

IMPLEMENTATION OF THE BALI PLAN OF ACTION

Regional Stock-take (Gap Analysis) of the Current Situation in the
Asia-Pacific Region compared with Ministers' Objectives:
A Foundation Assessment

APEC FWG 01/2007



Final Report

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**Asia-Pacific
Economic Cooperation**

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Implementation of the Bali Plan of Action
APEC BALI PLAN OF ACTION ECONOMY SURVEY ANALYSIS
FINAL REPORT



ABBREVIATIONS & ACRONYMS USED IN THIS REPORT INCLUDE:

ABMM	Area-based Management Measures
ADPC	Asia Disaster Preparedness Centre
AMETEC	APEC Marine Environmental Training and Education Centre
ANA	Aquaculture Network of the Americas
AOMM3	Third APEC Ocean-related Ministerial Meeting
APEC	Asia-Pacific Economic Cooperation
APFIC	Asia-Pacific Fishery Commission
AVA	Agri-food and Veterinary Authority
BOBLME	Bay of Bengal Large Marine Ecosystem Programme
BPA	Bali Plan of Action
CBD	Convention on Biological Diversity
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CDEM	Civil Defence Emergency Management
CEC	NAFTA Commission for Environmental Cooperation
ChloroGIN	Geo Chlorophyll Global Network
CITES	Convention on International Trade in Endangered Species
COBSEA	Coordinating Body on the Seas of East Asia
COC	Code of Conduct
COMDA	Centre of Ocean Modelling Development and Application
CONCEPTS	Operational Network of Coupled Environmental Prediction Systems.
CPPS	Permanent Commission of the South Pacific
CTI	Coral Triangle Initiative
CZCP	Coastal Zone Community in Practice
DART	Deep Ocean Assessment and Reporting of Tsunami Buoys
EA	Enterprise Allocation
EAM	Ecological Approach to Management
EBSA	Ecologically and Biologically Significant Area
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
EMMP	Environmental Management and Monitoring Programme
EMS	Environmental Management Systems
ERA	Ecological Risk Assessment
EU	European Union
FAO	United Nations Food and Agriculture Organization
FFA	Forum Fisheries Agency



FTA	Free Trade Agreement
FWG	Fisheries Working Group
GAP	Good Aquaculture Practices
GATT	General Agreement on Tariffs and Trade
GEF	Global Environment Facility
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GIS	Geographic Information System
GISD	Global Invasive Species Database
GISP	Global Invasive Species Programme
Globallast	GEF-UNDP-IMO Global Ballast Water Management Programme
GLOSS	Global Sea Level Observing System
GOOS	Global Ocean Observing System
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
GPS	Global Positioning System
GRASP	Goos Regional Alliance for the South Pacific
HACCP	Hazard Analysis and Critical Control Points
HRPT	High Resolution Picture Transmission
ICG/PWTS	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
ICM	Integrated Coastal Management
ICOM	Integrated Coastal and Oceans Management
ICVMS	Integrated Computer Vessel Monitoring System
ICRAN	International Coral Reef Action Network
ICRI	International Coral Reef Initiative
IGO	Intergovernmental Organization
IMO	International Maritime Organization
IMO-BNC	The International Convention for the Control and Management of Ship Ballast Waters and Sediments
INAGOOS	The Indonesian GOOS
IOC	Inter-governmental Oceanographic Commission
IOCCG	International Ocean-Colour Coordinating Group
IODE	The IOC Committee on International Oceanographic Data and Information Exchange
IOGOOS	The Indian Ocean GOOS
IOMS	Integrated Marine Observing System



IOPC	International Oil Pollution Compensation Fund
IOSEA	Indian Ocean and Southeast Asia Secretariat
IOTC	Indian Ocean Tuna Commission
IPA	Inter-tidal Protected Area
IPCC	Intergovernmental Panel on Climate Change
IPOA	International Plan of Action
IPOA-IUU	International Plans of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing
IPOA-Sharks	International Plan of Action for the Conservation and Management of Sharks
IQ	Individual Quota
ISO	International Standards Organization
ISPS	International Ship and Port Security
ITIC	International Tsunami Information Centre
ITMEMS	International Tropical Marine Ecosystem Management Symposium
UN/ISDR	International Strategy for Disaster Relief -UN
IUCN	World Conservation Union
IUU	Illegal, Unreported and Unregulated
IRD	Institute de Recherche pour le Developpement, France
JTED	Juvenile Turtle Exclusion Device
LME	Large Marine Ecosystem
LOMA	Large Ocean Management Area
LRP	Limit Reference Point
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973, as Modified by the Protocol of 1978
MCS	Monitoring, Control and Surveillance
MEDP	Marine Ecological Development Plan
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MRA	Mutual Recognition Admission
MRCWG	Marine Resource and Conservation Working Group
MSC	Marine Stewardship Council
NAAEC	North American Agreement on Environmental Cooperation
NACA	Network of Aquaculture Centre in the Asia Pacific
NAFO	Northwest Atlantic Fisheries Organization
NCCFAP	National Climate Change and Fisheries Action Plan
NCVA	National Coastal Vulnerability Assessment



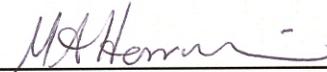
NDWC	National Disaster Warning Centre
NEAR-GOOS	Northeast Asia Region GOOS
NGO	Non-governmental Organization
NOAA	National Oceanic and Atmospheric Administration
NOWPAP	The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region
NPA	National Plan of Action for the Protection of the Marine Environment from Land-based Activities
NPAFC	North Pacific Anadromous Fish Commission
OCHA/UN	Office for the Coordination of Humanitarian Affairs of the United Nations
OECD	Organization for Economic Co-operation and Development
OMISAR	Ocean Models and Information Systems for APEC Region
OPRC	International Convention of Oil Pollution Preparedness, Response and Cooperation 1990
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PICES	North Pacific Marine Science Organization
PILN	SPREP's Pacific Invasive Learning Network
PNA	Protected Natural Area
PTWS	Pacific Tsunami Warning System
RAMSAR	The Convention on Wetlands of International Importance, especially of waterfowl habitat
RFMO	Regional Fisheries Management Organization
ROE	Rate of Effort
RPOA	Regional Plan of Action
SARS	Severe Acute Respiratory Syndrome
SBT	Southern Bluefin Tuna
SEAFDEC	Southeast Asian Fisheries Development Center
SEAGOOS	Southeast Asian GOOS
SHRIMP-PAC	Regional Strategy on Shipping-related Introduced Marine Pests in the Pacific Islands.
SIDS	Small Island Developing States
SME	Small and Medium Enterprise
SOP	Standard Operating Procedure
SOPAC	Pacific Islands Applied Geoscience Commission
SPREP	South Pacific Regional Environment Programme
SPS	Sanitary and Phytosanitary
SST	Sea Surface Temperature

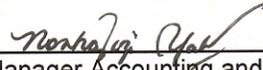


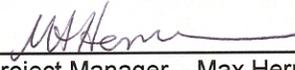
TAC	Total Allowable Catch
TARNS	Tsunami Alert Rapid Notification System
TBT	Technical Trade Barrier
TFEP	APEC Tsunami Taskforce on Emergency Preparedness
TWG	Tsunami Warning Group
UNCLOS	United Nations Convention on the Law of the Sea
UN	United Nations
UNEP	United Nations Environment Programme
UNEP-GPA/IGR-2	Second Intergovernmental Preview Meeting of the UNEP Global Program of Actions for the Protection of the Marine Environment from Land-based Activities.
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFSA	United Nations Fish Stocks Agreement
UNGA	United Nations General Assembly
USR	Upper Stock Reference
VMS	Vessel Monitoring System
VSAT	Very Small Aperture Terminal
WCPFC	Western and Central Pacific Fisheries Commission
WMO	World Meteorological Organization
WPA	Wetlands Protected Area
WSSD	World Summit on Sustainable Development
WTO	World Trade Organization



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APEC Bali Plan of Action Economy Survey Analysis Report

Towards Healthy Oceans and Coasts for the Sustainable Growth and Prosperity of the Asia-Pacific Community

The BPA Regional Stock-take (Gap Analysis) Project seeks to identify and describe activities implemented by APEC Member Economies, and to assess progress of APEC Member Economies towards implementing the goals and actions of the BPA. Data to assess the implementation of the BPA has been collected through desk-top research and survey questionnaires. The project also seeks to identify non-APEC activities of BPA relevance occurring in the Asia-Pacific Region in order to identify synergies and options for exploring avenues of influence towards further promoting the goals and actions of the BPA.

Executive Summary

In October 2007, a detailed questionnaire (the 'Economy Survey') was sent to 21 APEC Member Economies to canvass the extent to which their ocean and coastal-related activities have served to implement, or complement, the APEC Bali Plan of Action (BPA) 2005. The survey recipients were members of the APEC Marine Resources Conservation Working Group, and the APEC Fisheries Working Group, with one representative nominated as the primary point of contact in each Economy. A formally approved, consolidated submission was received from each participating Economy.

An extensive program of follow-up liaison, through telephone and email, was undertaken until the initial survey end-date of 31st January 2008, by which time a total of 16 completed surveys (76.19%) had been received, amounting to over 500 pages of submissions. The survey returns consisted of quantitative question responses, along with qualitative commentary to elaborate the quantitative responses. By March 2008, all of the quantitative data had been tabulated with graphic presentation, and the initiatives identified by Economies in the qualitative text had been collated under the headings of 'Domestic', 'Regional' and 'International'. Initial analysis was done on the data, and this was presented as an Interim Report at the Joint Fisheries Working Group and Marine Resources Conservation Working Group Meeting, which was held in Piura, Peru, 14-18 April 2008.

There were Six Volumes to the BPA Survey Interim Report:

- **Volume 1** – containing detailed analysis of each question in the Economy Survey;
- **Volume 2** – presenting the findings of another survey, which was conducted over approximately the same period, targeting ocean and coastal-related organisations, i.e. inter-governmental and non-governmental organisations, research institutes, universities, and private-sector companies (the 'Organisation Survey');
- **Volume 3** – presenting desk-top research findings on the ocean and coastal-related activities of each APEC Member Economy;
- **Volume 4** – presenting desk-top research findings on a wide range of organisations of relevance to oceans and coastal management;
- **Volume 5** – containing an analysis matrix collating the qualitative comments of the Economy Survey;
- **Volume 6a** – containing the raw survey response forms for the Economy Survey; and
- **Volume 6b** – containing the raw survey response forms for the Organisation Survey.

At the Joint Working Group Meeting in Peru, a decision was made to extend the period for survey returns to 31 July 2008. However, although repeat copies of the survey form were



requested by several Economies, and effort was made to encourage further participation, no additional completed submissions were received by that date. Accordingly, analysis of the survey returns has been completed and findings are presented in this Final Report.

The Final Report is accompanied by a Final Project Status Report, which also includes a final summary analysis of the Organisation Survey.

Survey Findings

This ambitious survey of the current status of implementation for the APEC Bali Plan of Action seeks to provide a stock-take of the extent to which Member Economies have adopted measures to meet the commitment made in Bali, 2005, by the APEC Ocean-related Ministers to take:

“subject to available resources and capabilities, substantial and concrete steps to balance sustainable management of marine resources and the marine environment with economic growth”.

In its subject breadth and geographic coverage, this Bali Plan of Action stock-take survey is one of the most comprehensive snap-shots of ocean and coastal management ever undertaken. Importantly, the survey submissions represent an approved, staffed response by Economy Governments and, therefore, can be cited as authoritative input.

The findings of the survey demonstrate that there are a plethora of ocean and coastal-related initiatives and programs underway in the APEC Region, and that many of these activities have only commenced since the Bali Plan of Action was adopted in September 2005. However, the survey does not demonstrate conclusively that these activities were necessarily undertaken as a direct consequence of commitment to the Bali Plan of Action. Rather, a wide range of international legal instruments, soft-law commitments and institutional arrangements are cited in relation to many of the activities. Therefore, the Bali Plan of Action is probably best understood as an over-arching road map that helps Member Economies to see these discrete initiatives in a linked, holistic manner that might not otherwise be possible. To that extent, the Bali Plan of Action facilitates clarity in the task of evaluating whether Economies are making progress individually and collectively.

Some Economies that are yet to emerge as fully developed have reported the launch and progress of ocean and coastal programs that are impressive in scope and that contribute substantially to international initiatives. Nevertheless, the survey does appear to have revealed a dichotomy between wealthier Economies and lesser-developed Economies in the number of ocean and coastal-related activities undertaken, and the breadth, depth and sophistication to which they are executed. Thus, there may well be a need to consider strengthened mechanisms for information exchange and capacity building to help developing Economies meet their commitments under the Plan.

Another factor of possible relevance to analysis of the BPA Stock-take Survey is that member Economies undertook to implement the plan between 2006 and 2009.¹ Some delegates at the Joint Working Group Meeting in Peru noted this fact and suggested that any absence of activity in a given BPA area that showed in this stock-take (undertaken in 2007/2008) might reflect little more than due process for activity development. This possibility is acknowledged; however, the BPA stock-take presents a summary of implementation progress as reported by the Economies. The analysis does not attempt to pass judgement nor suggest that an absence of progress in any particular area implies an intention not to implement the plan eventually. Nevertheless, consistent under achievement was noted by certain Economies across all of the BPA action areas, which might suggest that those Economies (all developing Economies) may not actually be on track and could benefit from assistance.

¹ Note 3, *The 2nd APEC Ocean-related Ministerial Meeting (AOMM2)*, 13-17 September 2005.



Goal I. Ensuring the Sustainable Management of the Marine Environment and its Resources

I.a Understanding oceans, seas and coasts

Oceans Observations and Data Collection

i) All participating Economies declared that their data collection methods conform to the 'FAO Strategy for Improving Information on Status and Trends of Capture Fisheries'. However, very few respondents elaborated to explain how their methods ensure that fisheries data is based on best evidence, are objective and transparent, participatory, timely and flexible. A wide range of data sources was reported, including logbooks (including e-logs), catch returns, quota monitoring, sampling, surveys, observers, vessel monitoring systems. However, lesser-developed Economies indicated that they rely primarily on fish landing statistics, and industry efforts on rate of effort.

Half of the respondent Economies maintained that they do assist other APEC Economies to ensure that their fisheries data collection method(s) conform to the FAO Strategy for Fisheries Status and Trends Reports. Most Economies indicated that they provide comprehensive fisheries data to RFMOs, and half of them claim to publish fisheries data on the internet.

ii) Almost 70% of respondent Economies reported that, since September 2005, they have participated in new regional research or data sharing partnerships with APEC Economies for Pacific and Indian Ocean *in-situ* observations to enhance global observations of the oceans and coasts. Understandably, most of the examples cited were regional or international in scope, and involved: the deployment of observation floats and buoys, conduct of research voyages, operation of sea-level measuring stations, participation in workshops, training of scientists, direct sharing or open publication of data, bilateral and multi-lateral studies, and more.

iii) More than half of the respondents reported that they have taken actions to implement the GEOSS Implementation Plan. Whilst a 62% confirmed participation rate in GEOSS is significant, there appears to be considerable disparity between the extensive actions being taken by some Economies and the complete lack of action by others. This suggests scope for greater collaboration and possibly awareness building.

iv) Although a majority of respondents did report that they have either provided or received assistance with implementation of GOOS, almost 40% did not. This result is consistent with the spread of qualitative comments, which reflected good levels of activity by some Economies and silence on the topic by others.

v) Quantitative responses indicated a high level of activity by Economies to improve the exchange of observational data for prediction, forecast, and watches and warnings. Paradoxically, although relatively few respondents offered qualitative elaboration, several of those that did do so cited activity associated with tsunami warning; however, the quantitative result shows data exchange for the purpose of 'watches and warnings' to be slightly less active than for prediction and possibly less active than for forecasts.

vi) There is little evidence that the OMISAR initiative has been taken up comprehensively by APEC Economies. A small group of Economies appear to have taken the lead in promoting the idea, but even they did not report activity since late 2005.

vii) An overwhelmingly positive response to the question on climate change research furnishes strong evidence that there is strong interest by APEC Economies in the issue, and active effort by them in the collection and sharing of relevant information. Activities have included: directed research; hosting of workshops; climate observation programs; sea level measurement programs; guidelines, checklists and reports for coastal management (e.g. local government and coral reef managers); public awareness and education programs; vulnerability studies; institutional restructuring to create focal points for coordination; and more. There is clear indication that much of the activity related to climate change has been



recent; however, most of the initiatives cited by Economies have taken place at the domestic level, possibly indicating potential for greater collaboration between APEC Economies.

viii) The survey responses reveal overall satisfaction with the level and effectiveness of exchange of research and information on ecosystems within the respective Economies. Slightly less satisfaction was expressed about the level of such information exchange within the APEC region; whilst much less satisfaction was expressed about the overall effectiveness of research and information exchange within the APEC region. Criticism offered of the low effectiveness of information exchange at the APEC level primarily appears to be oriented on two points: first that communication between APEC Economies on ecosystem-based management is poor; and second, that there is no comprehensive framework to facilitate such communication and purposeful liaison within APEC.

ix) A large majority of participating Economies indicated that they do “share research and information” on invasive marine species. However, the qualitative data suggests that there is a correlation between the developmental status of an Economy and the extent to which it conducts research on marine invasive species, provides information on the topic, and develops mechanisms for monitoring and controlling introduced marine pests. In general, developing/emerging Economies noted that they have done little in this area. Another trend in the qualitative data is for developing Economies to cite their association with regional or multi-lateral programs rather than specific domestic initiatives.

Understanding the value of the marine sector

x) The survey data suggests that some Economies see the study of value for the marine environment and marine industries largely as a domestic activity. Whilst the results of such research were reported to be shared commonly (e.g. through seminars or published papers) fewer Economies appear to approach the task through a collaborative process of information exchange. Nevertheless, the high number of positive respondents indicates that Economies accept that the study of market and non-market value of the marine environment and marine industries is a worthwhile activity.

I.b Managing the marine environment sustainably

Ecosystem-based Management

i) Although six Economies indicated that they have participated in efforts to develop an agreed set of factors to be applied in defining marine ecosystems in the Asia-Pacific region, only one Economy actually cited a relevant example in its amplification text.

A total of 75% of respondent Economies indicated that they have participated in efforts to develop a key set of variables to monitor and assess changes in marine ecosystems in the Asia-Pacific Region. However, although qualitative data provided in support of the survey response demonstrates a broad range of activity associated with the development of ecosystem indicators, there is only one workshop cited as a regional activity to establish a key set of variables.

ii) All reported efforts to identify ecologically and biologically significant areas (EBSA) took place at the domestic level. Only two respondent Economies indicated no action in this regard. The remainder cited a rich array of programs and initiatives that included: the creation of thousands of hectares of MPA; the protection of island areas as MPA; the creation of fisheries protected areas and no-take zones; the establishment of an inter-tidal protected area; bioregional assessments; the creation of a marine national monument and a national estuarine research reserve; the development of MPA policies and plans; and more. At the international level, an Economy noted its support of a Marine Ecological Experts Workshop in 2005 that developed criteria for EBSA, along with subsequent related side-events at other international meetings.



