emphasis on the vertical integration of its production and achieve added value; *3)* to increase productivity-performance, to the benefit of its shareholders; *4)* to respect the environment; *5)* to establish a long-term horizon for its consumers, shareholders and work force, through the setting up of a strategic plan and long-term goals; *6)* to successfully face challenges and demands both in the domestic and international markets and *7)* to achieve transparency in the structure, operations and production for both the Company and the Group.

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TRADE AND AGRICULTURE DIRECTORATE
FISHERIES COMMITTEE

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FISHERIES SERVICES: OVERVIEW OF QUESTIONNAIRE RESULTS AND POLICY IMPLICATIONS

This document is submitted for DISCUSSION and COMMENTS to the 100th Session of the Committee for Fisheries, 29-31 October 2007, under agenda item 8. 4).

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English - Or. English

FISHERIES SERVICES: OVERVIEW OF QUESTIONNAIRE RESULTS AND POLICY IMPLICATIONS

Introduction

1. Interest in fisheries services in the context of globalisation stems from the potential economic benefits that further liberalisation of trade in fisheries services could generate. As with trade in goods, comparative advantages also exist among the different suppliers of services. Further specialisation through liberalisation of trade and cross border provision of services is wealth creating. For the fishing industry it is important to have ready access to services at competitive prices.

2. At the multilateral level, services have received increasing attention in the last decade. The adoption of the WTO General Agreement on Trade in Services (GATS) under the Uruguay Round started a new multilateral discipline for services. Insofar as statistics are concerned, and recognising the increased economic importance of trade in services, cooperative work is on-going between the UN, EU, IMF, OECD, UNCTAD and WTO on statistical methodologies etc. for statistics on trade in services; these organisations have recently issued a "Manual on Statistics of International Trade in Services" (2002). When it comes to defining services both the GATS and the Manual offer some potential (Box 1).

3. The purpose of the Committee for Fisheries work on services is to bring greater transparency to the issues surrounding services and the fishing industry. The work was initiated by the Committee's interest in globalisation and in recognition of the fact that analysis of services to the fishing industry has not received sufficient attention.

4. During the work on this paper it transpired that analysis of fishing services is an area where sparse information is available. While the present document looks at services and the fishing industry a companion paper focuses on access to ports and port services. That area of investigation has been singled out as particularly important as it has linkages to the trading system, to efforts to curb IUU fishing and because the fish harvesting sector are faced with some particular globalisation challenges and opportunities.

Services Provided to the Fishing Industry

5. Besides the Committee's work related to fisheries subsidies and fisheries management costs[1], very little attention has been given to the area of services to the fishing industry. Examples of the type of services that the fishing industry uses shows that a wide variety of services are in use and that important amounts of money are involved. The country inventory [TAD/FI(2007)11/PART1] suggests that all OECD countries have a long list of services provided to the industry.

[1] See for example "*The Costs of Managing Fisheries*", OECD 2003.

Box 1. Two Definitions of Trade in Services

GATS article 1 defines trade in services in the following way:

For the purposes of this Agreement, trade in services is defined as the supply of a service:

(a) from the territory of one Member into the territory of any other Member;
(b) in the territory of one Member to the service consumer of any other Member;
(c) by a service supplier of one Member, through commercial presence in the territory of any other Member;
(d) by a service supplier of one Member, through presence of natural persons of a Member in the territory of any other Member.

The "*Manual on Statistics of International Trade in Services*" (2002) by the UN, EU, IMF, OECD, UNCTAD and WTO on statistical methodologies etc. for statistics on trade in services offer the following definition:

The term '*services'* covers a heterogeneous range of intangible products and activities that are difficult to encapsulate within a simple definition. Services are also often difficult to separate from goods with which they may be associated in varying degrees.

The present *Manual* generally respects the 1993 System of National Accounts use of the term *services*, which is defined as follows:

"Services are not separate entities over which ownership rights can be established. They cannot be traded separately from their production. Services are heterogeneous outputs produced to order and typically consist of changes in the condition of the consuming units realised by the activities of the producers at the demand of the customers. By the time their production is completed they must have been provided to the consumers."

6. Services to the fishing industry are provided by both public authorities and through private markets, or a combination of both. Across countries there may be a different mix of who (private firms or public authorities) provide the service to the various value chain elements. For example, in some countries veterinary services are provided by public authorities (with or without cost recovery), while in other countries such services are uniquely provided by private firms. Also, some services are in place for regulatory reasons (*e.g.* HACCP certification, fisheries management and surveillance) while other services are required by the value chain to be able to function.