The survey has revealed that 14 out of a total of 16 participating Economies have identified EBSA and established area-based management measures to protect them. However, five of the 16 Economies declared that their area-based management initiatives are either not based on best available science or are not consistent with international law (the structure of the question does not discriminate between the two criteria). Qualitative data for this question may reinforce a conclusion that the scientific/legal foundation for some area-based initiatives may not be strong.

iii) A significant majority of the surveyed Economies indicated that they have increased sharing of best practices on the roles and function of the business and private sectors and communities in sustainability of the marine environment, and promoted the involvement of these sectors. The mechanisms used to achieve this outcome include *inter-alia*: liaison with NGOs; the establishment of consultative committees and councils; the funding of community projects; and the involvement of entrepreneurs in environmental inspections.

iv) Only two Economies reported that they have not taken any actions to improve understanding and management of the impacts that humans have on the coastal and ocean environment. Such a positive response is consistent with a broad range of relevant activities that was offered as elaborative comment. Almost all of the cited initiatives are done by Economies at the domestic level.

Marine Pollution

v) The data provided by APEC Economies on implementation of the UNEP-GPA appears to reflect a perception that although land-based sources of marine pollution is a problem with regional and even global consequence, its cause is essentially a matter that occurs on land, over which Economies have full sovereignty. Thus, the imperative is weak to act on multi-lateral programs to address problems/sources that are likely to be seen mainly as local (hence, 50% of Economies either declined to answer the question or replied in the negative).

The Second Intergovernmental Review Meeting (IGR-2) of the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA) was held in Beijing, China, on 16-20 October 2006. A total of 62.5% of respondent Economies confirmed attendance at IGR-2.

vi) However, most Economies reported that they have *not* undertaken any cooperative studies with UNEP-GPA to determine economic drivers that contribute to land-based sources of marine pollution. Also, although five Economies indicated that they have participated in such studies, not all of the examples offered in elaborating text can be seen to have examined the subject question of *economic drivers* for land-based sources of marine pollution. If correct cost/benefit considerations are to be applied to the decision on whether to make the investments needed to combat land-based impacts on the marine environment, the economic drivers behind the phenomenon of land-based sources of marine pollution must be known. Nevertheless, the relatively low participation rate by Economies in cooperative studies with UNEP-GPA suggests that the importance of such studies may not yet be understood. There would appear to be scope for education and awareness building in this regard for APEC Member Economies.

vii) More than half of the respondent Economies rated the level of their support for regional and international cooperation to prevent and control sea-based pollution of the marine environment as 'moderate' or better, with 25% of Economies rating the level of their support as 'high'. No single Economy can address this transboundary problem in isolation, and the importance of a multi-lateral approach would appear to be self-evident. However, three Economies rated their support as 'minimal'.

viii) Twenty five per cent of Economies reported that they are *not* actively involved in actions to address derelict fishing gear and derelict fishing vessels. Comments in elaboration for this question did not explain why they are not so, but from qualitative data provided in support of other questions, such an outcome might be explained by the small size and artisanal nature



of the fishing industry in these Economies, and/or their lesser developed status. However, almost all other Economies reported that they are actively involved. The strong positive response to this question, combined with qualitative data indicating measures such as: studies, buy-back programs, vessel monitoring, inspections, guidelines, etc., suggest that Economies generally recognise the importance of this issue and are taking steps to address it.

Only three Economies stated definitively that their actions to combat derelict fishing gear and vessels are implementing recommendations from any APEC-related research. However, the survey does not explore whether an Economy that responded negatively has done so because it is unaware of any relevant APEC-related research, or because it does not find the recommendations arising from such research to be applicable / useful.

ix) Eleven Economies reported that they have undertaken analysis of ocean circulation, wind and drift patterns to identify areas of marine debris accumulation and likely impact. A total of 68% of Economies observed that they participate in the development of practical guidelines to manage marine pollution in cooperation with either FAO or other relevant bodies. Half of the responding Economies declared that they have improved their understanding of the harmful effects and costs of marine debris, and slightly more than half indicated an improved understanding of the impediments to proper disposal and recovery of marine debris.

Sixty two percent of Economies declared that they have identified focal points to disseminate expertise and information, and 75% that they have created new legislation to address marine pollution. However, only seven Economies claimed to have implemented economic measures to combat marine pollution.

Marine Invasive Species

x) Most respondent Economies indicated that they have *not* been involved in either the development or implementation of the 'Regional Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests'. The survey response and elaborating comments suggest that Economies have a good awareness of the problem of introduced marine pests, and are taking measures domestically to address the problem. There is also evidence of some cooperation between Economies, but this effort does not appear to be as strong as that being expended within Economies. One Economy noted that an earlier project to encourage the development of a relevant APEC Regional Management Framework no longer has funding, and cited this as the primary reason for discontinued effort on behalf of the initiative.

xi) Half of the respondent Economies indicated that they have not "ratified or adhered to" the IMO Ballast Water Convention. However, 'The International Convention for the Control and Management of Ships Ballast Water and Sediments' (IMO-BWC) was only adopted by consensus at a Diplomatic Conference at IMO in London on 13 February 2004. This means that Economies have had relatively little time to examine, consider and prepare for ratification. Viewed in this light, ratification or adherence by 47% of responding Economies could perhaps be considered a strong indication of support.

Most Economies reported that they have neither encouraged nor assisted other APEC Economies to ratify or adhere to the IMO-BWC. However, conversely nearly half indicated that they have done so. Review of the qualitative data offered in elaboration to this question reveals that the nature of such encouragement or assistance would likely have been through IGO or multilateral fora, or by way of technology development.

Only six Economies indicated that they have passed new legislation or enhanced existing legislation on marine invasive species. Such a figure is consistent with the findings which identified that less than half of the participating Economies have ratified the IMO-BWC. However, qualitative data reveals that several other Economies are in the process of developing new laws, regulations and strategies. Half of the responding Economies reported that they have participated in coordinated efforts or investigation with inter-governmental



organisations such as IMO, FAO or APEC. Also, almost half stated that they have strengthened relevant institutions.

xii & xiii) The strongest reported level of Economy participation was with regard to cooperation on the establishment of a relevant scientific network and information exchange system. However, an equally negative response to a question on whether APEC structures are used to communicate the need for measures against marine invasive species, suggests that such cooperation in information exchange may not necessarily be done through APEC. Most Economies reflected that they have engaged in training for officials responsible for the control of marine invasive species.

Coral Reefs and Other Vulnerable Areas

xiv) Almost all Economies reported action and progress since September 2005 to improve the conservation of vulnerable areas. All but one participating Economy reported enhanced management or enforcement to control activities that have a destructive impact. Thirteen Economies observed that actions to reduce destructive impacts were based upon best available scientific information, while fourteen Economies (87%) also reported enhancement in monitoring and research. Approximately 70% of respondent Economies declared that they have enhanced local management to maintain environmental and economic benefits.

xv & xvi) Quantitative responses show that support by APEC Economies for the 'International Coral Reef Initiative' (ICRI) and 'International Coral Reef Action Network' (ICRAN) is moderate to strong. The extent of activities undertaken by APEC Economies to ensure coral reef conservation, and to raise public understanding on the importance of coral reefs, sea grass beds, and mangroves to the overall marine ecosystem was also reported to be moderate to strong. In addition, Economies maintained that they have shown generally strong support for international and regional efforts on the protection of wetlands and promotion of wetland awareness.

xvii & xviii) Thirteen Economies reported moderate to strong progress with regard to the development of sustainable coastal policies and integrated coastal management plans. However, one Economy described progress as low, and two others declined to respond to the question, thus highlighting a possible need for continued capacity building in this area.

More than half of the respondent Economies reported that they have received weak encouragement from other APEC Economies to develop sustainable coastal policies and integrated coastal management plans to accommodate the conservation and protection of vulnerable areas. One economy declared that it has received no encouragement at all. However, six Economies maintain that such encouragement from fellow APEC Economies has been strong. Qualitative data helps to explain these seemingly contradictory opinions. To an extent, encouragement to develop sustainable coastal policies and ICM plans has been received through inter-governmental fora rather than directly from "other APEC Economies". Also, one developed Economy explained that it neither requires nor expects such encouragement.

I.c Managing living resources sustainably

International Fisheries Governance

i) A significant number of APEC Economies ratified or indicated adherence to UNCLOS, UNFSA, and FAO Compliance Agreement before September 2005. However, of the three international agreements, UNCLOS is widely adhered to by APEC Economies, whilst about a third of Economies have yet to ratify or accede to the UNFSA and FAO Compliance Agreement.

ii) The survey illustrates that over half of the respondent Economies have become parties or cooperating non-members to existing or newly-formed RFMOs since September 2005.



Furthermore, both the Organisation and Economy surveys have identified endeavours by Economies to address gaps in fisheries governance by establishing new regional organisations to manage fisheries and areas where no measures currently exist.

Trade Facilitation and Market Access

iii) The results of the survey demonstrate a relatively high level of adoption and implementation of some of the non-binding fisheries instruments. In general, more than half of the APEC Economies have adopted measures to implement the FAO Code of Conduct for Responsible Fisheries and its associated IPOAs, and the FAO Strategy for Improving Information on the Status and Trends of Capture Fisheries. Most of the respondent Economies indicated that they implemented the FAO Code of Conduct before September 2005. Only one Economy reported that the FAO Code of Conduct is not applicable because it is not a member of the FAO. Another Economy stated that it implements the FAO Code of Conduct through the Regional Guidelines for Responsible Fisheries in Southeast Asia.

With respect to the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries, respondent APEC Economies generally signified their implementation of the FAO Strategy. Some of these Economies implemented this Strategy prior to September 2005. One Economy observed that it has programs that complement the Strategy, while another declared that it does not implement the Strategy at all. There are also a number of Economies that declined to answer this particular survey question.

There is relatively wide application of the International Plans of Action across the APEC Region. Among the various IPOAs, the IPOA-Sharks has been adopted by the greatest number of Economies, followed by the IPOA-Capacity and IPOA-IUU. A number of APEC Economies have stated that the reason for not implementing the IPOA-Seabirds is that the issue is not relevant to them, either because they are not members of FAO or their fisheries do not have seabirds as by-catch.

Sustainable Fisheries and Aquaculture Management

iv) Four economies rated their level of engagement in applying the ecosystem approach to fisheries management as less than 'moderate', whilst nine others rated theirs as 'moderate to high'. Interestingly, one Economy indicated that the ecosystem approach is "not applicable".² Economy responses to this survey suggest a possible bias in application of the ecosystem approach to fisheries management, where implementation at the legislative, policy and strategic levels appears mainly to be achieved within the management frameworks of wealthier Economies. Emerging and lesser-developed Economies tend to report application of the ecosystem approach primarily with regard to MPAs.

However, the survey responses do suggest an overall improvement in the level of implementation across the region. With support through training, and other mechanisms identified in the Organisation Survey, the situation reportedly is improving, although obstacles are said to remain. The primary obstacles to broad application of ecosystem-based management, cited by more than one Economy, are: limited data, limited human resource capacity, financial restrictions and the need to develop cost-effective methodologies for management, and monitoring.

A majority of Economies reported 'moderate-to-high' "improvements in decision-making" to reflect a precautionary approach. Half of the respondent Economies observed that their level of engagement in fishing capacity control, to ensure that it does not exceed fisheries resource availability, is also 'moderate to high'.

However, Economy Survey qualitative responses offer little evidence that the precautionary approach is being applied universally throughout the APEC Region in fisheries decision-making processes. Survey responses also show that, where the precautionary approach has

² Elaboration by this Economy revealed that it has only a small fishery of less than 2,000 ton per year.



been taken up on a broad basis, this is most often done by developed Economies. In such wealthier economies, the precautionary approach has been embedded into many mechanisms from legislation through to fisheries management strategies. Examples of instruments where the precautionary approach is reported to have been embedded include: 'Risk Management Frameworks'; 'Legislation'; 'Environmental Impact Assessments of Fisheries'; 'Harvest Strategies'; and a 'Fisheries Management Decision-Making Framework'. International obligations relating to the precautionary approach under the UNFSA also appear to drive some Economies, i.e. implementation of the precautionary approach is obligatory under the UNFSA (see Article 6), which requires State parties to implement the approach in conserving and managing straddling and highly migratory fish stocks.

v) A strong majority of Economies reported that the use of at-sea, port-State and trade-related measures has been strengthened since September 2005 to combat IUU Fishing. Some Economies tended to discuss overarching structural adjustments to enhance their ability to combat IUU fishing activity. Others reported specific positive progress including: new legislation that is set to regulate the activities of distant water fishing fleets, and preparation of a draft RPOA to Promote Responsible Fishing Practices, including combating IUU fishing.

A majority reported strong performance in enhancing MCS programs. However, only seven Economies indicated a 'moderate-to-high' level of performance in establishing adequate sanctions as deterrents. Qualitative responses show that, in general, developed Economies tend to pursue apprehension, forfeiture, and imprisonment as sanctions and deterrents; whereas, lesser-developed Economies primarily reported financial penalties. However, it is unclear from the responses whether sanctions have reduced IUU activity, or whether IUU has relocated. Thus, there is a possibility that the reductions in offences reported by at least one Economy may only have had a positive outcome in the waters of that Economy.

vi) Almost half of the respondents indicated that their Economies have taken measures to facilitate the sharing of APEC Economy experiences in the reduction and adjustment of fishing capacity. On the other hand, there are many Member Economies that reportedly have not done so, which suggests scope for greater collaboration and possibly awareness building.

vii) Half of the respondent Economies declared that GEOSS data plays either a 'low level' role or makes no contribution at all to achieving sustainable fisheries. However, interestingly, responses to this question reflected either one extreme or the other, i.e. four Economies indicated that the contribution of GEOSS data to sustainable fisheries is 'strong'. There would appear to be a need for improved awareness of GEOSS and its potential as a tool to assist in sustainable fisheries management.

viii) Half of respondent Economies indicated that they have supported capacity building and developed market-based conservation tools for live marine fish. However, there was a high number of Economies that declined to answer this question, which possibly reflects the relevance of reef fish only to some APEC Economies.

ix) Similarly, a majority of respondent Economies reported that they have implemented measures since September 2005 to reduce by-catch, but almost as many did not respond to the question. For some Economies, particularly those in tropical waters, species diversity is so great and the market is such that only iconic species, such as turtle or dolphin, are considered to be "by-catch". However, qualitative data suggests that by-catch minimisation strategies are widely adopted throughout APEC Economies.

x) With regard to developing or participating in programs to help developing Economies to contribute to marine turtle conservation, more than half of the participating Economies responded with a good-to-strong response. However, two Economies did not respond to the question, and two others indicated that they have taken no initiatives in this area. When combined with the Economy that marked its performance in this regard as less than moderate, a total of almost one third of Economies are potentially not active, or not very active in this endeavour, suggesting scope for further effort.



xi) A large majority of respondent Economies rated their capacity to implement domestic plans of action for shark conservation and management to have 'Improved Moderately' or better, with only three Economies either not reporting or showing no improvement.

xii) Of the sixteen respondent Economies, a small majority reported an improvement in their understanding of the interaction between climate and fisheries in the Asia-Pacific region. However, almost 40% of the Economies did not report any increase in their understanding of this field. One Economy observed that it has concentrated studies on the effects of climate change, i.e. two major studies on climate change were said to have been completed, one related to the impacts of climate change on marine life and the other to climate impacts on fisheries and aquaculture. That particular Economy also claimed to have endorsed a National Climate Change Adaptation Framework in 2007, which was said to have resulted in development of a National Climate Change and Fisheries Action Plan (NCCFAP). Another developed Economy noted that the long-term effects of climate fluctuations on recruitment in fisheries are unknown. Potential issues of concern were said to include: effects on productivity, ocean acidification, increasing water temperatures, toxic algal blooms, and changes in local ocean circulation.

xiii) More than half of the respondent Economies indicated strongly that they have improved protection of critical sites for the replenishment of fisheries. However, a high number of 'No Response' may indicate that a significant number of Economies are yet to take action in this regard.

xiv) Only a small number of Economies reported a moderate-to-high level of involvement in developing an 'APEC Strategy on Sustainable Aquaculture'. The qualitative comments revealed knowledge of efforts to instigate the development of a strategy, although no formal strategy was reported to be underway. Responses show a need for support to develop a strategy, and that current resources have been directed to the establishment of 'Aquaculture Networks' that appear to be the precursor considered necessary for any APEC-wide strategy. Participants at the BPA Implementation Workshop held at Manado in November 2007 agreed that the development of a formal strategy would be possible based on the two networks (i.e. Network of Aquaculture Centres in the Asia-Pacific Region, and the Aquaculture Network for the Americas).

xv) Six Economies reported that they have a 'moderate-to-high' level of engagement with FAO to improve deep-sea fisheries knowledge, whilst four others reported either no engagement, or a low level of engagement with FAO in this regard.

Goal II. Providing for Sustained Economic Benefits from Oceans

Maximise Value from Use, Production and Harvesting

i) A total of 75% of respondent Economies indicated a strong level of activity since September 2005 in improving understanding and management of the impacts of aquaculture on environmental sustainability. A strong majority of Economies also claimed to have been active in securing consumer confidence in aquaculture products. A similar majority of APEC Economies reported active engagement in the task of facilitating the sustainable contribution of aquaculture to coastal communities, wild stocks and food security.

ii) Only four Economies responded to the question on whether they participated in the launch of the ANA and have participated in implementation of its proposed action plan in cooperation with the FAO. Of these, only two reported moderate to strong participation.

iii) Half of the participating Member Economies stated that they have been strongly engaged in improving production and post-harvest practices through harmonised standards. However, 30% of economies did not respond to this question, possibly suggesting scope for greater collaboration and awareness building.



iv) Although more than half of the respondent Economies indicated that they are active in improving the traceability of fish and fish products, the indicated level of activity was only moderate. Also, almost an equal number of Economies did not respond to this question, suggesting potential for strengthened effort on this Action Item.

v) Most respondent Economies reported a strong level of effort to combat corruption that undermines sustainable fisheries management and fair trade in fisheries products. Nevertheless, almost one third of the Economies that participated in the survey declined to answer this question, once again suggesting potential for strengthened effort on this Action Item.

vi) Almost one third of Economies reported strong activity in promoting the use of voluntary initiatives, such as certification schemes. Nearly the same number of respondents indicated below-moderate levels of activity, and the same number again did not respond to the question. This response suggests that Economies have not embraced the use of voluntary schemes as tools for fisheries management.

vii) The survey responses reveal overall mixed levels of activity with regard to minimising fisheries discard and wastage in order to maximise economic benefits from fisheries and aquaculture. Also, once again, nearly one third of participating Economies declined to answer this question, which could indicate a need for greater awareness of the issue.

viii) A majority of participating Economies responded positively to this question demonstrating strong levels of activity in combating maritime crimes to ensure the safety of fishing and navigation.

Efforts to improve trade and access to markets of fish products are necessary to maximise sustained economic benefits from trade.

ix) An overwhelmingly positive response to this question furnishes strong evidence that the respondent Economies have been active in their support of the WTO/Doha negotiations, in particular those related to market access for fish and fisheries products, and fisheries subsidies. Only three Economies either did not respond or did not indicate any related activity.

x) Out of the sixteen Member Economies, almost half of the respondent Economies did not respond to the question on the enhanced capacity of the fisheries sector to adapt to the results of WTO negotiations. A further quarter indicated that no initiatives in this regard have been taken or that the issue is not applicable. Only about a quarter of the respondent Economies rated the level of their activity as moderate to strong, which suggests scope for greater collaboration and possibly awareness building on this Action Item.

xi) The quantitative data demonstrates that a majority of the respondent Economies have undertaken a stock-take of existing commitments regarding fisheries and fish products in free-trade agreements and regional Asia-Pacific trade agreements or related cooperative agreements since 2005. Only three Economies reported that they have not done a stock-take, and four Member Economies did not respond.

xii) The quantitative data (half of the Economies reported moderate or greatly improved access) demonstrates a significant enhancement of market access for the products of small and medium enterprises (SMEs), and small-scale fisheries and aquaculture in the respondent Economies.

xiii) The respondent Economies reported significant success with regard to compliance with international law by removing discriminatory practices that obstruct the trade of fish and fish products. However, three Economies declined to respond to this question, and one reported that it has taken no steps in this area at all.



xiv) Almost all respondent Economies rated high levels in ensuring that health and safety standards and practices for fish and fish products are transparent, non-discriminatory and based upon best scientific information.

Goal III. Enabling Sustainable Development of Coastal Communities

Enabling Integrated Management

i) All but one of the respondent Economies rated that they had a satisfactory to higher rating in creating awareness and engagement of coastal communities in monitoring and conservation of the coastal environment.

ii) Half of the participating Economies rated themselves above satisfactory in identifying the roles of fishing communities (including the role of women) in conserving and restoring the marine environment.

iii) Twenty-five percent of participating Economies rated their performance as 'excellent' in encouraging coastal communities to contribute to environmental conservation through beach cleaning, tree planting, and maintenance of tidal and aquatic plant-beds. A further half of the Economies described their performance in this regard as 'good'.

iv) Most Economies rated their performance in actively promoting best practice in integrated oceans and coastal management as satisfactory to good.

v) Three-quarters of Economies reported that their efforts in advancing regional capacity for comprehensive management of marine resource use and coastal hazards through partnerships between government, the community and academia were satisfactory or better.

vi) The quantitative assessment for efforts to reduce the adverse impacts of tourism on marine resources and the environment, including through the promotion of sustainable marine ecotourism, reflect a slightly weaker trend than for the other parts of this question. Indeed, two Economies rated their performance in this regard as 'poor', and a further three declined to answer the question. However, overall, the majority of economies rated their performance as satisfactory to good.

Hazard Mitigation

vii) Over 60% of participating Economies rated moderate to high levels in increasing coordination to fulfill responsibilities to implement the IOC's end-to-end tsunami warning system. A quarter of the respondent Economies rated less than moderate levels. One Economy did not respond to this question, and another declared that it is 'not applicable'.

viii) A majority of Economies rated moderate to high levels of progress in sustaining and expanding the multi-hazard capabilities for disaster reduction at domestic, regional and international levels since September 2005. Two Economies were rated below moderate, and a further three did not respond.

The quantitative interpretation demonstrates that a large majority of respondent Economies have not participated in the 'All-Hazards Forecast and Warning Compendium' initiated by the June 2005 APEC/US workshop in Hawaii. Indeed, 50% of the Member Economies either reported that they have never heard of this document or did not respond.

Post-Natural Disaster Rehabilitation and Planning

ix) A small majority of respondent Economies rated increased levels of coordination with the APEC Task Force on Emergency Preparedness, and other relevant APEC fora. Other Economies rated no increase, with four Economies that did not respond.



A majority of respondent Economies rated an increase in use of expertise from the International Tsunami Information Centre through the International Coordination Group for the Tsunami Warning System in the Pacific, or the Indian Ocean Tsunami Warning System. Whereas, slightly more than quarter of the Member Economies rated that they have not increased use of this expertise. Only two Economies did not respond.

x) Most Economies reported that they have assisted affected coastal communities to re-establish aquaculture and fishing effort, ensure sustainability, or rehabilitate the coastal environment. However, almost half of the participating Economies either replied negatively to this question or did not respond.

xi) A significant majority of the participating Economies indicated that they have not been involved in the creation of an on-line database to allow APEC Economies to update and view details of all tsunami-related projects, programs or activities, or declined to answer the question. Nevertheless, twenty-five percent of the Economies stated that they have created an on-line database.

xii) More than half of participating APEC Economies rated moderate success in undertaking the development of integrated coastal zone management plans that anticipate and plan to mitigate the impacts of hazards and climate extremes, such that coastal communities can adapt and mitigate detrimental effects. Four Economies reported high success in this regard, while three others either did not respond or indicated that the question was not applicable.

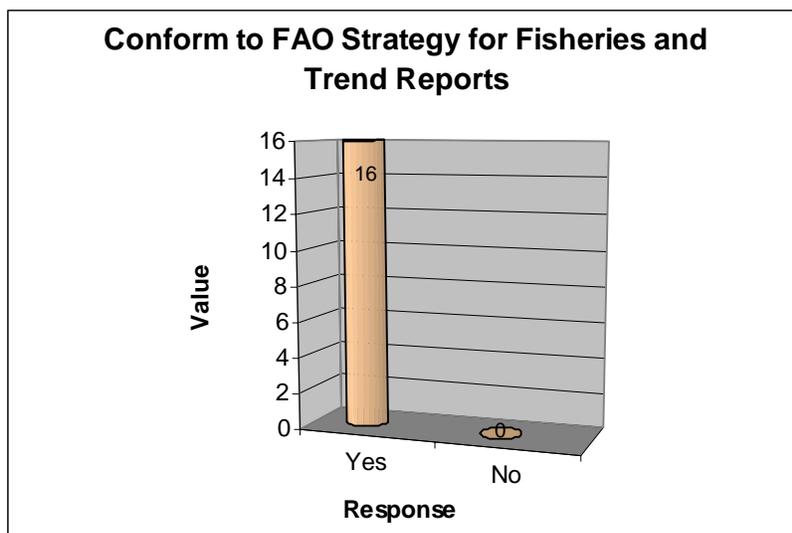


ANALYSIS OF APEC ECONOMY SURVEY SUBMISSIONS ON IMPLEMENTATION PROGRESS OF THE BALI PLAN OF ACTION

Returned Surveys: 16 out of 21
Survey Response Rate: 76.19%

GOAL 1: ENSURING THE SUSTAINABLE MANAGEMENT OF THE MARINE ENVIRONMENT AND ITS RESOURCES

Question 1	Relates to BPA Action: I.a.i (Part thereof)
Does the fisheries data collection method(s) of your Economy, conform to the FAO Strategy for Fisheries Status and Trend Reports?	Build the Capacity of APEC Economies to conform to the FAO Strategy for Fisheries Status and Trends Reports, and increase the number of APEC Economies providing comprehensive data on fisheries to relevant regional fisheries management organisations (RFMOs), including reporting on the impact of fishing.



Interpretation of Quantitative Data

All 16 respondent Economies stated that the fisheries data collection method(s) of their Economies conform to the FAO Strategy for Fisheries and Trends Reports. However, very few respondents elaborated to explain how their methods ensure that fisheries data is based on best scientific evidence, are objective and transparent, participatory, timely, and flexible. Therefore, there may be grounds to suspect that the quantitative response is optimistic and may not accurately reflect the actual extent of compliance with the FAO Strategy. Qualitative responses help to indicate the true situation.

Domestic Initiatives

Four Economies reported that fisheries data is compiled from one or more of the following sources: logbooks (including e-logs), catch returns, quota monitoring, sampling, surveys, observers, vessel monitoring systems, and (in a single case) "a range of other sources". In one instance, an Economy noted that efforts to improve fisheries statistics are complementary to the FAO Strategy but not directly driven by a requirement to comply with the strategy. Participatory monitoring of fisheries status and trends was reported by that Economy to be achieved through consultation with resource users in fisheries 'Advisory Committees', and guided by a 'Fisheries Checklist' (to help in self-assessment and external reporting of



progress towards fisheries sustainability). Another Economy highlighted that stakeholders are invited to “review and provide comments” on the analysis of fisheries data. Only two Economies emphasised the collection and reporting of marine environmental data, and one of these also noted the importance of fisheries households to the production of fisheries statistics.

Lesser-developed Economies reported that they rely primarily upon fish-landing data, which is categorised under species, with estimates of rate of effort (ROE) based upon industry inputs, i.e. fishing gear and total number of fishing vessels. The challenge of obtaining reliable information was noted, especially for river, small-scale and multispecies fisheries. One Economy emphasised the development of a database system to store, disseminate (including, by several Economies, via open publication on the internet) and analyse ROE and landing statistics. However, the publication of data on the internet was reported by one Economy to be restricted specifically to “non-confidential data and reports”.

Regional Initiatives

No Economy reported any regional initiatives for the production and reporting of fisheries status and trends.

Relevant International Initiatives

One Economy cited a source of information to be foreign markets to which fisheries products are exported. Another declared progress in compliance with the FAO Strategy “with support of FAO” but did not elaborate on the nature of this support. The requirement to cooperate with other States in the management of transboundary stocks was also noted.

Discussion of Organisational Perspective (from the Survey of Organisations)

Organisational survey responses emphasised the assistance given by RFMOs and IGOs to member Economies. Specific initiatives that were cited include the development of a tuna fisheries database and a reef fish data repository. One respondent noted that four APEC Economies have succeeded in certifying certain of their fisheries as ecologically sustainable, and a further five fisheries are presently being evaluated in this regard.

Response Summary

Only 25% of responding Economies specified a broad range of sources and methods for the production and reporting of fisheries statistics. In each case, these were fully developed Economies. Those responses that reported primary reliance upon fish landing statistics, and evaluation of industry input factors, were in each case, from lesser-developed Economies. Such a trend indicates that there could be scope for improved compliance with the FAO Strategy though the enhanced provision of capacity building assistance.

However, at the BPA Implementation Workshop held in association with this survey at Manado (Indonesia), in November 2007, participants noted a lack of awareness on capacity building opportunities afforded by FAO and other organisations, and the existence of trust funds and grants designed to support implementation of the strategy. Participants also expressed concern regarding the data submission criteria of FAO, citing challenges associated with: maintaining and/or improving data quality; FAO-inconsistent data formats with national fisheries data collection programs; domestic institutional changes and reporting time lags that disrupt data flow and negatively affect its accuracy; lack of national laws (and sometimes political will) to implement the Strategy and other international instruments; and lack of consistency between RFMO statistical document formats and FAO submission criteria. Additionally, participants expressed concern over instances when reported data did not appear to be accurately reflected in subsequent FAO reporting.

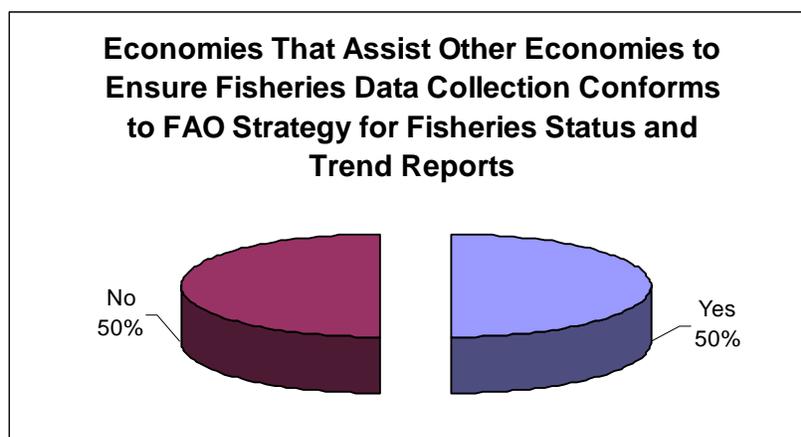
There was general support at the Manado Workshop for future APEC FWG/MRCWG cooperation with FAO and possible project work in this area. It was further noted that the creation of a regional scientific body, such as the International Council for the Exploration of



the Sea (ICES) and the North Pacific Marine Science Organisation (PICES), in South East Asia would be of great benefit to this effort and the region. Finally, recommendation was made that fisheries data collection requirements be adjusted to consider ecosystems rather than political boundaries.



Question 2	Relates to BPA Action: I.a.i (Part thereof)
Does your Economy assist (via capacity development) other Member Economies to ensure that their fisheries data collection method(s) conform to the FAO Strategy for Fisheries Status and Trend Reports?	Build the Capacity of APEC Economies to conform to the FAO Strategy for Fisheries Status and Trends Reports, and increase the number of APEC Economies providing comprehensive data on fisheries to relevant regional fisheries management organisations (RFMOs), including reporting on the impact of fishing.



Interpretation of Quantitative Data

Half of the respondent Economies indicated that they do assist other APEC Economies to ensure that their fisheries data collection method(s) conform to the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries. Others noted that they receive assistance not only from other Economies but also from IGOs, such as SEAFDEC. In one instance, an Economy stated that it had given no assistance because it has received no request for such assistance.

Domestic Initiatives

None reported.

Regional Initiatives

One respondent Economy cited a program to fulfil its responsibility to assist “developing nations” to build capacity to implement “cost-effective and sustainable fishery data collection, data processing, analysis, reporting and exchange of information.” Another noted a funding contribution that it made through a RFMO to a specific bi-lateral data collection program. A developed Economy stated more generally that funding for the purpose of improving fisheries data is made both through RFMO trust funds and directly to developing countries.

A newly emerging Economy observed that it lends assistance to SEAFDEC member countries through the provision of “experts”. However, whilst another Economy also cited SEAFDEC initiatives at data sharing and standardisation, it did not recognise this as ‘assistance’ to other Economies. Another Economy highlighted its efforts of cooperation in the production of fishery-related data on climate and oceanography, particularly as these relate to the El Niño Phenomenon.

**Relevant International Initiatives**

A developed Economy reported that assistance is provided in the course of implementing High Seas Task Force proposals to combat IUU fishing. This Economy observed that monitoring, control and surveillance (MCS) networks can be strengthened through improved access to information and analysis capability. Accordingly, the ability of that Economy to provide training and technical support to fisheries enforcement agencies in developing countries is being improved.

Another developed Economy noted that a sum of \$500,000 has been provided to the UN Fish Stocks Agreement (UNFSA) Part VII Assistance Fund. The funding is to help developing countries who are Parties to the UNFSA build enforcement capacity, undertake scientific research and participate more actively in the meetings and activities of RFMOs. At the time of responding to the survey, that Economy reported that the donated funds had yet to be used.

Discussion of Organisational Perspective (from the Survey of Organisations)

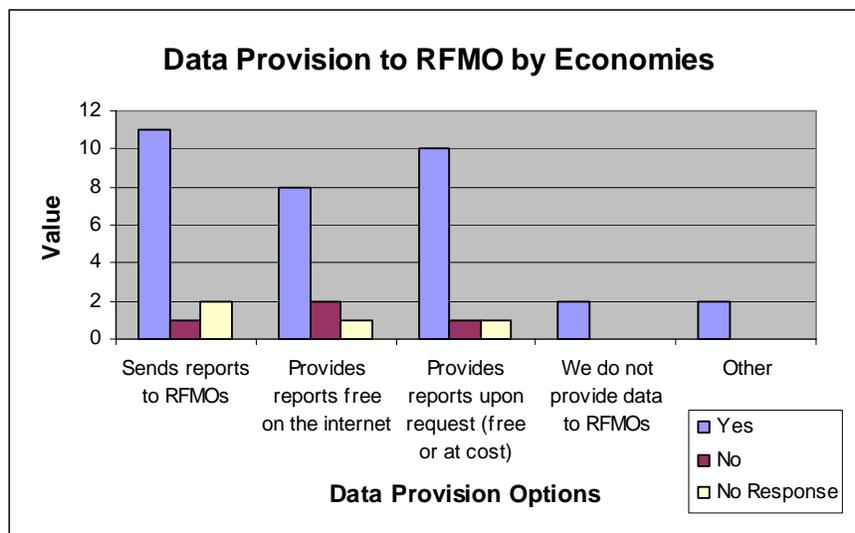
Assistance provided by IGOs or NGOs to member Economies was consistently reported to be generic capacity building, of which the production and dissemination of fisheries data can be understood to be an integral part.

Response Summary

The even division between those Economies that have provided capacity building assistance to other Economies for fisheries statistics production and reporting, and those that have not, appears to correlate with the general categories of 'developed' Economies (that do provide) and 'developing' Economies (that do not). However, in some instances, certain Economies that have not yet reached the status of fully developed nevertheless claimed to have contributed to the capacity of other member Economies in this regard. Interestingly, at the time of the survey, some funding assistance that has been made available has not been drawn down by developing Economies, and in another instance, there was an implied willingness to provide assistance should it be requested, which was said not to have been.



Question 3	Relates to BPA Action: I.a.i (Part thereof)
<p>Please select from the Options available below the means by which your Economy provides comprehensive data on fisheries and reports on the impacts of fishing to relevant RFMOs:</p> <p>a) Send reports regularly to RFMOs b) Provides reports free on the internet c) We do not provide data to RFMOs d) Other –please specify</p>	<p>Build the Capacity of APEC Economies to conform to the FAO Strategy for Fisheries Status and Trends Reports, and increase the number of APEC Economies providing comprehensive data on fisheries to relevant regional fisheries management organisations (RFMOs), including reporting on the impact of fishing.</p>



Interpretation of Quantitative Data

Quantitative responses demonstrate that the majority of Economies do provide regular reports on fishing to RFMOs, and almost as many are prepared to provide such data to RFMOs in response to a request. Half of the Economies that participated in the survey reported that they provide comprehensive fisheries data for free on the internet.

Domestic Initiatives

One Economy amplified the quantitative response to note that reports are raised on a quarterly and annual basis. However, another stated that fisheries records are only for domestic use because the quantities of landings “are negligible”.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

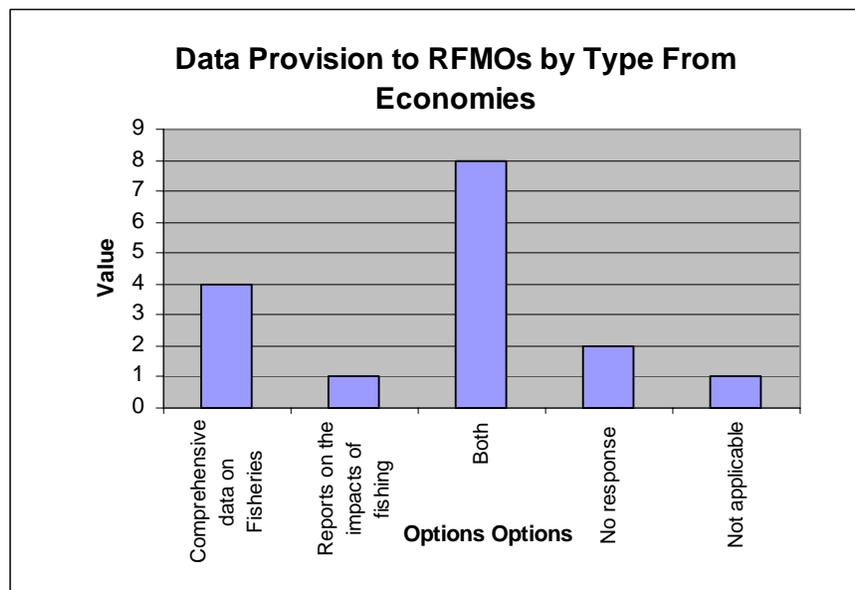
Most of the organisations surveyed did not indicate that they receive fisheries data. However, of the four respondents that did report that they receive fisheries data (two of which were RFMOs), only one clearly indicated that it receives both data on fisheries as well as specific information on the impacts of fishing.

**Response Summary**

The survey response demonstrates a good level of reporting of fisheries data to RFMOs, either directly or through general publication of data on the internet. Three Economies indicated in their qualitative comments that they do not report fisheries data to RFMOs: one because the quantity of fish catch is said to be negligible (although the quantitative response was marked as 'Other'); another stated that data is published freely on the internet (and presumably RFMOs can access it there as required, although this explanation was not given by the respondent); and the third with no explanation given for not sending data to RFMOs.