7. Along the value chain the type of services that are in demand also differ. For example, while the harvesting sector demands fisheries management services, other value chain elements may benefit from this service. As one moves along the value chain the mix of providers (public vs. private) changes. At the harvesting sector level it is the public authorities that provide most services (management, research, surveillance and control) while at the retail level service provision is mostly by private enterprises.

8. Services increase the costs of fishing industry operations unless they are provided free of charge by public authorities. A number of policy relevant issues should therefore be addressed in the provision of services to the fishing sector, including:

- Public or private provision of the service.
- Domestic or foreign provision of the service.

- Are the services demanded by the industry itself or imposed for regulatory reasons
- If provided by the public is there a cost recovery scheme in place
- Are the same services provided free of charge by public authorities across countries? If not, do some countries' industries have a competitive advantage in not having to pay for the services while others do, potentially leading to an implicit subsidy?
- Does the regulatory environment restrict access to use foreign services? And/or do the regulatory environment restrict it to a limited number of service providers?
- What are the restrictions on foreigners to access the services market (i.e. can the service be exported)?

Why liberalise services to the fishing industry

9. A number of reasons can be advanced for the liberalisation of services across borders. In addition to general welfare gains that are generated by sourcing services from the least cost producer, trade in services can reduce costs of technology transfer and increase exposure to foreign technologies[2]. The fishing sector is no different in this respect. The general work on service liberalisation by the OECD Trade and Agriculture Directorate suggests that the gains from more open service trade are substantially greater than the potential gains emanating from liberalising trade in goods. Also, because services are a major part of the economy (services account for about 70% of GDP in high income OECD countries), liberalising the services sector is likely to have an important growth effect. Another important effect of services liberalisation relates to additional skills and technology that the receiving country would benefit from. Further liberalisation of services would reduce costs of production, and ultimately prices to consumers, and hence increase welfare.

Questionnaire

10. At its 98th session, the Committee for Fisheries agreed to issue a questionnaire on services provided to the fishing industry. The purpose of this exercise was to obtain a better understanding of how services are provided to the fishing industry (with an emphasis on the harvesting sector). Five questions were identified by the Committee as relevant to the exercise:

1. Please provide information on the extent to which services to the fishing industry are provided by the public or private sector. If the service is provided by public authorities, please state whether there is a cost recovery scheme in place, or how the service is paid for.
2. Is the provision of services regulated? If the provision of the service is restricted, on what grounds? (*e.g.* environment, management, conservation, security). Are regulations and restrictions published? Are domestic and foreign users treated equally?
3. Is the service provided as a regulatory obligation?
4. When considering a service provider, can the user freely choose between domestic or foreign providers?

[2] See for example "*The Linkages between Open Services Markets and Technology Transfer*", OECD Trade Policy Working Paper No 29 by Sebastian Mirodot.

5. Is the regulatory environment for the provision of a service (or a series of services) an outcome of internationally agreed measures (*e.g.* Codex Alimentarius, RFMO provisions, multilateral environmental agreements)?

Questionnaire Returns

11. This paper has been drafted on the basis of questionnaires returned from the following countries: Australia, Belgium, Canada, Czech Republic, Finland, France, Germany, Japan, Korea, Iceland, Netherlands, New Zealand, Portugal, Slovak Republic, Spain, Sweden, Turkey, United States, Argentina, Chinese Taipei and Thailand.

12. It is also worth noting that the EU has recently adopted Directive (2006/123/EC of 12 December 2006) on services in the internal market. The objective of the Directive is to eliminate barriers to the free movement of services within the EU and thus strengthen further economic integration. Among others, the preamble notes that (3) "The barriers affect a wide variety of service activities across all stages of the provider's activity and have a number of common features, including the fact that they often arise for administrative burdens, the legal uncertainty associated with cross-border activity and the lack of mutual trust between Member States". The effect on the provision of services to the fisheries sector in the EU of the adoption of this directive is, as yet, unknown.

Harvesting

13. Based on the questionnaire returns, in one group of countries, public provision of harvesting services is generally free (Finland, Sweden, Turkey and France). Another group has either a cost recovery scheme in place or the provision of services (the most frequently cited example is that of veterinary services) is left to private service providers (*e.g.* New Zealand, Australia, USA, Spain and the Netherlands). The types of harvesting services where cost recovery is not generally in place are for surveillance and enforcement, TAC and quota administration, and training.

14. Some countries report that a "first hand/auction sale tax/levy" is in place to finance management costs. An interesting exception to TAC and quota administration cost recovery is in New Zealand, where this service is devolved and paid for directly by the industry. In New Zealand, the levy on landings is channelled into the NZ Seafood Industry Council, an industry-owned body that administers the many registry and administrative functions of the quota management system. In Australia, costs of the management are split between the industry and the public; attributable costs (for example, licensing, compliance, data collection, satellite monitoring, and the costs of management advisory committees) are recovered from the industry through levies and licence fees. In Canada the costs of observer programmes are split between the industry and public; the Department of Fisheries and Oceans covers 30 per cent and the industry the remainder.