Question 4	Relates to BPA Action: I.a.i (Part thereof)
<p>If you answered 'Yes', to any option in Question 3, please select one of the three options below.</p> <p>a) Comprehensive data on fisheries b) Reports on the Impacts of Fisheries c) Both</p>	<p>Build the Capacity of APEC Economies to conform to the FAO Strategy for Fisheries Status and Trends Reports, and increase the number of APEC Economies providing comprehensive data on fisheries to relevant regional fisheries management organisations (RFMOs), including reporting on the impact of fishing.</p>



Interpretation of Quantitative Data

The results of this question indicate a good level of data provision by Economies to RFMOs. Fifty percent of Economies that participated in the survey stated that they supply both comprehensive data on fisheries as well as reports on the impacts of fisheries. Four provide fisheries data only, while one declared that it reports only on the impacts of fishing. Two Economies did not respond to the question.

Furthermore, although not given as a formal option in the survey questionnaire, one Economy declared that the question is not applicable. This Economy had observed earlier in the survey that its fishing catch is negligible and that it therefore does not report to RFMOs at all.

Domestic Initiatives

None reported.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

**Discussion of Organisational Perspectives (from the Survey of Organisations)**

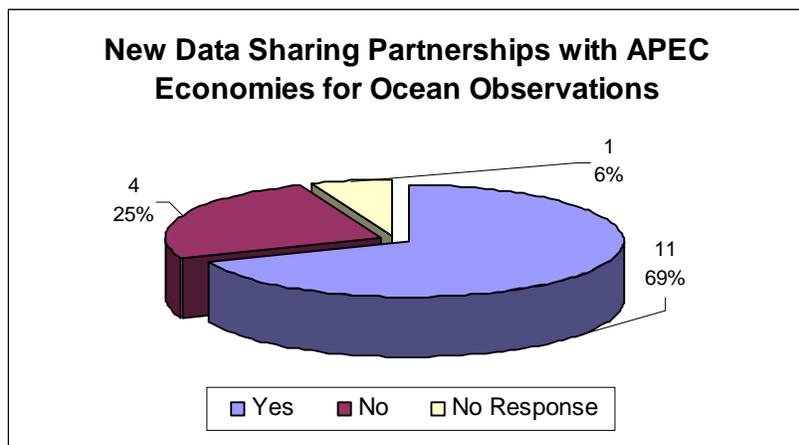
None of the participating organisations reported that they receive data on the impacts of fishing alone. An IGO, that is not an RFMO, stated that it plays a coordinating and capacity building role to enhance the level of fisheries data reporting to RFMOs.

Response Summary

The combined response to the first three options for this question (i.e. send fisheries data; send data on fishing impacts; send both types of data) suggests that the perception of Economies of their level of fisheries related data reporting to RFMOs is strong. Only three Economies did not clearly indicate that they provide RFMOs with fisheries related data.



Question 5	Relates to BPA Action: I.a.ii
Since September 2005, has your Economy participated in any new regional research or data sharing partnerships with APEC Member Economies for Pacific and Indian Oceans <i>in-situ</i> observations to enhance global observations in the oceans and coasts?	Strengthen regional research and data-sharing partnerships for the Pacific and Indian Ocean <i>in-situ</i> observations to enhance global observations in the oceans and coasts.



Interpretation of Quantitative Data

The generally positive response to this question indicates that there has been strengthened effort on collaborative oceans and coastal observation research and data sharing between APEC Economies since 2005. Of the five Economies that did not acknowledge any relevant new regional research or data sharing (four negative, and one no response), three are developing Economies.

Domestic Initiatives

A 'Line-P Time Series Program' was reported to be undertaken at a mooring station in the Pacific by one Economy to record Salinity; Dissolved Oxygen; Nutrients [nitrate, phosphate, silicate]; Chlorophyll; DIC; Alkalinity; C₁₃; DMS; Transmissivity; and surface observations of Temperature; Conductivity (Salinity) and Fluorescence.

Another Economy observed that its national Marine Research Institute is a member of a Committee coordinating a 'National Study of El Niño Phenomenon' (ENFEN).

A 'Voluntary Ship Reporting Program' that involves 45 vessels to measure weather variables that are used in real time for forecasting was cited by the Economy that coordinates the program. That Economy also reported that it has five stations participating in the 'Global Sea Level Observing System' (GLOSS).

Regional Initiatives

One developed Economy reported that it has donated two Argo floats to a lesser developed Economy, and that at the time of the survey, these floats were operational and reporting. This initiative was noted to have served as a catalyst for the recipient Economy to acquire additional floats and to experiment with novel sensors to enhance float capability.

A regional oceanographic initiative called the 'Indonesia Nusantara Throughflow Transport' study was also cited by an Economy, whilst another pointed out that its scientists joined with those of other Member Economies in 2007 to observe the North Pacific Current off the Philippines coast.



The national Marine Research Institute of one Economy reportedly participates with other regional Economies (another one of which is also an APEC Economy) in an 'El Niño Regional Study' (ERFEN) coordinated by the Permanent Commission of the South Pacific (CPPS). This regional initiative was said to involve more than 20 research institutions, which undertake joint research of the oceanographic, atmospheric and biological environment of the South East Pacific. These research institutes were also said to be involved in the 'GOOS Regional Alliance for the South Pacific' (GRASP).

Two APEC Economies were noted to be participating actively (including the use of research vessels) in a bi-lateral experiment called the 'Ocean Cloud Atmosphere-Land Study Regional Experiment'.

Relevant International Initiatives

An 'Integrated Marine Observing System' (IMOS) was reported to have begun in 2007 in order to provide a range of enhancements to *in situ* ocean observations from the Indian, Pacific and Southern Oceans to support oceanographic research. The data from IMOS will be freely available and distributed to APEC Member Economies, primarily via the Global Telecommunications System of the World Meteorological Organisation (WMO).

The co-Chairman of Argo was reported to have served with scientists from a number of Member Economies. Also, a developed Economy reported that training on Argo requirements for delayed-mode quality control was provided to a scientist from a developing country, and that ad hoc monitoring activities were underway in that country. Another developed Economy noted that it has purchased and deployed over 500 Argo floats in the Pacific and Indian Oceans, and that it maintains 9-10 data buoys in the Tasman Sea to collect information on currents, pressure, and temperature for weather analysis.

An Economy noted that it shares sea-level data with other Economies under the 'Pacific Tsunami Warning and Mitigation System'.

Further initiatives involved the deployment of TRITON buoys, and bilateral research involving the deployment of DART buoys, ATLAS climate buoys and tide gauges in the Indian Ocean to enhance *in-situ* ocean observation data. These initiatives were said to have been complemented by attendance by scientists at relevant workshops including the 'APEC International Workshop on the Proposal for the Establishment of a Network for Deep Sea Resources and Fisheries', held in October 2007, and data sharing globally and regionally.

One Economy cited the participation of two of its researchers in "global observation studies in the Pacific and Indian Oceans" undertaken under the lead of another APEC Member Economy.

Another noted that it has increased the exchange of sea-level data with other Economies, and that it contributes to GOOS with weather observations from a fleet of Voluntary Observing Ships and sea level measurements from coastal tidal gauges.

Discussion of Organisational Perspectives (from the Survey of Organisations)

The Organisation Survey revealed that most organisations are not active in supporting *in situ* observations to enhance global observations in the oceans and coasts. Also, where such assistance is given, it is mainly directed regionally rather than towards individual APEC Member Economies.

**Response Summary**

The survey response reflects strong interest at the domestic, regional and international level in improving oceans observation research and data sharing. Qualitative discussion on the type of activities taking place highlights the technical and financially demanding nature of much of this research, and that factor may account for a relatively lower level of commitment to this effort by non-government actors. This factor may also prove to be an impediment for developing Economies to participate actively in *in-situ* ocean and coastal observations.

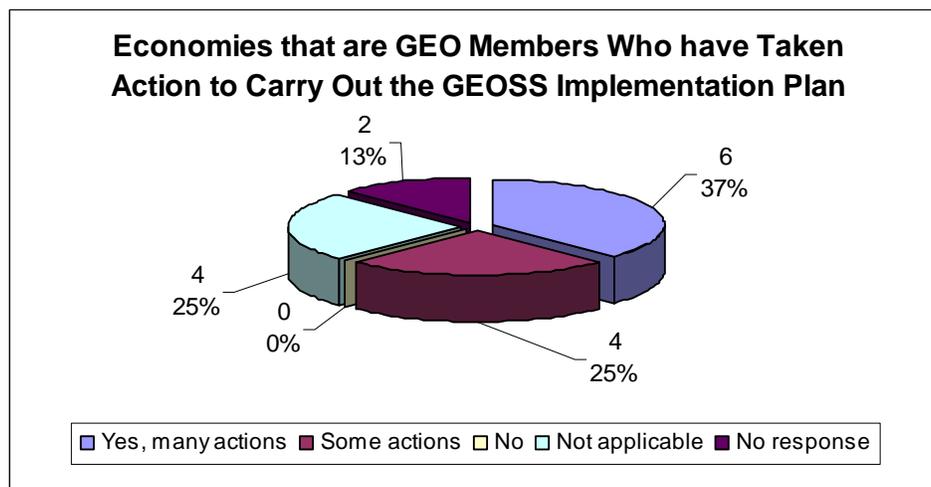
At the BPA Implementation Workshop at Manado in November 2007, participants noted the high level of commitment by many APEC Economies to produce in-situ oceans data but observed that there are often difficulties in channelling information collected into inter-governmental processes. Awareness of existing arrangements among participants was also not strong.

The open, free and unrestricted sharing of ocean and coastal observational data does take place at a national level between certain APEC Economies. However, the survey qualitative data, and comments made at the Manado Workshop, show that the level of participation by Economies in regional and international data sharing is uneven, with some participants at the Workshop expressing security and other concerns. This finding suggests that there may need to be enhanced effort on building awareness of how such data is used for common benefit, and by whom. At the same time, heated discussion at the meeting of the Intergovernmental Oceanographic Commission (IOC) Advisory Board of Experts on the Law of the Sea (ABE-LOS) have highlighted concern by some States that the sovereign rights and jurisdiction of coastal States needs to be respected in the course of collecting ocean observational data. The possibility that such data may have application for submarine operation and marine living resource exploitation may underlie strong assertions that draft IOC Guidelines for the Argo Float Program must respect exclusive sovereign rights and jurisdiction over exploration and marine scientific research in exclusive economic zones and territorial seas. This remains an area of contention that will need to be resolved before stronger commitment to oceanic float data collection programs can be expected, especially from certain developing coastal States.

Interestingly, the only qualitative discussion on coastal observations cites the installation of tide gauges. None of the respondents discussed 'sharing data' on matters such as erosion and accretion monitoring, mangrove depletion, coral bleaching, marine water quality data etc.



Question 6	Relates to BPA Action: I.a.iii
If your Economy is a member of Group on Earth Observations, has your Economy taken action to carry out the Global Earth Observation System of Systems (GEOSS) implementation plan?	Encourage the relevant APEC Economies to participate in the Group on Earth Observations (GEO) and carry out the Global Earth Observation System of Systems (GEOSS) implementation plan.



Interpretation of Quantitative Data

More than half of the respondents reported that they have taken actions to implement the GEOSS Implementation Plan. Four Economies stated that the question is not applicable to them, and all of these elaborated with the observation that they are not a member of GEO. Whilst a 62% confirmed participation rate in GEOSS is significant, there appears to be considerable disparity between the extensive actions being taken by some Economies and the complete lack of action by others. This suggests scope for greater collaboration and possibly awareness building.

Domestic Initiatives

A developed Economy stated that, for domestic purposes, its fisheries and oceans ministry has developed a "Service Oriented Architecture" approach to providing ocean information and data, and observed that this is also the approach that GEOSS is pursuing to build the system of systems.

Another developed Economy declared strong commitment to the establishment of GEOSS, and noted its overall coordination of national activities to integrate Earth observation systems. Such commitment was reflected also by another Economy, which noted that its 'National Oceanographic Research Institute' is developing a strategy to participate actively in GEOSS.

An Economy that is a strong participant in the GEOSS initiative cited the following activities that it has taken to implement the GEOSS:

- promoted satellite data / imagery use for societal benefit through new initiatives (GEONetcast);
- developed plans for air quality, disaster reduction and drought integrated observations early warning systems;
- identified requirements and developed plans for data management and architecture, sea level observing and land imaging; and
- set up a GEO 15-member inter-agency structure.



Regional Initiatives

A developed Economy reported that it maintains “significant observing system components for atmospheric and ocean observations in both the Pacific and Indian Oceans under both the Global Observing System (of WMO) and the Global Ocean Observing System (GOOS)” (of the Intergovernmental Oceanographic Commission), and that actions are being undertaken through national and regional work on the relevant GEOSS component systems.

Another developed Economy observed that it has made no official commitment to the GEOSS program; however, has conducted numerous GEO workshops that have a reporting mechanism for GEOSS, and that its national science institute participated in these workshops. Yet another developed Economy claimed that it “takes the lead in global activities that aim to provide higher-level socio-economic benefits through comprehensive, coordinated Earth observation systems and cooperating with Asian and Oceania countries”.

A developing Member Economy stated that it has hosted meetings of INSTANT, IOGOOS, and INAGOOS, and that it conducts research and surveys in the Indian and Pacific Oceans. Another cited its contribution of an Argo buoy to the global data collection effort.

Participation in a regional alliance for GOOS (i.e. GRASP) was cited by another Economy, along with its efforts to operate an extended net of oceanographic coastal stations and ocean buoys complementing the TAO array in the Pacific Ocean. These stations and buoys were reported to be able to transmit real-time data for different applications, including: tsunami warning, storm waves forecast and El Niño forecast and monitoring. This data was said to be available on the internet. That Economy also reported that its fisheries authority operates a coastal biological buoy that transmits real-time data, and that it conducts an average of four oceanographic and fishery survey cruises each year. A ‘System of Environmental Information’ was reported to use this information together with satellite and remote sensing data.

Relevant International Initiatives

One Economy declared that it is a “major contributor” to GEOSS, and that it currently Co-chairs the initiative. In this regard, that Economy reported that it has expanded partnerships with industry, academia, government, NGOs and international organisations. It has also held workshops on topics such as air quality, public engagement, integrated ocean observing, seismology, earth observation systems architecture, managing risk, remote sensing, biodiversity, and human health.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Almost all of the surveyed organisations reported no activity in relation to GEOSS. This outcome was consistent generally with a low level of participation in ocean and coastal observation data collection by non-government actors. However, one research institute reported participating in the deployment of ARGO Buoys in the Southern Ocean.

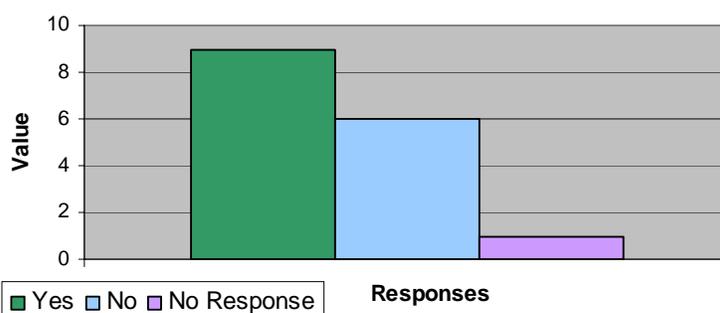
Response Summary

GEOSS is developing rapidly, and the survey has revealed good levels of participation by APEC Economies. However, the qualitative data suggests that the level of understanding and commitment across APEC Member Economies is uneven. The GOOS initiative has helped to strengthen interest and commitment to the coastal and marine dimension of GEOSS, but there remains a need to strengthen understanding of the contribution that can be made by coastal and oceans observational data. Although considerable regional and bilateral activity appears to be taking place, particularly on meteorological and climatic sciences, there has been no comprehensive or integrated approach put in place to engage and link potential GEOSS user groups in the APEC region. Interestingly, none of the survey respondents mentioned the GEO Chlorophyll Global Integrated Network (ChloroGIN) project or the GEO Coastal Zone Community of Practice (CZCP) concept, which may also reflect a limited understanding by Economies of the potential applications and benefits of GEOSS.



Question 7	Relates to BPA Action: I.a.iv
Since September 2005, has your Economy provided or received any additional technical cooperation, assistance or capacity building to implement the Global Ocean Observing System (GOOS)?	Increase technical cooperation, assistance and capacity building to enable relevant APEC members to implement the Global Ocean Observing System (GOOS).

**Provided or Received Technical Cooperation,
Assistance or Capacity Building to Implement Global
Ocean Observing System**



Interpretation of Quantitative Data

Although a majority of respondents did report that they have either provided or received assistance with implementation of GOOS, almost 40% did not. This result is consistent with the spread of qualitative comments, which reflected good levels of activity by some Economies and silence on the topic by others.

Domestic Initiatives

A developing Economy noted that it has received capacity building assistance from two ocean-related agencies from developed Economies. However, a newly emerging Economy observed that it has not received any assistance and commented that “the number of researchers in (the Economy) involved in Global Ocean Observing System (GOOS) is not that many. (This Economy) is still in the process of building up our own group of experts relating to GOOS and similar type of research”.

Another developing Economy reflected a similar resolve to develop capacity independently and observed that its academic institutions “are working to form a national system to observe its oceans; the institutional agreements on it exist only at the national level.”

Regional Initiatives

A developed Economy observed that it provides financial and other support through its national meteorological bureau to Indian Ocean GOOS and Pacific Island GOOS, and that both of these GOOS regional alliances provide capacity building to agencies in APEC Member Economies.

A developing Economy noted that it is a member of a regional alliance for the GOOS program (i.e. GRASP), and participated in the development of an Action Plan for that regional alliance. It stated that the GOOS internet webpage displays a link to data from the automated coastal stations of that Economy. The Economy proceeded to state that “Not relying on this additional cooperation for the system of Observation of Global Ocean. The *problem is for the cost in Licenses and equipments* of calculation for its usage” (emphasis added). This Economy did



not elaborate on the extent to which it has received assistance, if any, to implement GOOS.

Another Economy implemented a capacity building program on oceanographic data management through IGGOOS and IODE.

Relevant International Initiatives

One Economy highlighted its provision of funds to the IOC Trust Fund for the observing system, along with contributions to the IOC-Argo Info Centre, IOC-ITUS Tsunami Fund, and the IOC-UNEP Assessment of Assessments.

In addition, that Economy reported involvement with the International Ocean-Colour Coordinating Group (IOCCG), which is made up of an international committee of experts comprising representatives from both the provider (space agencies) and user communities (scientists and managers) of ocean colour technologies. The IOCCG was reported to have a strong interest in capacity building, and was said to conduct and sponsor advanced training courses on applications of ocean-colour data in developing countries.

A developed Economy noted that it has provided extensive training and technology transfer, including:

- a total of eight training courses on NEAR-GOOS Data Management;
- a GLOSS training course on Sea Level Observation and Analysis;
- a NEARGOOS-NOWPAP training course on Remote Sensing Data Analysis; and
- the provision of a numerical storm surge prediction model to two developing Economies.

A novel initiative was reported by an advanced Economy that has deployed climate moorings in the central and eastern Indian Ocean using the research vessels of other Economies in exchange for providing capacity building training and education workshops on the socio-economic applications for these new data for agriculture, climate risk management, and fisheries.

That same Economy also highlighted its technology contribution to other observation networks, including DART buoys, and tide stations for tsunami early warning and sea level monitoring.