15. In Germany the role of the Länder as a service provider is important and includes a role in fisheries monitoring, data collection, research, training and veterinary services. Some of the services are provided as a shared responsibility between the Federal Government and the Länder while other services are uniquely in the hands of the local Länder administration. Most services are provided free of charge.

Aquaculture

16. In the aquaculture sector, most services are provided by private operators, or (as is mostly the case for veterinary services) are provided by public authorities, but on a cost share/recovery basis. An exception to this is the area of research, but the very broad definition of what is included (e.g. the development of brood stock is cost recovered in the USA) makes it difficult to provide definite indications

as to how much is actually provided by public coffers or paid for by private entrepreneurs. On balance the questionnaire returns suggests that research is covered by the public.

17. An interesting action is reported by Australia, where management of the aquaculture sector is devolved to states and territories. Regulations and legislation varies between the states and territories. To help address the varying levels of management in the aquaculture sector, the Aquaculture Industry Action Agenda (AIAA) - a strategic framework between industry and the Australian Government - includes an initiative to promote a regulatory and business environment that supports aquaculture. A study by the Productivity Commission assessed the environmental regulatory arrangements for aquaculture and concluded that the industry was subject to an unnecessarily complex array of legislation and agencies. Responding to the Productivity Commission findings, the Government led the development of a best practice framework of regulatory arrangements for aquaculture in Australia, which came into effect in April 2005.

18. In Iceland, all services provided to the aquaculture sector by public authorities must be paid for by the industry. The veterinary authority follows an official "rate list" where the costs for services depend on the size of the aquaculture operation. In the Netherlands, services are provided by a mix of public authorities and private enterprises; as for veterinary services these are fully cost recovered.

19. An exception to the general observation that services to the aquaculture sector are provided by private enterprises is Korea; here services to the aquaculture are provided by the public authorities with no cost recovery scheme in place.

Processing, distribution and retailing

20. Services provided by public authorities to the processing, distribution and retailing parts of the value chain are largely focussed on food security, environmental and labour issues i.e. ensuring that fish products are suitable for consumption, that waste and water discharges is limited and labour codes are observed. There is some prevalence for part- or full-cost recovery from these value chain elements. Most other services to processing, distribution and retailing (with the exception of general infrastructure and electricity and water) are provided by private service providers.

Preliminary Conclusions

21. The questionnaire returns make it possible to deduce the following broad conclusions regarding services provided to the fisheries value chain.

Regulated services

22. In addition to ensuring food safety, regulated services relate mostly to the harvesting sector and in particular those services that involve surveillance (*e.g.* observer programmes), enforcement and fisheries management and administration. Some countries restrict research to nationals. In addition to fisheries management, policy areas where services that have a public interest angle (e.g. environmental protection, food safety, labour standards, ensuring public "health") are regulated. In cases where major financial commitments are at stake for the public coffers (biological research for management purposes), the service provision is also regulated.

Domestic vs foreign supply

23. The information submitted does not allow for an in-depth assessment regarding how much service provision is provided by foreign supplier. Most management-related services relating to harvesting are primarily provided by domestic public authorities (or subcontracted out to national companies to ensure

oversight and accountability). Furthermore, while many services (*e.g.* veterinary services, training) are in principle "tradable", knowledge about specific national rules and market structure may be a distinct advantage for national service providers. The information collected does not allow an assessment as to what extent foreign suppliers are operating in national markets through equity/ownership arrangements.

Regulatory environment

24. Regulatory requirements as enumerated through international agreements and arrangements are numerous in the fisheries sector. UNCLOS, the UN Fish Stocks Agreement, FAO Compliance Agreement, and the Code of Conduct for Responsible Fisheries all include standards and objectives for fisheries and aquaculture activities. RFMOs add additional provisions (*e.g.* catch certifications schemes, traceability, data collection). Collectively, these requirements are in place to ensure responsible and sustainable fisheries. However, they also impose certain services on the industry. These relate in particular to stock assessments (biological and marine research), data gathering (landings, IUU, catch documentation), vessel registers and observer programmes (vessel monitoring systems) and veterinary services (Codex Alimentarius and World Organisation for Animal Health (OIE)) that, subsequent to their formulation, were incorporated into domestic legislation. As mentioned above across countries it differs if those costs are partly or fully paid by industry.