Discussion of Organisational Perspectives (from the Survey of Organisations)

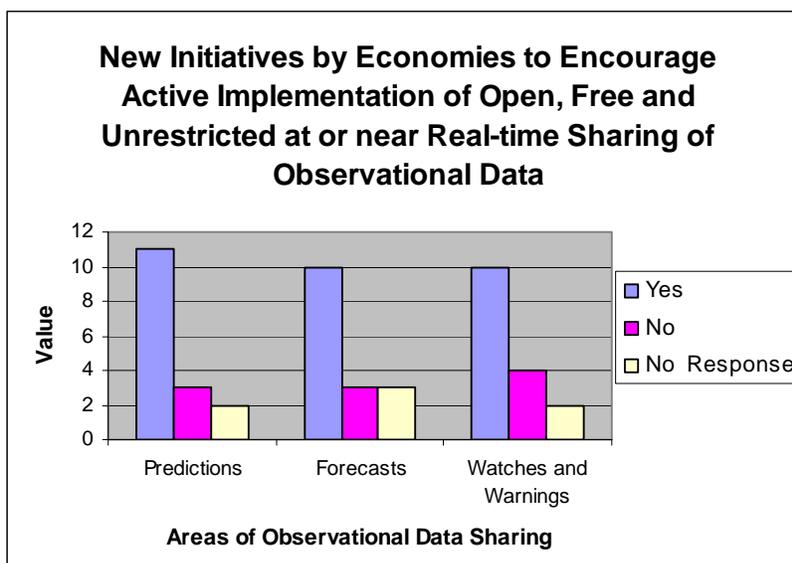
Although participation by non-government actors in initiatives to collect ocean and coastal data is generally low, there is more activity reported in association with GOOS than for either GEO or GEOSS. The nature of GOOS activities by organisations focuses primarily on the use of GOOS data or participation in workshops. However, one organisation noted that it had participated in development of the coral reef component of GOOS.

Response Summary

Importantly, the GOOS program has been running since 1991 but the question specifically sought to identify whether levels of assistance have increased since declaration of the BPA in 2005; therefore, a negative response need not mean that no assistance involving these Economies has occurred. Rather, on the contrary, it could reflect that healthy levels of assistance were already in place and have continued. However, if that were the case, at least some comments to that effect might reasonably have been expected but none were offered. Therefore, the survey results tend to suggest that there is scope for increased technical cooperation, assistance and capacity building in support of GOOS implementation.



Question 8	Relates to BPA Action: I.a. v
<p>Since September 2005, has your Economy taken any new initiatives to encourage more active implementation of open, free and unrestricted at or near real-time sharing of observational data, for any of the following consistent with international obligations and domestic legislation?</p> <p>a) Predictions b) Forecasts c) Watches and warnings</p>	<p>Promote more active implementation of open, free and unrestricted, and at or near real-time sharing of relevant observational data for predictions, forecasts, watches and warnings, consistent with international obligations and domestic law.</p>



Interpretation of Quantitative Data

The quantitative response to this question indicates a high level of activity by Economies to improve the exchange of observational data for prediction, forecast, and watches and warnings. Paradoxically, although relatively few respondents offered qualitative elaboration for this question, several of those that did do so cited activity associated with tsunami warning; however, the quantitative result shows data exchange for the purpose of ‘watches and warnings’ to be slightly less active than for prediction and possibly less active than for forecasts.

Domestic Initiatives

An Economy noted the involvement of its Civil Defence agency in a domestic Tsunami Working Group (TWG) to develop alerting capability. The representatives of the TWG include Defence, emergency and scientific groups.

Regional Initiatives

Importantly, a developed Economy observed that “there have not been any new initiatives since September 2005, but (the Economy) has operated the NEAR-GOOS regional real-time database, which provides open, free and unrestricted access of real-time observational oceanographic data and results of oceanographic analyses, since 1996 for a variety of applications including predictions, forecasts, and watches and warnings”.

The Operations Unit National Manager of the Civil Defence agency of an APEC Economy is



Chair of the International Coordinating Group / Pacific Tsunami Warning System.

Relevant International Initiatives

One Economy stated that it has “always promoted such kinds of sharing” and will “continue to encourage greater sharing of observational data”.

Daily bulletins of sea-surface temperature (SST) and SST Anomalies data from the coastal stations of an APEC Economy were reported to be available on the webpage of its national Fisheries Institute. Also, the Economy observed that watches and warnings on environmental extreme conditions are published on the internet website of its hydrography and navigation/meteorology agencies.

Discussion of Organisational Perspectives (from the Survey of Organisations)

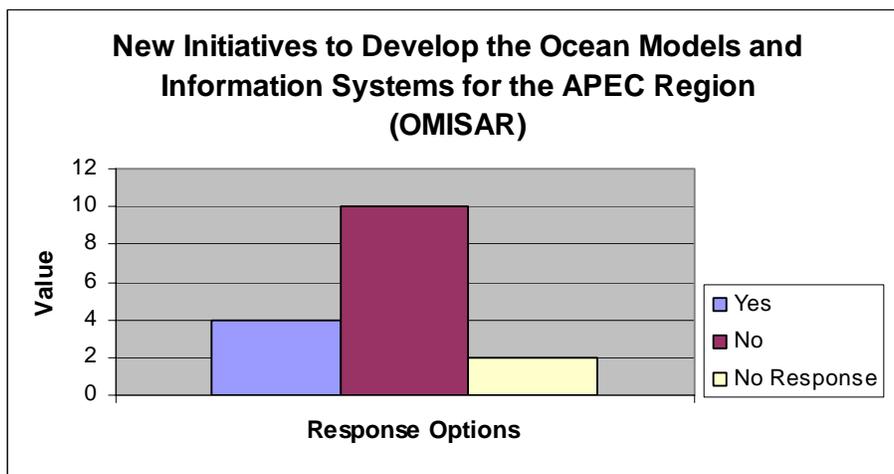
The Organisation Survey responses, and associated qualitative data, suggest that this is not an area of activity that has attracted the attention and effort of non-government actors. Some initiatives were reported that reflect enhanced collaboration between research bodies, and an important effort to improve the legal framework for sharing oceanographic data was noted. This was stated to be occurring through an IGOs involvement in the ‘IOC/Advisory Body on the Law of the Sea’. However, in the main, activity by organisations on this BPA Action Item is low.

Response Summary

One Economy specifically noted in its qualitative response that there have not been new initiatives since declaration of the BPA in 2005. Nevertheless, that Economy expressed satisfaction in its provision of open, free and unrestricted access to real-time observational oceanographic data and analysis results. Therefore, although 30-35% responded negatively to this question, such a response may well reflect the absence of ‘more active implementation’ by these Economies as called for in the BPA, not the absence of activity. However, a majority of Economies did report that they have been more active in this aspect of BPA implementation since 2005. Nevertheless, new initiatives using innovative technology that was not yet developed in 2005, have been undertaken at the national level with data shared openly on the internet.



Question 9	Relates to BPA Action: I.a. vi
Since September 2005, has your Economy undertaken any new initiatives to help develop the Ocean Models and Information Systems for the APEC region (OMISAR) as part of a regional contribution to GEOSS?	Further develop the Ocean Models and Information Systems for APEC region (OMISAR) as part of a regional contribution to GEOSS.



Interpretation of Quantitative Data

There is little evidence that the OMISAR initiative has been taken up comprehensively by APEC Economies. A small group of Economies appear to have taken the lead in promoting the idea, but even they did not report activity since late 2005. Nevertheless, new initiatives using innovative technology that was not yet developed in 2005, have been undertaken at the national level with data shared openly on the internet.

Domestic Initiatives

One Economy noted that the OMISAR initiative is coordinated by the environmental protection agency of another Economy, and that the project has consisted mainly of workshops to exchange experiences. Although the Economy that made this comment monitors progress, they have not participated in the OMISAR project, and stated that “we keep abreast of ocean modelling through WMO activities”.

Another Economy which reported inactivity with OMISAR, cited its role in developing the BLUElink ocean forecast system, which became operational in August 2007. The system was reported to be able to provide analyses and predictions, freely via the internet, out to 7 days on a range of oceanic conditions for the Australasian region, encompassing “a significant part of regional seas in SE Asia, SW Pacific and (the) Indian Ocean”.

Regional Initiatives

Three APEC Economies were reported to have collaborated in sponsoring two workshops, one each in September and November 2005, in support of the APEC OMISAR project. These three Economies, along with one other, were said to be conducting a ‘Satellite Application in Knowledge-based Economies’ project to apply high-resolution satellite imagery information for marine protection.

**Relevant International Initiatives**

A newly emerging Economy that has not participated in OMISAR stated that the reason for its non-involvement is that “the number of local experts that can be involved in such programs are not many”.

A developed Economy noted that it was not able to participate in the November 2005 workshop but that its High Resolution Picture Transmission (HRPT) satellite data was used.

Discussion of Organisational Perspectives (from the Survey of Organisations)

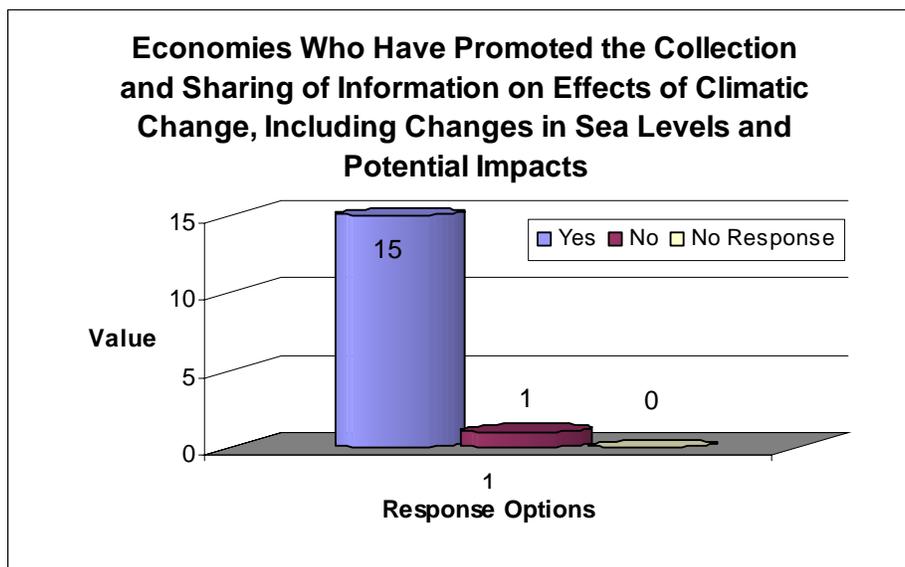
With the exception of a single respondent organisation that indicated awareness of progress in the development of OMISAR, the Organisation Survey indicates that little is known about OMISAR either within or outside of the APEC framework.

Response Summary

At the Manado BPA Implementation Workshop, in November 2007, participants noted that OMISAR activity has declined in recent years and suggested that this could be the result of the emergence of new technology that calls into question the purpose and system envisaged for OMISAR. Nevertheless, the APEC MRCWG was said to be currently developing a project to use OMISAR imagery for aquaculture.



Question 10	Relates to BPA Action: I.a.vii
Since September 2005, has your Economy promoted the collection and sharing of information on the effects of climate changes, including changes in sea levels and the potential impacts in the region?	Promote the collection and sharing of information on the effects of climatic changes, including changes in sea levels and potential impact in the region.



Interpretation of Quantitative Data

An overwhelmingly positive response to this question furnishes strong evidence that there is strong interest by APEC Economies in the issue of climate change, and active effort by them in the collection and sharing of relevant information. The question specifically explored the level of activity that has taken place since September 2005, and the question response, combined with qualitative comment, provides clear indication that much of the activity related to climate change has been recent.

Domestic Initiatives

A developed Economy reported that it maintains a national Baseline Sea Level Array to provide a long-term record of sea level and sea level change. This Economy has also commenced a 'first pass' national assessment of coastal vulnerability to climate change, which is scheduled to be completed by mid-2008. The Economy reported that the assessment will focus primarily on estimating the vulnerability of coastal settlements, infrastructure and ecosystems to the impacts of rising sea levels, changing rainfall patterns and stronger cyclones. Specifically the 'first pass' assessment was said to encompass the following tasks:

- develop and apply a national digital elevation model for the whole coastline of the Economy and where possible link to near-shore bathymetry;
- identify areas in the coastal zone with 'high', 'medium' and 'low' potential impact risk from increased vulnerability to climate change and change in extreme events;
- integrate biophysical and socio-economic analyses to enable decision-makers to understand better the vulnerabilities and potential costs arising from climate change;
- identify knowledge gaps and strategic research needs for coastal vulnerability assessment including system thresholds, interaction between climate events and socio-economic impacts;
- provide analysis of assessments with relevance to national, state/territory and local governments, and strategic direction on priority research and data gaps; and
- have accessible information and products via an online portal.



The outcomes of the 'first pass' assessment will direct work in a 'second pass' national coastal vulnerability assessment. The National Coastal Vulnerability Assessment (NCVA) was reported to be a key project under a 'Framework for a National Cooperative Approach to Integrated Coastal Zone Management' to be conducted within a 10 year timeframe. The NCVA is also a key action under a 'National Climate Change Adaptation Framework', which was adopted by all relevant levels of government in April 2007. The Economy reported that it has also established a national 'Centre for Climate Change Adaptation' to, *inter alia*, co-ordinate the NCVA project.

The establishment of a central body to coordinate activities related to climate change, and a national framework for action, is consistent with the approach taken by another Economy, which set up an 'Interdepartmental Commission on Climate Change' and developed a 'National Climate Change Strategy'. This latter Economy also reported that its 'National Institute of Ecology' conducts studies on adaptation and vulnerability to climate change for coastal areas (including the dynamics of extreme hydro-meteorological phenomena).

However, such a centralised approach differs from that of another Economy that delegates responsibility (by law) for planning and environmental management to local government. In this case, the role of central government was said to be confined to the provision of information, tools and guidance to help local government assess the risks of climate change, including: a risk-based decision-making framework, case studies, impacts information, practical checklists, technical reports and guidance manuals.

Within the past year, another Economy established a Centre of Ocean Modelling Development and Application (COMDA) to provide guidance to the distributed expertise and requirements for ocean model applications. Also, in 2006/07, this Economy established an 'Operational Network of Coupled Environmental Prediction Systems', which is known by the acronym 'CONCEPTS'. An inter-agency cooperative effort between three government agencies (environment, fisheries and Defence) is being developed under the CONCEPTS initiative to develop operational oceanographic products that can be provided by an operational global-coupled atmosphere-ocean-ice data assimilation and prediction system. To accelerate this outcome, the Economy is cooperating with a European country to adopt, import and participate with their Operational Ocean Data Assimilation and Modelling System.

A project-oriented approach was reported by another Economy, which launched a two-year study commencing in March 2007 on the long-term effects and impacts of climate change. The study will investigate effects such as changes in sea level, temperature, rainfall and wind, and how these could cause impacts such as coastal erosion, flooding and slope stability.

Another Economy observed that it has focused on raising awareness of climate change. Its national Observatory was said to have revamped and enhanced its web page on climate change substantially to share data through the internet; produced an education package for all of the Economy's schools; enhanced an outreach program to introduce climate change concepts and personal responsibility in the mitigation of climate change; and actively promoted public awareness via the media. Another Economy also noted that data on climate change and sea level variation is made available freely through the internet.

A developing Economy stated that it has produced several guidelines on mitigation and adaptation for marine disasters and sea level rise. That Economy was also reported to have organised an annual workshop on 'Management of Potential Conflicts in the South China Sea', which another Economy cited as a forum that enabled it to exchange information on the effects of climate change.

The Fisheries Agency of an Economy commissioned "experts and scholars" to collect and present information at a seminar on the impact of climate change on fisheries. Also, another Economy reported that it has used seminars and symposia to disseminate the scientific findings of the IPCC, and that it publishes a 'Climate Change Monitoring Report' each year. The Climate Change Monitoring Report includes the outcome of that Economy's monitoring and analysis of oceanographic conditions, including factors such as: sea surface temperature, sea levels, green-house gas concentrations and marine pollution.



Regional Initiatives

A developed Economy reported that it implements the South Pacific Sea Level and Climate Change Monitoring Project to provide a long-term record of sea level and sea level change at 12 island sites in the western Pacific (to climate quality standards). It also has assisted 10 neighbouring countries (mostly South Pacific Island States) through two projects (the Pacific Island Climate Prediction Project and the Pacific Data Rescue Project) to secure their historical climate data records with a view to establishing a firm base for assessing ongoing climate variability and future climate change. Several South Pacific Island based projects were also reported to be underway, or in the planning phase, to assess the impacts of climate variability on water resources, agricultural productivity and human health.

Also, Basin and regional-scale operational systems are reportedly under active development for the North Atlantic and this initiative is expected to expand to include Pacific and Arctic systems.

One developing Economy noted that it has now submitted “many proposals” related to climate change for funding and possible collaboration.

Relevant International Initiatives

An Economy highlighted its contribution of sea-level data to the Global Sea Level Observing System (GLOSS) and the University of Hawaii Sea Level data Centre. Based on this data, that Economy reported that it has conducted coastal scenario studies in accordance with IPCC guidelines to assess possible socio-economic impacts and identify the most vulnerable coastal areas.

A developed Economy stated that its national oceans agency detects climate phenomena (e.g. El Niño, Indian Ocean Dipole, Pacific Decadal Oscillation) and supports programs such as the Pacific Islands Global Climate Observing System. Furthermore, that Economy highlighted the participation of its nationals as key experts on the IPCC that provided the April 2007 report on climate change impacts, adaptation and vulnerability. This Economy stated that it has co-sponsored APEC projects that, if they had been funded, would have addressed the collection and sharing of climate change information.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Although four organisations indicated in the Organisation Survey that they conduct programs researching the effects of climate change and sea level rise, there was only limited elaboration, and in each case the elaboration was made by an IGO rather than a non-government actor. On this limited data, we can suspect that the expense and technical demands of climate-change research may be a barrier to participation for many non-government entities.

Response Summary

The depth and breadth of activities related to climate change reported by Economies is consistent with the positive response of more than 90% to this question. Activities have included: directed research; hosting of workshops; climate observation programs; sea level measurement programs; guidelines, checklists and reports for coastal management (e.g. local government and coral reef managers); public awareness and education programs; vulnerability studies; institutional restructuring to create focal points for coordination; and more.

However, the BPA Implementation Workshop at Manado in November 2007, participants commented that there is still scope to improve understanding of the current science related to climate change and the marine/coastal environment, especially in the context of the APEC region. Suggestion was made that a stronger association between the APEC working groups and organisations such as PICES could help to address this.

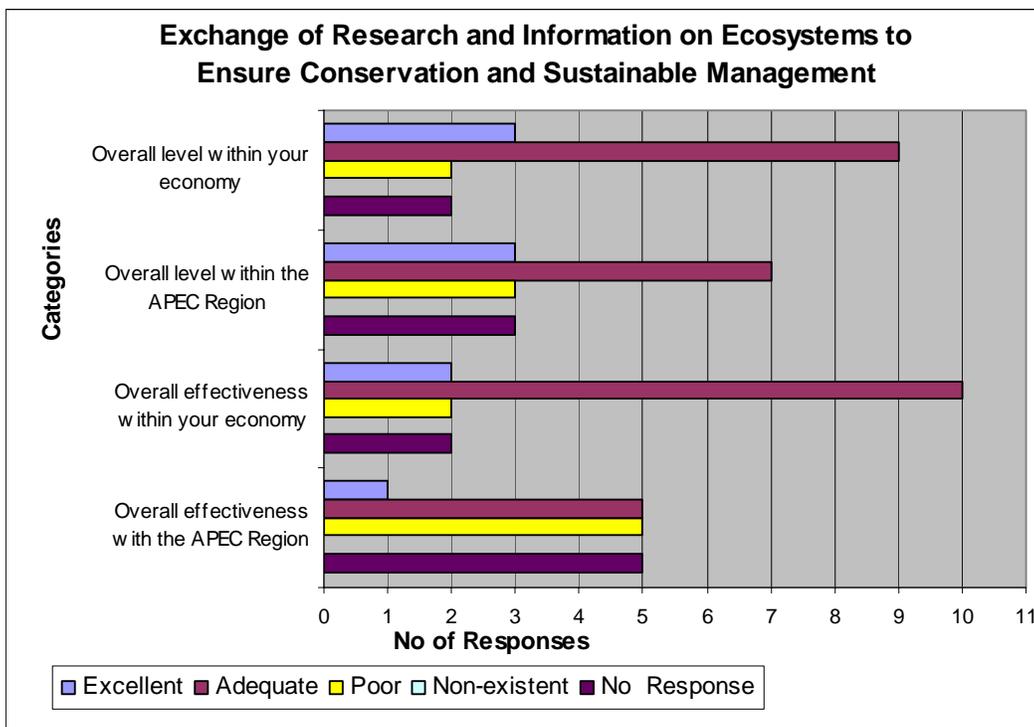


This BPA Action Item, and survey question, focuses on “the collection and sharing of information on the effects of climatic changes ...”. However, the Manado Workshop participants observed that there would now appear to be a need to expand emphasis beyond a narrow scientific focus on climate change issues into policy discussions.

At a joint meeting of the APEC Marine Resources Conservation Working Group and Fisheries Working Group at Piura, Peru in April 2008, the issue of oceans acidification was raised and the need for further research on the important issue noted. Also, a report in February 2008 by one developed Economy observed that observational data used in the IPCC report of 2007 was current only to 2006 at the latest. However, more recent data was shown to reveal that global carbon emissions trends have worsened since the year 2000. Certain of the more moderate scenarios outlined by the IPCC have already been overtaken by actual emissions that are currently tracking at higher levels than the worst-case ‘business-as-usual’ scenarios of A1F1. The report issued by the Economy concluded that the inputs of climate change are therefore likely to be more severe and felt much sooner than assumed in the planning and scenario setting of member Economies as reflected in the survey response.



Question 11	Relates to BPA Action: I.a.viii
With regard to the exchange of research and information on ecosystems to ensure conservation and sustainable management, how would you rate: i) overall level within your Economy? ii) overall level within the APEC region? iii) overall effectiveness within your Economy? iv) overall effectiveness within the APEC region?	Exchange research and information on ecosystems to ensure conservation and sustainable management.



Interpretation of Quantitative Data

The survey responses reveal overall satisfaction with the level and effectiveness of exchange of research and information on ecosystems within the respective Economies. Slightly less satisfaction was expressed about the level of such information exchange within the APEC region; whilst much less satisfaction was expressed about the overall effectiveness of research and information exchange within the APEC region.

Domestic Initiatives

i) Overall level within your Economy? Ecologically sustainable development was reported by one developed Economy as a founding concept of that Economy’s natural resource management framework. The Economy also noted that fisheries and ecosystem research contribute to a number of fora to build knowledge, assist researchers and form policy. Research findings were said to be communicated through refereed publications, grey literature, web data and email. Legislative requirements were cited as a factor to ensure that such information is taken into the public domain. This Economy also reported that it has a marine bio-regional planning process, which involves the exchange of research to develop comprehensive marine profiles that bring to one place all knowledge about conservation values, uses and threats. Bio-regional profiles were said to be underpinned by scientific



research as well as scientific workshop outcomes.

One emerging Economy stated that there are many public agencies and organisations conducting research and collecting information on sustainable ecosystem management, and most of the information is available on the internet where information can be freely accessed and shared.

The following range of integrated management mechanisms were reported by a developed Economy:

- nineteen eco-regions have been identified "...which serve as a reference for ecosystem-based ocean management decisions";
- within the eco-regions, integrated management processes have been initiated for five large ocean management areas (LOMA), where scientific research is being done to help develop management objectives with stakeholders, including the identification of ecologically and biologically sensitive areas (EBSA);
- ecosystem overview reports have been produced for the five LOMAs describing the status and trends of biological and physical ecosystem aspects; and
- EBSAs that are sensitive to particular threats are identified for special management consideration.

Another Economy reported a number of regionally focused initiatives, but at the domestic level, stated that effort is just beginning on a coordinated and structured framework for sustainable coastal and marine development. Examples cited include: publication in 2006 of a national environmental policy for the sustainable development of oceans and coasts; the implementation of a national strategy for ecological development of marine and coastal territories, which includes pilot projects towards region-wide implementation; and direct progress with relevant territories surrounding a major marine ecosystem to implement a marine ecological development program, where work to study ecological functions and structure is now beginning.

One developed Economy stated that the ecosystem approach is being incorporated increasingly into the conservation and sustainable management framework, and that exchange of research and information on ecosystems continues to improve. An emerging Economy also noted that information is obtained through meetings, workshops and seminars and is available online. Another Economy explained that "basic information on marine ecosystems (i.e. Tidal flats, Seagrass beds) is exchanged among research institutes, universities, and government at the local and national level and with NGOs, and that such information is provided for the public in reports and on the internet.

A further Economy reported a range of actions at all levels where information and research on the marine environment, biodiversity and fisheries is provided at the domestic level for decision-making outcomes. Research resources reported to be at the disposal of this Economy included: eight research ships (near-shore and oceanic); modern facilities; and seven coastal laboratories etc. Research areas include: physical, chemical and biological oceanography; evaluation of low-income populations; fisheries resources; biodiversity; climate research; and erosion and sediment research for developing holistic sustainable management outcomes.

An Economy observed that it has "an informal network of biodiversity research groups, comprising research and academic institutes...government agencies, NGOs and individuals". Whereas another developing Economy stated that it relies on NGO conservation and sustainable management initiatives, of which there were said to be many. The relative inexperience implied in reliance on NGO programs was reflected also in the comments of another developing Economy, which declared frankly that it has a lack of experience.

(Note: A number of Economies used this question to elaborate on a range of ecologically sustainable marine projects, initiatives and programs either established or about to commence, as a means to demonstrate the level of research and information exchange both within an Economy and at regional and international levels.)



ii) Overall level within the APEC region? A developing Economy stated that within the APEC region the overall level of research and information exchange is excellent, whilst an emerging Economy stated that there “are healthy collaborations between our scientists and those of the APEC Region”.

Until recently, coordinated research and information exchange at a national level was noted to have been limited by one emerging Economy. This was said to have resulted in the “formation of a Commission in 2007” to start the process of coordinating and optimising marine ecosystem research generated from many national and regional research institutions.

A developing Economy reported the belief that there is “a lack of communication” with regard to ecosystem management within the APEC region. This sentiment seemed to be shared by a developed Economy, which reported that “there is no comprehensive framework for exchanging research and information on marine ecosystems among APEC Economies”.

iii) Overall effectiveness within your Economy? A developed Economy stated that it has “...well established processes and mechanisms...” that are considered to be effective. An emerging Economy reported that “exchanges with researchers in local universities are frequent and ties are close...[and that] the concept of conservation and sustainable management of ecosystems has been well received”. Another emerging Economy reported that “based on the size of the Economy, the informal network serves its purpose adequately”.

Another developed Economy declared that “rapid progress is being made [and] extensive ecosystem information is being collected in all LMEs”, also that integrated ecosystem assessment has been adopted as a primary tool. However, this Economy reported that the network to exchange information effectively is still being developed. An emerging Economy cited an “observation strategy and research programs...[to determine suitable information] and that this support[s] current strategies for climate monitoring and prevention of climate hazards...as well as [for] fisheries management”. Furthermore, another emerging Economy reported that the exchange of information among agencies is good and that all “...government agencies are working together for the common good of the country”. Whilst another Economy said that collective research provides for conservation and sustainable management, including for MPA and policy development.

One developing Economy observed that “...marine regions are not studied uniformly; [and that] more research effort is made in regions with greater economic development and more resources...”. Another developing Economy cited a need for more expertise to be involved in this field.

iv) Overall effectiveness within the APEC region? A re-occurring theme evident in the responses of one developing Economy was that it believes there to be a lack of relevant communication between APEC Economies. A developed Economy also stated that “there is no comprehensive framework for exchanging research and information on marine ecosystems among APEC Member Economies”. An emerging Economy reported that it was “unsure as to how effective information exchange have been within the region [and that] information exchange within APEC should be further enhanced in particular among projects that are being implemented”. A developed Economy observed that in “terms of effectiveness...there is a wide gap between the most and the least effective Economies, indicating poor effectiveness”.

There are still challenges as noted by another developed Economy, in “broadening paradigms to use ecosystem information to inform management, [and that there are] still challenges in establishing broad ecosystem observing systems, at the national and regional (LME) scale that can collect the diverse information required to effectively support an ecological approach to management (EAM)”.



Regional Initiatives

i) Overall level within your Economy? One emerging Economy reported the “establishment of trilateral cooperation is based on bioeco-regional” areas. That Economy also said that it has been involved in the initiation and development of the Coral Triangle Initiative (CTI). A developing Economy reported that there are a number of coastal/marine projects, some financed by GEF at the local and regional levels, on behalf of which it cooperates with at least one other developed Economy, particularly with regard to reef system ecological areas.

Another Economy reported that, in addition to a wide range of actions at the domestic level, further effort is needed on oceanographic research at a macro-scale to comprehend the seasonal and inter-annual variability impacts on climate, biology and fisheries. That Economy noted that it participates widely in information and research exchange at the national, regional and international levels.

A developed Economy reported that data on fisheries, protected resource assessments, ecosystem surveys, oceanographic data, coastal health indicators, and habitat assessments are analysed at the regional ecosystem level and findings are exchanged freely “...at the local, state, national and international levels”. This Economy also observed that, at the national level, there is a growing level of commitment to an ecosystem approach to management.

ii) Overall level within the APEC region? One Economy reported that it exchanges information through inter-regional participation in two Large Marine Ecosystem Projects. While an emerging Economy reported that it works closely with another Economy on joint assessments of certain fish stocks, through which scientific information and advice is provided to each respective government for decision-making. A developed Economy reported sharing information and research that it collects with three other Economies who share the same LMEs, and that “basin-scale research in the North Pacific is conducted through cooperation with other PICES Member States and through numerous bilateral science agreements”.

An emerging Economy reported involvement in the APEC review of “...water quality criteria or standards adopted in the Asia Pacific Region”, for which information was disseminated at the 20th MRCWG Meeting, and shared with some developing Economies outside of APEC under another project. This Economy also stated that research is exchanged through several local research centres, and that fisheries information is mainly exchanged with another close Economy but only infrequently with other Economies. A developed Economy acknowledged a degree of information exchange between Economies, either on an ad-hoc or more formal basis, but observed that information is scattered and not easily available to policy-makers. A developing Economy reported that information exchange is primarily conducted through IGO projects on marine conservation and sustainable management.

A developed Economy reported that information is exchanged in the region through collaborative projects between that Economy and others; for example, the implementation of ecosystem-based sustainable management plans. That Economy also observed that information exchange occurs through the development of a Regional Plan of Action (RPOA) ‘To Promote Responsible Fishing Practices including Combating IUU Fishing in the Region’. Finally, this Economy noted that “substantial information is shared” through RFMOs, which is used to inform management decisions.

iii) Overall effectiveness within your Economy? Nothing reported.

iv) Overall effectiveness within the APEC region? Although a developing Economy cited poor performance with regard to the exchange of ecosystem research and information within the APEC Region, it did highlight progress through active participation in global and regional fora, and noted that it has signed several relevant multilateral cooperative agreements. The most concrete progress was said to be in the field of environmental planning, where a marine development program for the Gulf of California has been released.

In relation to a RPOA on fishing, one developed Economy stated that “information and research mechanisms have proven effective in that there has been a high level of



participation by most member countries". However, this Economy also recognised that "...there is scope to improve the information flow within and between RFMOs and [that] there are several initiatives in train to facilitate this, including resolutions for members of these organisations to share data and work collaboratively to improve knowledge of the ecosystems and their functions...".

Relevant International Initiatives

i) Overall effectiveness within the APEC region? An emerging (and apparently very active) Economy reported that international fora on marine pollution, eco-toxicity, aquaculture, and biological indicators, etc. have been held by this Economy with active participation by officials, scientists and managers from around the world. Another Economy reported that it is part of an international network on marine conservation.

ii) Overall level within the APEC region? Nothing reported.

iii) Overall effectiveness within your Economy? Nothing reported.

iv) Overall effectiveness within the APEC region? A developed Economy reported that a January 2006 Meeting of Tuna RFMOs recognised a need to improve information supply to RFMOs from member countries, and between RFMOs under regional initiatives.

Discussion of Organisational Perspectives (from the Survey of Organisations)

A total of 57% of respondent organisations stated that they directly undertake research of marine ecosystems. The three areas of primary interest to the participating organisations were reported to be: marine biodiversity management; anthropological impacts on marine ecosystems; and coral reef ecosystem management. Qualitative data suggests that some of this research is done in association with governments and some also with local communities, thus suggesting that these organisations may be contributing directly to implementation of this BPA Action Item.

Section Summary

Participating Economies provided considerable elaboration on their quantitative survey responses for this question. Whilst specifics of the examples cited differ for the various Economies, the overall trend corroborates the quantitative data, in that Economies cite numerous positive examples of ecosystem research and information exchange from within their Economy, and express less satisfaction on the matter in the context of APEC as a whole.

Criticism offered of the low effectiveness of information exchange at the APEC level primarily appears to be oriented to two points: first that communication between APEC Economies on ecosystem-based management is poor; and second, that there is no comprehensive framework to facilitate such communication and purposeful liaison within APEC. One respondent emphasised the contribution made by RFMOs to facilitate information exchange; however, another cited a 2006 conclusion by tuna-related regional RFMOs that exchange of information from Economies to the RFMOs, and between RFMOs, needs strengthening. Such equivocal qualitative comment is again consistent with the quantitative data that reveals an evenly split opinion on the adequacy of exchange of research and information on ecosystems to ensure conservation and sustainable management within APEC.

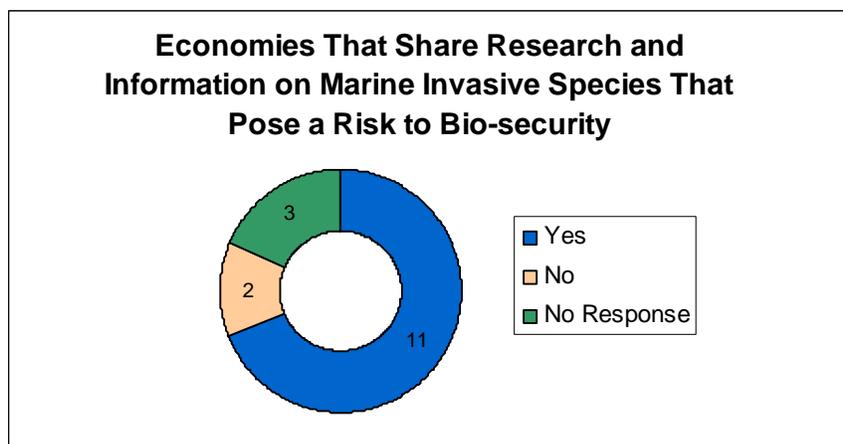
At the Manado BPA Implementation Workshop in November 2007, participants highlighted the potential international and associated domestic legal barriers to the sharing of ecosystem research findings and information. Potentially, these barriers could relate to a desire by Economies to protect their rights over genetic marine resources and to control bio-prospecting. Whilst the *Convention on Biological Diversity* 1992 goes some way to addressing this issue, that treaty must be read in the context also of the *UN Convention on the Law of the Sea* 1982 (LOSC). The LOSC (Part XIII) regarding marine scientific research is especially relevant given the presence of the Coral Triangle within the APEC geographic region, and therefore the likely importance of marine ecosystems as a source of useful genetic material.



Other Economies might also withhold information out of concern for national security. Thus, there remains a potential for Economies to apply an overly restrictive interpretation of the requirement to protect ecosystem information that is perceived to be valuable or sensitive. The Workshop participants noted that there are a number of good models for data sharing in the APEC region, and that these might be compiled as case studies for ease of reference for relevant Economy decision-makers.



Question 12	Relates to BPA Action: I.a.ix
Does your Economy share research and information on invasive marine species that pose a risk to bio-security?	Exchange research and information on those marine invasive species posing a risk to biosecurity in the Asia Pacific region.



Interpretation of Quantitative Data

A large majority of participating Economies indicated that they do “share research and information” on invasive marine species. However, the question does not explore whether the act of sharing for any given Economy is one primarily of providing or receiving research and information. In order to determine any patterns in this regard, the qualitative data provided through Economy elaboration must be examined.

Domestic Initiatives

Reports on research of invasive marine species, prevention and management by a developed Economy were said to be available on request. Alternatively, this Economy stated that some reports were also available on a website. A developing Economy observed that efforts to address invasive marine species have been ongoing since 2000, resulting in the establishment of a national commission that leads efforts to address invasive marine species. Additionally, this Economy is developing a national strategy on the issue.

One emerging Economy reported that to its knowledge, “no work has been done in this area...”. A developing Economy cited efforts that are occurring “within ASEAN region as...[they] share the same water bodies”. Another emerging Economy reported that effort is “...very limited only”. A similar position was reported by another developing Economy, however, it did cite the existence of “...several studies dealing with invasive species related to biosecurity and from aquaculture”.

An Economy reported that since 2003 it has conducted an ongoing study on the “status of invasive marine species inflow through Ballast Water”, and the results are intended to be entered into a data-base by 2009. Upon completion this project, the Economy concerned stated that it will share the information with neighbouring countries, and instigate a bilateral or multilateral meeting to help protect marine ecosystems from invasive marine species in the region.



Regional Initiatives

A developed Economy reported that it shares information on at least one invasive marine species with a neighbouring Economy, due to the extent to which this species has spread over recent years. In early March 2008, agencies from both Economies reportedly collaborated to co-host a joint meeting to address the growing concern over this invasive marine species. That Economy also noted previous meetings for this and another invasive species. Through the established collaboration, these two Economies will likely work on addressing other invasive marine species, where these pose a mutual threat. One other initiative reported by this Economy was the “development [of] a taxonomic experts database to facilitate quick identification of non-native species”.

Efforts of the Environmental Cooperation Commission under NAFTA were reported by a developing Economy, where the commission has a project specifically focused on invasive marine species in collaboration with two other Economies.

A developed Economy observed that a monitoring methodology for detecting marine pests and the development of a risk assessment framework for determining appropriate ballast water and bio-fouling control was developed by several countries. This Economy stated that it “...is interested in accessing overseas expertise in marine pest identification and management and has made available the results of its research...in peer reviewed publications, website and other fora”. The Economy further reported that most research is publicly available, and that it maintains close ties on the issue with at least one other developed Economy. There was said to be fairly extensive information sharing within the Economy on the subject of marine pests.

An emerging Economy reported that a local university is compiling a database on invasive species, and that through an “Interjectorily Commission”, subject material of the IMO is reviewed and evaluated for the purpose of providing advice to decision-makers on necessary actions or the adoption of agreements.