Cost recovery

25. As a general observation, the majority of free services are provided to the harvesting sector. Generally, in aquaculture costs of public services are recovered. Further along the value chain, services are increasingly provided by private operators. If provided by the public, direct cost recovery (or cost sharing arrangement) is more frequent in processing/trading/retailing than in harvesting (where a flat rate levy on value of landings or licence fees are frequent). Some countries make a distinction between services that are provided by the public (and eventually cost recovered), services that have been outsourced to private companies by the regulatory authority, and wholly privately-initiated service provision.

Harvesting as a service

26. A particularly contentious aspect of the discussion on fisheries services is the extent to which harvesting services constitute a service within the definition of GATS or the internationally agreed standards for the production of national accounts. A harvesting service can be defined as the situation where a vessel (and crew) from one country is employed by a company in another country to harvest catch against the company's quota (or effort allocation). Crucially, no change in beneficial ownership of the quota being fished occurs and the foreign vessel is employed to undertake a service on a temporary basis in much the same way, for example, that foreign financial or architectural companies are used to provide services to domestic clients. In principle, therefore, it is likely that harvesting services can be regarded as a service under category 4 of the GATS, as well as under the definition of services in the system of national accounts.

27. A number of OECD countries opt for importing foreign vessels and crew to fish resources within their 200 miles EEZ. The economic rationale for doing this centres on the objective of companies to maximise profits, and increase efficiency, in their operations. Sourcing harvesting services from foreign suppliers can be particularly attractive in cases where:

- There are seasonal fluctuations in fish stocks which increase the costs of having a standing fleet being kept idle for parts of the year (*i.e.* using "swing" capacity);

- The foreign vessels have a comparative advantage in harvesting (*e.g.* better techniques, lower costs);

- There is easier market access for fish harvested by the flag vessel (*e.g.* the vessel is flagged to countries with preferential market access); and

- Government financial transfers to the flag vessel which reduces their costs of operation.

28. Both Canada and Portugal allow the chartering of foreign vessels under certain conditions. New Zealand has an established charter system of foreign vessels under which New Zealand commercial fishers - through vessel charter arrangements - can employ foreign flagged fishing vessels to harvest fish. To do so, consent is required from the Ministry of Fisheries and the vessel must be registered.[3] The experience with the New Zealand charter system shows that foreign vessels chartered to harvest part of the New Zealand quota are large vessels (+30 meters in length, jiggers or trawlers) and concentrated in particular fisheries (*e.g.* squid), where seasonality is a characteristic of the fishery.

29. There are a number of policy challenges involved in the extended use of harvesting services as a result of the general trend towards the increased liberalisation of the trade in services. On one hand, policy makers need to provide the harvesting sector with a model enabling it to harness the potential benefits from globalisation and the further liberalisation of fisheries services may contribute to this objective. Using foreign harvesting services is one means of improving the flexibility of a fishing company's operations, allowing it to increase profits with economy wide effects. On the other hand, it is imperative that the resources are managed in a sustainable and responsible way and that there is adequate social and safety protection for fishers. Concerns over the impact of using foreign vessels operating in a country's EEZ must be adequately addressed through the governance arrangements for those vessels. The example of New Zealand demonstrates that appropriate institutional frameworks can be developed to safeguard against the risks while reaping the benefits from harvesting services.

[3] Also in New Zealand, overseas persons may own quota shares and annual catch entitlements, but they must first obtain consent from the Government.

EC Seminar on the Economic Dimensions of European Fisheries: Making Economics Work for Sustainable Fisheries,
Brussels, 14-15 May 2007

This seminar was an important step for fisheries policy in the EU where a stronger emphasis is now being placed on socio-economic aspects of fisheries policy within the framework of the Common Fisheries Policy. The European Commission is undertaking a consultation process on rights based management and the seminar was intended to provide a public discussion forum in support of the consultation. Around 200 people attended this two day seminar, with industry making up around 40% of the audience.

The agenda for the seminar, together with the presentations, can be found at http://ec.europa.eu/fisheries/meetings_events/events/archives/events_2007/140507/presentations_en.htm

Anthony Cox participated in the event and gave a presentation on "Good and bad subsidies and their suitability in achieving social and cultural objectives".

Forthcoming events

Seafood Summit 2008: Global Challenges, Local Solutions
Barcelona, 27-30 January 2008

Carl-Christian Schmidt has been invited to participate on a panel on seafood labelling.

IIFET 2008,
Nha Trang, Vietnam, 22-25 July 2008

The International Institute for Fisheries Economics and Trade (IIFET) will be holding its biennial conference in Vietnam in July 2008. This conference is the peak meeting for the fisheries economics profession. The OECD Secretariat is helping to organise the IIFET Policy Forum as part of IIFET 2008. Delegates should note that the deadline for submissions of abstracts for the conference is 20 January 2008.

See http://oregonstate.edu/dept/IIFET/iifet2008.html .