Relevant International Initiatives

A developed Economy stated that it participates in three relevant international scientific working groups; the ICES Working Group on Introductions and Transfers of Marine Organisms; ICES Working Group on Ballast Water and Other Ship-Based Vectors; and PICES Working Group 21 on Non-indigenous Aquatic Species. This Economy also reported that it shares information, and collaborates on invasive marine species and risk assessment activities.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Only three of the fourteen participating organisations in the survey indicated that they undertake any activities related to invasive marine species in the Asia-Pacific Region. The nature of these activities tends to be in a support role (i.e. as advisors on committees, developing guidelines etc) to programs that are driven primarily by Economies.

Section Summary

The qualitative data suggests that there is a correlation between the developmental status of an Economy and the extent to which it conducts research on marine invasive species, provides information on the topic, and develops mechanisms for monitoring and controlling introduced marine pests. In general, developing/emerging Economies noted that they have done little in this area. Another trend in the qualitative data is for developing Economies to cite their association with regional or multi-lateral programs rather than specific domestic initiatives.

Such a division in the nature of activities associated with the sharing of research and information on marine invasive species is intuitively consistent with recognition that the technical demands and high expense that such research may entail will pose barriers to entry

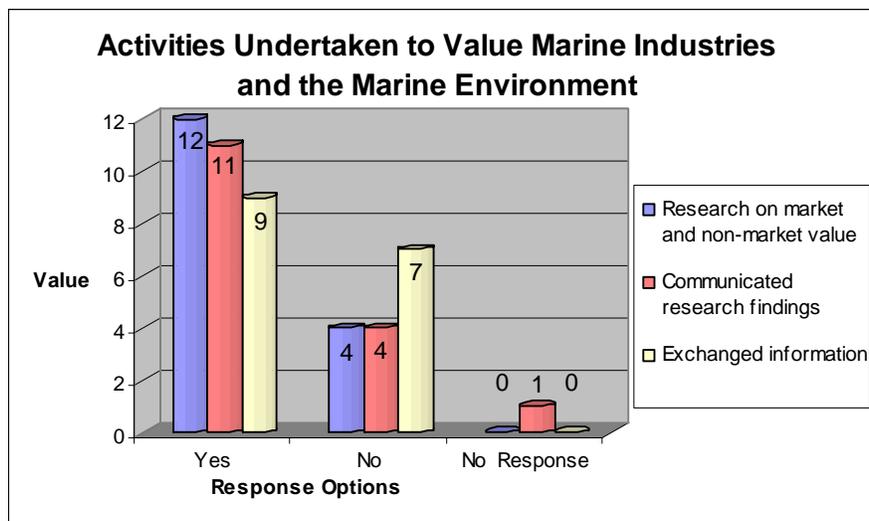


for less developed Economies. However, the survey question did not explore this issue and further research would be needed to test such a hypothesis. Nevertheless, should this prove to be the reason for a lower level of research in this field by developing Economies, an argument might be made for the establishment of a significant enabling fund, from which lesser developed Economies could draw the financial resources necessary for them to play a more equal role in combating the global problem of invasive marine species. In the absence of such a dedicated funding mechanism, initiatives such as GLOBALLAST and other multi-lateral efforts to develop management methodologies will be of considerable importance in building the capacity of developing Economies.

At the BPA Implementation Workshop at Manado in November 2007, participants urged that APEC Member Economies be encouraged to ratify and implement the IMO-BWC. Also, that future efforts to understand, control, and manage invasive marine species consider trade pathways and the effects of climate change on species range and composition.



Question 13	Relates to BPA Action: I.a.x
<p>Since September 2005, has your Economy undertaken any of the following activities, with regard to the value of marine industries and the marine environment?</p> <p>a) Research on market and non-market value;</p> <p>b) Communicated research findings (e.g. seminar/paper);</p> <p>c) Exchanged information.</p>	<p>Study the market and non-market value of the marine environment and marine industries in the Asia-Pacific region, including by undertaking research, communication and information exchange on marine activities.</p>



Interpretation of Quantitative Data

The quantitative data suggests that some Economies see the study of value for the marine environment and marine industries largely as a domestic activity. The results of such research were reported to be shared commonly (e.g. through seminars or published papers) but fewer Economies appear to approach the task through a collaborative process of information exchange. Nevertheless, the high number of positive respondents indicates that Economies accept that the study of market and non-market value of the marine environment and marine industries is a worthwhile activity.

Domestic Initiatives

A developed Economy cited the production of a 'Marine Economy 1997-2002 Report' that measured the contribution of marine-based industries to that Economy. Other efforts reported by this Economy include:

- the development of a methodology and benefits-transfer database to value and rank projects aimed at protecting indigenous biodiversity from exotic pest and disease incursions. This project was said to use economic valuation tools within a cost-benefit framework. The cost-benefit framework includes stated preference approaches, and an assessment of possible benefit transfer to gain an understanding of the changing value placed on biodiversity as a result of pest incursions; the project also included a marine case study.
- Mapping the geographic location of economic, environmental, and social assets, along with cultural values that can help to inform decisions on marine management, including biosecurity.

One emerging Economy reported market research that produces annual data on the value of fisheries from aquaculture and capture fisheries (collected through surveys and licensing),



and non-market value (based on the strength of industry human resources). This Economy has published trade statistics and stated that non-market value data is available through the internet. Another emerging Economy reported the formation of a Fisheries Sector Commission that includes private-sector representatives to study the market and non-market values of the marine sector.

A developed Economy reported "...routine market and production surveys for...[the]...fishing industry, and trade statistics..." and noted that these are disseminated regularly. This Economy also cited collaborative work with universities to monitor the marine environment, but did not specify whether such effort includes any attempt to value the environment.

An Economy cited a range of relevant activities, including: fisheries management cost-benefit analysis; the collection of statistics on the economics and social characteristics of fisheries; research on socio-economic coastal management; and climate sensitivity issues analysis. This Economy also reported that, through such a body of work, it has built expertise in marine and coastal socio-economic research, and that it regularly publishes publicly available statistics on marine, coastal, fisheries, and climate topics.

Another Economy reported that it produces economic research, analysis and advice on a wide range of fisheries and oceans topics. Specifically, the Economy reported that current projects include: economic and market analysis of fisheries pressures, including pressures facing the industry; analysis of benefits and costs of legislative outcomes; bio-economic modelling of commercial fisheries; integration of analysis in fisheries plans; and assessment of pressures and trends affecting fishery-dependant communities. This Economy also reported the development of a database that includes information on fish landings, export and import values, recreational fisheries, aquaculture and the contribution of 'ocean industry' to the Economy. Finally, the Economy noted that it has updated its methodology for measuring the contribution of ocean industry to the Economy (and is applying the new method nationally at present). In 2007, an assessment was said to have been published jointly with another Economy on the market value of the marine sector for a shared ocean area.

Two developing Economies cited seminars or workshops, while one of these Economies also cited comparative studies, the dissemination of information to the public, and research on marine farming and ornamental fish as actions under this question. In addition, the latter Economy noted its collaboration with the Marine Aquarium Council on market valuation initiatives since 2004. The other developing Economy observed that it has undertaken research on the value of the marine sector, primarily with regard to fisheries, minerals and tourism, which was supported by a public hearing on the research outcomes. The public hearings were used to identify public values and objectives, as well as to enhance public awareness on the value of the marine sector. The outcomes of the research and public hearings process informed a 'National Oceans Policy' and associated institutional arrangements. Another developing Economy reported that it has established a National Ocean Strategy through which it aims to identify the value of the ocean and the fisheries sector.

One Economy stated that "socio-economic aspects are considered as part of the ecological development projects in marine and coastal areas where for the participating sectors the state of resources and pressures from each sector" are studied. This Economy observed that "effort has been made to assess the value of industries associated with marine and coastal activities" as a part of a major marine ecosystem project, and that information produced by this assessment is available to the public on the internet. The assessment process was described as participatory in nature, involving social groups, the general public and civil society who sit on committees for each project.

NGO involvement in a project reviewing the role of MPA in poverty reduction was cited as an action by a developed Economy. This Economy reported several efforts to identify values, including an assessment of the value of marine industries and the marine environment. Other efforts included: a project on designing marine reserves for biodiversity and sustainable fisheries; an assessment of the whale watching industry, which will be disseminated for public consultation; and annual studies to determine the tourism value of a large-reef MPA, which is



supplemented by a study that focuses on recreation value as opposed to tourism.

Two Economies did not elaborate when identifying affirmative action in the quantitative responses.

Regional Initiatives

None reported.

Relevant International Initiatives

The developed Economy that indicated research on market analysis of fisheries pressures under a domestic initiative also stated that it sometimes presents research findings at international conferences such as, the European Association of Fisheries Economists Conference. This Economy also shares research with FAO and other organisations that publish World Fisheries and Aquaculture Reports, and exchanges information on aspects of the domestic marine sector through bilateral meetings.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Few organisations indicated that they conduct value studies of the marine environment and/or marine industries. Some of the organisations that replied negatively, amplified their response with an explanation that such research is outside of their mandate. Qualitative data for this question revealed that most of this type of research that is done by organisations is focused on Economies, or done in association with an Economy government.

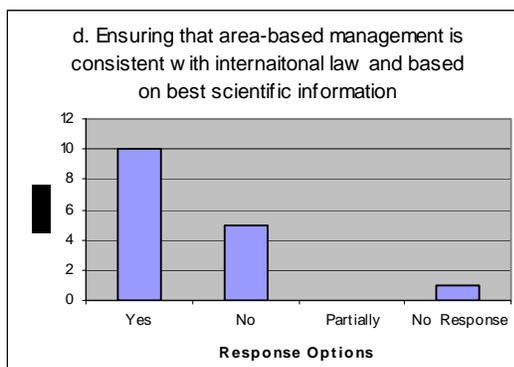
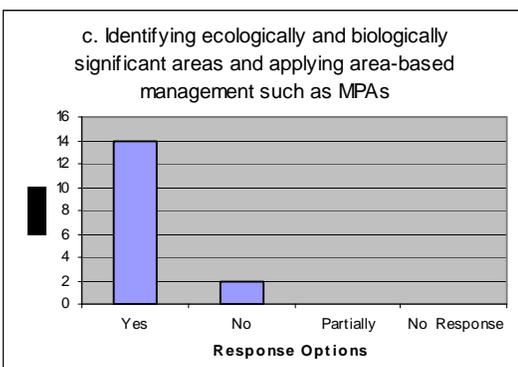
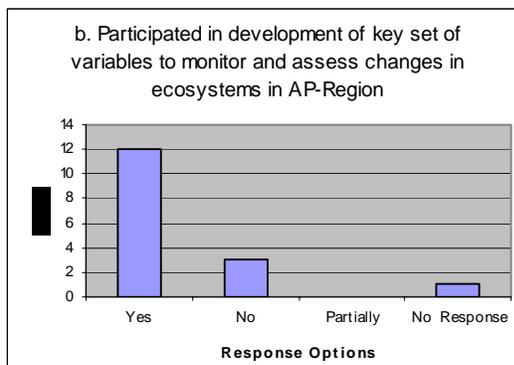
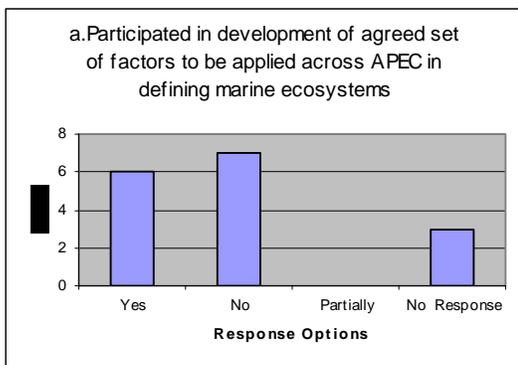
Section Summary

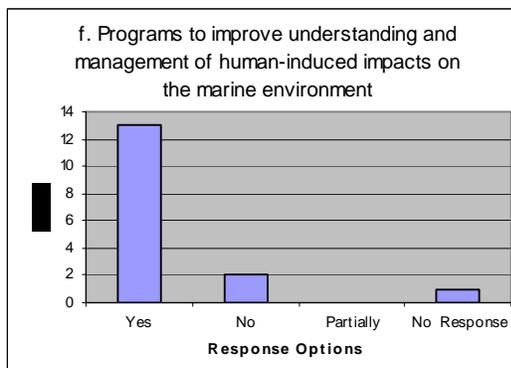
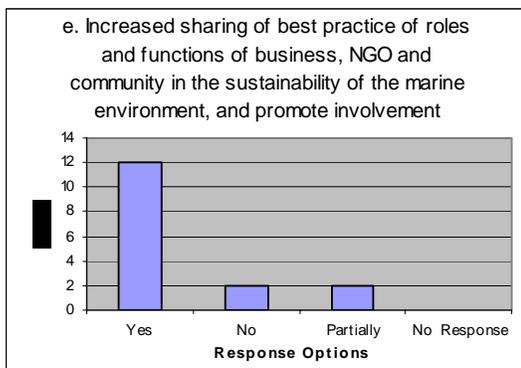
The response to this survey question suggests that a large majority of participating Economies do conduct studies on the market and non-market value of the marine environment and marine industry. There does not appear to be any bias in the number of Economies that conduct research, communicate findings or exchange information arising from the developmental stage of the various Economies. Indeed, in some instances, such research was undertaken by developing Economies in support of advanced management tools such as Oceans Policy and Ocean Strategy initiatives. Several Economies also emphasised the importance of public consultation in this activity both to improve outcomes and to promote awareness of the value of the marine-based economy.



Pillar I.b. Managing the marine environment sustainably

Question 14	Relates to BPA Actions: I.b.i, I.b.ii, I.b.iii, I.b.iv
<p>Please indicate those areas in which your Economy has taken action.</p> <p>a) Participated in the development of an agreed set of factors to be applied across APEC Member Economies in defining ecosystems?</p> <p>b) Participated in the development of a key set of variables (indicators) to monitor and assess changes in Asia-Pacific region ecosystems?</p> <p>c) Identifying ecologically and biologically significant areas and applying area-based management measures such as MPA?</p> <p>d) Ensuring that area-based management initiatives are consistent with international law and based on best available scientific information?</p> <p>e) Increased sharing of best practice of the roles and functions of business, NGO and community in the sustainability of the marine environment, and promote their involvement?</p> <p>f) Programs to improve understanding and management of human-induced impacts on the marine environment?</p>	<p>i: Develop an agreed set of factors to be applied in defining marine ecosystems in the Asia-Pacific region, and establish a key set of variables to monitor and to assess changes in these ecosystems;</p> <p>ii: Initiate the identification of ecologically and biologically significant areas and apply, as appropriate, area-based measures, such as marine protected areas, consistent with international law and based on best available scientific information, to manage and conserve these areas;</p> <p>iii: Increase sharing of best practices on the roles and function of the business and private sectors and communities in the sustainability of marine environment, and promote their involvement;</p> <p>iv: Improve understanding and management of the impacts of human activities, including fishing practices and aquaculture, on environmental health and productivity.</p>





Interpretation of Quantitative Data

a) Only six Economies indicated that they have participated in the development of an agreed set of factors to be applied in defining marine ecosystems in the Asia-Pacific Region. Against this, a further seven Economies noted that they had not participated in any such initiative. The 'No Response' return was also highest for this part of Survey Question 14. Therefore, the evidence is far from clear on whether there is any real momentum to develop such an agreed set of factors within the Asia-Pacific Region. The qualitative data also does little to clarify understanding of the situation with regard to this initiative.

b) A total of 75% of respondent Economies indicated that they have participated in efforts to develop a key set of variables to monitor and assess changes in marine ecosystems in the Asia-Pacific Region. However, only two workshop-based activities were cited in the examples offered in elaboration by the Economies.

c) The identification of EBSA and establishment of area-based management measures for their protection is the activity that received the strongest level of support in this survey question. All but two of the respondent Economies claim to have been active in this regard.

d) In the context of the extensive efforts to identify EBSA and apply area-based management measures (ABMM) for their protection, outlined in Part C of this survey question, the most remarkable aspect of the response in Part D is that five Economies declared that they do not ensure that ABMM are consistent with international law or based on best available science.

e) Twelve of the 16 responding Economies reported that they have increased the extent to which they share information on the best practice of business, NGOs and the community with regard to sustainability of the marine environment, and promote their involvement. A further two Economies indicated a partial increase in such sharing of information and participation, and only two Economies reported no improvement in this aspect of marine management.

f) A convincing majority of respondent Economies stated that they have undertaken programs to improve understanding and management of the impacts of human activities. The qualitative data offers examples of such programs.

Domestic Initiatives

a) *Participated in development of an agreed set of factors applied across APEC in defining marine ecosystems.*

In its elaboration for this question, a developing Economy reported that it "develop[ed] training manuals on the Code of Conduct for Responsible Fisheries [and] conduct[ed] training for local government units". How this relates to developing an agreed set of factors to be applied in defining marine ecosystems is not explained. Another developing Economy reported participation in APEC meetings on marine resource conservation and fisheries (i.e. Chile, 2005; Bali, 2005), and two Economies cited participation in the APEC Major Marine Ecosystem Mapping Project in Qingdao, China in 2007.



Integrated management of the marine environment at the national and regional level was reported by one emerging Economy, where this Economy and a neighbouring Economy have developed the initial phase of a LME project with support from GEF and UNDP. In support of this project, an international conference with 400 scientists from 21 countries was reported to have been organised with the assistance of a French research institute. This conference was said to have focused on promoting a paradigm shift away from operational fisheries management to an ecosystem approach. An updated project proposal was due to be sent to the GEF Secretariat in early 2008.

Three Economies did not answer or provide elaboration for this question and one Economy indicated that the question is not applicable to it.

b) Development of a key set of variables to monitor changes in ecosystems in the Asia-Pacific Region.

An emerging Economy reported that it currently has a relevant project underway, with assistance from a research institute in another Economy, that seeks to understand the functioning and structure of the local marine ecosystem to improve real-time fisheries management under an ecosystem approach. Participation in the formulation of EIA procedures was also cited by a developing Economy as an initiative to develop variables to monitor and assess ecosystem changes.

A developed Economy reported that it has a "...marine bioregional planning process..." and that, through this, it is "...developing comprehensive marine regional profiles" to bring together knowledge about conservation values, uses and threats. In addition to this project, the Economy reported that it has a "...pilot project to develop ecosystem health indicators" for marine waters. The outcomes of the pilot project will be applied to marine bioregional plan profiles to help eliminate the uncertainty associated with traditional descriptions of indicators. The Economy commented that such an approach is consistent with modern indicator analysis for fisheries and marine ecosystems.

One Economy cited its participation at a meeting in Qingdao, China in 2007 as a relevant activity. Another Economy reported that it participated in APEC's Survey on Comprehensive Ocean Management in 2005, before the Oceans Ministerial Meeting at Bali, Indonesia. An emerging Economy stated that it "...takes into account the indicators of productivity over-fishing adopted by the World Economic Forum to evaluate and monitor change[s] [in] ecosystem[s]".

c) Identified EBSAs and applying area-based management

The designation of MPA and Wetland Protected Areas (WPA) was reported by one Economy for areas that show high biodiversity and conservation value. In support of these designations, this Economy reported that it introduces community participation through education on the value of mudflats, eco-tourism guides, development of best practice for mudflat eco-tourism and monitoring by local residents. An Economy indicated that it has established a number of MPAs through legislation.

An emerging Economy reported that it has 25 MPA that cover an area of 4,795 hectares under the authority of one agency. In addition, several ecologically or biologically significant areas were said to be protected as marine parks or reserves under another agency in that Economy. Another emerging Economy reported the establishment of one marine reserve and four marine parks, and noted that it is establishing two fisheries protection areas covering 10% of its waters. Progress cited by another developing Economy was reported to include establishment of a marine ecological development program (MEDP) for one large marine area that includes several MPAs. These efforts were said to have been supported through workshops with international experts, including one held in 2007 that focused on marine biodiversity and biogeography both within and outside of the EEZ.

A developed Economy highlighted its commitment to establishing a network of representative MPAs that will contribute to the long-term ecological viability of marine and estuary systems. In addition to MPA, this Economy reported the implementation of fisheries closures for biologically significant areas. Further supporting activities were reported to include bioregional



assessments, subsequent implementation of six marine parks and nine inter-tidal protected areas (IPA), and in other areas, the establishment of complete no-take zones. Finally, this Economy noted that in one region, regional marine plans are being implemented for marine parks.

The activities of another developed Economy were reported to include a continuous effort to identify MPAs and fisheries-based management areas. Cited examples include: a Marine National Monument where effort to have an area designated as a particularly sensitive area (see UNCLOS Article 211) through the IMO are in train; a National Estuarine Research Reserve; and contribution to the international development of guidelines (e.g. World Heritage). Another developed Economy reported having identified EBSA within each of their Large Offshore Marine Areas (LOMAs) and "...are applying these to the designation of future Marine Protected Areas (MPA)". As of March 2007, this Economy had six MPAs. It further reported (in addition to international initiatives) that the "most common fisheries management measures used to protect sensitive areas and species are temporal or area closures and gear restrictions". Other restrictions listed included: depth, limits on incidental catch, requirements to report lost gear, recovery plans, MPA, and creative incentive programs (e.g. requiring fishers to direct all proceeds from the sale of certain sensitive species for research and specific management purposes). Additionally, this Economy stated that it is developing a "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas".

Another Economy observed that, its MPA network is based upon a 'Marine Protected Areas Policy and Implementation Plan', and that currently over 1.2 million square kilometres is closed to bottom-fishing methods. Other outcomes listed include the establishment of marine reserves and parks, and areas where only customary fishing is allowed.

One Economy indicated that, with the assistance of another Economy, implementation of a coral reef rehabilitation program has resulted in the identification of EBSAs, some of which were noted already to be within MPAs. The reported diversity of ecosystems within another Economy's jurisdiction was said to have resulted in the establishment of MPAs that cover 15% of that Economy's maritime territory, under a "System of Natural Protected Areas". An emerging Economy reported that it has also identified areas of biodiversity significance, along with the identification of any development that potentially could affect these areas. Yet another Economy also reported that about 40 island-based MPAs have been gazetted.

d) Ensured area-based management is consistent with international law and best science

For this part of Question 12, rather than offer evidence, certain Economies chose to make statements asserting best science and international legal compliance. For example, one Economy stated that "area-based management initiatives are based on the results of research/best available scientific information, and consistent with international law". A developing Economy asserted that its area-based management is achieved "through internationally accepted rules...". Three other Economies reported that their area-based management or policies take into account international law and best scientific information, with one also citing international guidelines. An Economy further stated that its LOMAs are supported by extensive scientific knowledge "...through an Ecosystem Overview and Assessment Report", and that the identification of EBSAs is based upon "...three primary criteria, uniqueness, aggregation and fitness consequences..." and two secondary pillars, resilience and naturalness. This Economy also noted that it is undertaking "GIS mapping studies of marine ecosystems and is conducting assessments of biological and chemical-physical interactions". Whereas another Economy reported more generally that all MPAs are within their "...jurisdiction..." and that these are established in accordance with "...national environmental legislation..." and that the Marine Ecological Development Plan (MEDP) was developed with broad social and sectoral participation, "...using best scientific information available".

One developing Economy cited its creation of training manuals based on the FAO Code of Conduct for Responsible Fishing, and conduct of training for local government, as evidence in support of scientific and legal under-pinning for MPA establishment.



A developed Economy stated that scientific information from "...baseline surveys [and] technical reviews" are "...subject to socio-economic impact evaluation", and that these guide the development of management initiatives, where "...marine parks and reserves are managed through [a] zoning system..." that is "reviewed regularly and amended as necessary based on updated ecological information".

An Economy reported that area-based management complies with the FAO Code of Conduct for Responsible Fishing and the UNCLOS. Whilst another Economy also reported compliance with the UNCLOS, and stated that MPAs are managed using best available information as required by national guidelines, and that "...fisheries closures are consistent with international law and based upon best available scientific information".

e) Shared best practice on the roles of business and public in sustainable marine management

A developed Economy reported the presence in that country of more than 10 NGOs participating in marine resource management/ecology initiatives with community. Another Economy noted the contribution of MPA Boards and Outreach Committees, and Fisheries Management Councils. A developing Economy noted that they receive a range of assistance from NGOs to set "...best practice [and] application of sustainable marine conservation policy...". Another Economy cited a range of initiatives to promote community participation in marine resource management, for example: public consultation involving NGOs, community and stakeholders to develop environmental policy; a Marine Park Visitor Liaison Group that meets regularly to express views and make recommendations; a Marine Park Ambassador Program to promote public involvement, i.e. students and volunteers are trained to assist in promoting marine parks and conservation; and the provision of funds for environmental projects.

A slightly different approach was reported by another Economy, which stated that public participation is important at every level, from overarching policy down to development consents by local government. Such public participation in resource management was said generally to be mandatory. Another developed Economy reported that, for the fisheries sector, the "management approach and legislative backdrop" require stakeholder engagement, which includes NGO involvement.

Partial progress was reported by one developed Economy through new governance mechanisms established for each of the five established LOMAs, where sharing of best practice is said to have been achieved. In addition to these efforts, this Economy stated that it will be "...holding a workshop jointly with NGOs and the international community on MPAs".

Another Economy reported that it had adopted a planned approach for outside participation in marine conservation "...with society and producers over a two-year period" where a "...multi-criteria multi-approach was used to ensure objectivity and achieve consensus...". While another Economy stated that the focus for external involvement in marine management is upon fisheries management initiatives. Another reported that it used the tool of "seminars and workshops" to maximise public participation.

A developing Economy reported "...encourag[ing] participation of all stakeholders and promotes to share best practice on a case-by-case basis". The sharing of "...best practice and knowledge management" through community networks was also reported to be under development by an Economy. One final mechanism reported by an emerging Economy was that "environmental inspections in different aquaculture sectors [are done] with the participation of entrepreneurs".

Once again, one Economy expressed the opinion that the question was not relevant to it.

f) Programs to improve understanding and management of human impacts on marine environment

A developed Economy reported that its National Program of Action for the Protection of the Marine Environment from Land-based Activities (NPA) provides a framework to set priorities and coordinate government efforts to reduce coastal/marine degradation caused by land-



based activities. The Economy stated that the NPA encourages collaborative approaches among terrestrial and marine sectors to raise awareness and understanding of the issues related to impacts. This Economy is also a Party to the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* 1972 and its 1996 Protocol, and thus noted that it participates in the development of international guidance on: the assessment of alternatives and pollution prevention; the assessment of waste and methods to minimise impacts; and monitoring.

An Economy reported recent development of a Regional Action Program to Prevent Marine Pollution from Land-based Sources, and that a coordinated government and public-sector approach is being taken to study interactions of human activities and the effects of pollution on the marine environment. Another Economy reported implementation of two monitoring programs to address the issue of biological effects of pollution on marine waters, and to identify pollution sources. Additionally, this Economy stated that it is developing a joint 'River Delta Water Quality Model' to enhance the understanding of water pollution in shared waters, and reviewing another joint project on 'Water Pollution Control' to devise pollution control measures. In relation to coral reefs, biological information was also collected by this Economy and the results were publicly announced to raise public awareness of the status of the marine environment and to seek cooperation. Finally, this Economy reported that a 'Marine Park Visitor Liaison Group' meets regularly to allow stakeholders to express views and make suggestions on marine conservation.

Another developed Economy cited a range of relevant efforts, including integrated coastal management planning, community resilience to coastal hazards, and a National Program of Action on Land-based Pollution.

An Economy reported that improved understanding of human-induced impacts was achieved through a "...coordinated multi-agency evaluation process to evaluate proposed development projects that have potential impact on the marine environment". This Economy also highlighted that "...Monitoring and Management Plans..." are implemented during and after any development project to "...ensure that anticipated impacts are not exceeded".

To understand fisheries impacts better, one Economy reported that it uses 'Ecological Risk Assessment' and 'Ecological Risk Management' as a formal process and tool to improve the understanding of impacts. Additionally, this Economy reported research programs on:

- fisheries technology, to develop and test fishing gear, develop by-catch reduction devices, and assess recreational fish hook mortality etc;
- fisheries biology, to investigate life history characteristics, perform population modelling, provide advice to fisheries managers;
- freshwater biodiversity and habitats, monitor riverine systems, understand distribution and abundance, test genetic population structure, assess impacts of pest species and control techniques etc;
- marine biodiversity and habitats, monitor estuarine conditions, evaluate floodgates and other barriers, map habitats, and understand species distribution etc; and
- ecosystem functioning, including quantitative assessments of functions and connectivity between systems, and to assess ecosystem-based management and modelling within the estuaries of other Economies.

Additionally, this Economy reported research on how to improve understanding of the impacts of proposed coastal developments, which is being assessed through an Ecologically Sustainable Development framework, in the context of limited fish resources, a growing human footprint and population, increasing coastal development and infrastructure, and rapidly advancing technology.

Another Economy observed that "Stakeholder consultation [and] dissemination of information on new fisheries management [initiatives]" is an initiative it takes to help improve understanding of human-induced impacts on the marine environment. Other relevant initiatives cited by the respondent Economies include: "seminars on waste water management from aquaculture"; general information dissemination; training and workshops on coastal and small island management; publishing a series of books for students and the general public;



and actions in fisheries management, such as large-scale vessels being required to install vessel monitoring system (VMS) devices to enable improved monitoring of fishing activities.

An emerging Economy reported that it is working jointly with NGOs and research institutions to establish programs along the coast to identify polluted areas, and that as a result of current effort, two projects have been established. One of these projects was said to focus on water quality and the other on monitoring the dumping of sewage. The promotion of good fishing practices that avoid sea turtle and bird by-catch among artisan fishers was also reported by this Economy, along with a workshop on aquaculture and fish processors that was said to focus on building environmental awareness.

Regional Initiatives

a) Participated in development of an agreed set of factors applied across APEC in defining marine ecosystems.

One developed Economy that participated in a workshop with 10 other Economies for this topic stated that the workshop "...successfully identified four general factors to define marine ecosystems in the APEC region – bathymetry, hydrography, primary productivity, and trop[h]ic linkages – and provided examples of how these were being used in their marine ecosystems".

b) Development of a key set of variables to monitor changes in ecosystems in the Asia-Pacific Region.

One emerging Economy reported actions "through specific regional projects". No further elaboration was given. Another emerging Economy noted that the "ASEAN Marine Water Quality Criteria have established a set of key parameters to monitor, although it should be noted that these Criteria are not standards nor targets for these parameters". A developed Economy highlighted their participation in a workshop "on this endeavour in which 10 Economies participated. Economies considered five indicators – productivity, fish and fisheries, pollution and ecosystem health, socio-economics, and governance – for use in the APEC region". Another regional initiative noted by an emerging Economy was a working group (WP7) meeting that focused on biological indicators.

Two developed Economies declared that they are a member of PICES, whose activities include monitoring changes in ecosystems in the North Pacific. Another developed Economy stated that it participates in ecosystem monitoring in the Pacific Ocean through a number of mechanisms and that the Economy is a member of the IOC. This Economy reported that the "IOC has identified several key scientific issues central to understanding marine ecosystems and their living resources, and has developed corresponding programs", including: benthic ecosystems; the harmful algal bloom program; coral bleaching; LME program; ecosystem indicators for fisheries; ecosystem dynamics; and coastal nutrient enrichment. Additionally, this Economy reported that it is a party to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 and its 1996 Protocol and, as such, conducts and reports on disposal site monitoring, which includes sites in the Pacific. Finally the Economy reported that, through a regional scientific review committee, Ocean Status Reports are prepared on an annual basis. Semi-regular monitoring of physical and biological oceanographic conditions and fishery resources is also undertaken to understand the natural variability of ecosystems and how they respond to natural and anthropogenic stresses.

c) Identified EBSAs and applying area-based management

None reported.

d) Ensured area-based management is consistent with international law and best science

None reported.

e) Shared best practice on the roles of business and public in sustainable marine management

None reported.

f) Programs to improve understanding and management of human impacts on the marine environment



A developed Economy stated that an 'Ecosystem Modelling Project' is being undertaken by a research agency in the estuarine ecosystem, of another Economy. The project is said to include research on economic, social and human-induced impacts.

Relevant International Initiatives

a) *Participated in development of an agreed set of factors applied across APEC in defining marine ecosystems.*

None reported.

b) *Development of a key set of variables to monitor changes in ecosystems in the Asia-Pacific Region.*

One emerging Economy stated that it is involved in an aquatic ecosystem and fisheries focused project with the objective of identifying strategies for restoring ecosystems and fisheries according to the goals of the Johannesburg World Summit on Sustainable Development.

c) *Identified EBSAs and applying area-based management*

An international Marine Ecological Expert's Workshop was reported to have been sponsored by one Economy during 2005. The stated purpose of the Workshop was to assist in the development of criteria for EBSAs to guide efforts internationally. The Economy reported that it has held several side-events to this action at various international meetings to disseminate workshop results (including one held at the Conference of Parties to the Convention on Biological Diversity).

d) *Ensured area-based management is consistent with international law and best science*

None reported.

e) *Shared best practice on the roles of business and public in sustainable marine management*

In addition to domestic efforts, a developed Economy reported that it exchanges best practice with other APEC Economies on mechanisms to include community, NGO and business in marine resource management programs. Another Economy stated that it hosted an international conference on 'Protected Areas' in 2005 to share and promote expertise in managing protected areas, and that it also hosted an Asia Pacific Coral Reef Symposium to promote marine conservation.

f) *Programs to improve understanding and management of human impacts on the marine environment*

None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

The Organisation Survey revealed that organisations are primarily active in the identification of EBSA and application of area-based management measures, along with improving understanding and management of human impacts on environmental health and productivity. Interestingly, these non-State actors cited programs and activities that take place mostly at the regional and international level, whereas the activities discussed by Member Economies are primarily domestic initiatives. The very low participation rate by organisations (two only) in development of an agreed set of factors to be applied in defining marine ecosystems in the Asia-Pacific Region is consistent with the majority of Economies that also either indicated no involvement or did not respond to the question.

Section Summary

a) Although six Economies indicated that they have participated in efforts to develop an agreed set of factors to be applied in defining marine ecosystems in the Asia-Pacific region, only one Economy actually cited a relevant example in its amplification text. The initiative cited by that Economy was a workshop that identified four "general factors to define ecosystems", they are: bathymetry, hydrography, primary productivity and trophic linkages.



The workshop was said to have been attended by 10 Economies; however, no evidence was offered to suggest that these four factors for defining marine ecosystems have been agreed outside of that workshop forum.

b) The Workshop referred to in the paragraph above was cited again with reference to the development of a key set of variables to monitor and assess changes in Asia-Pacific ecosystems. The following five indicators were said to have been considered: productivity, fish and fisheries, pollution and ecosystem health, socio-economics, and governance. A total of 75% of respondent Economies indicated that they have been active in the endeavour to develop such a key set of variables. However, although qualitative data provided in support of the survey response demonstrates a broad range of activities associated with the development of ecosystem indicators, there is only the one workshop cited as a regional activity to establish a key set of variables. No evidence is offered on the extent to which the outcomes of this workshop have been taken up by APEC Economies.

c) All reported efforts to identify ecologically and biologically significant areas (EBSA) took place at the domestic level. Only two respondent Economies indicated no action in this regard. The remainder cited a rich array of programs and initiatives that included: the creation of thousands of hectares of MPA; the protection of island areas as MPA; the creation of fisheries protected areas and no-take zones; the establishment of an inter-tidal protected area; bioregional assessments; the creation of a marine national monument and a national estuarine research reserve; the development of MPA policies and plans; and more. At the international level, an Economy noted its support of a Marine Ecological Experts Workshop in 2005 that developed criteria for EBSA, along with subsequent related side-events at other international meetings.

d) The quantitative responses to this survey question reveal that 14 out of a total of 16 participating Economies have identified EBSA and established area-based management measures to protect them. However, five of the 16 Economies declared that their area-based management initiatives are either not based on best available science or are not consistent with international law (the structure of the question does not discriminate between the two criteria). Qualitative data for this question may reinforce a conclusion that the scientific/legal foundation for some area-based initiatives may not be strong. Although several Economies offered examples of measures taken to collect and examine scientific data, many refrained from offering evidence and simply made statements to the effect that best science and the international legal framework are respected.

e) A significant majority of the surveyed Economies indicated that they have increased sharing of best practices on the roles and function of the business and private sectors, and communities in sustainability of the marine environment, and promoted the involvement of these sectors. The mechanisms used to achieve this outcome include *inter-alia*: liaison with NGOs; the establishment of consultative committees and councils; the funding of community projects; and the involvement of entrepreneurs in environmental inspections.

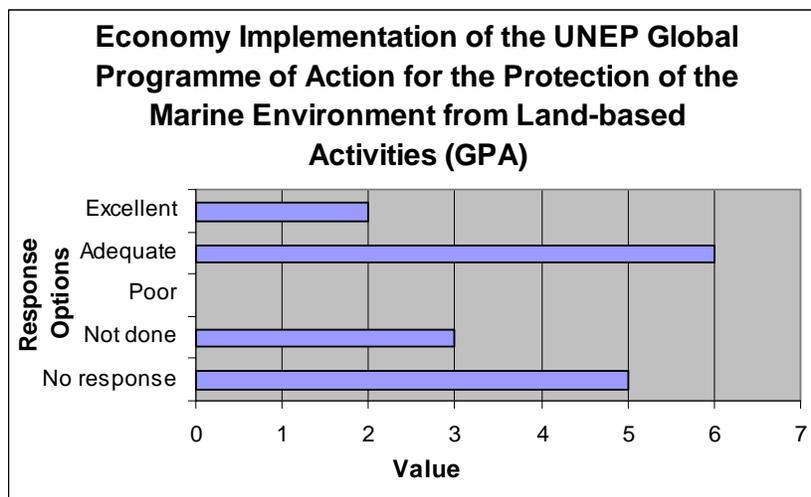
f) Only two Economies reported that they have not taken any actions to improve understanding and management of the impacts that humans have on the coastal and ocean environment. Such a positive response is consistent with a broad range of relevant activities that was offered as elaborative comment. Almost all of the cited initiatives are done by Economies at the domestic level.

Workshop

At the BPA Implementation Workshop at Manado in November 2007, participants stressed the importance of sharing lessons learnt within and outside the region with respect to: managing large open spaces; identifying and managing significant areas; and efforts to manage areas beyond national jurisdiction. They identified a further need to educate and raise awareness of both decision-makers and committees on the social and economic values of conservation tools such as marine protected areas, with attention also given to the role of industry and the private sector.



Question 15	Relates to BPA Action: I.b.v
Since September 2005, how would you rate the success of your Economy in implementing the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities?	Encourage relevant Economies to reduce land-based sources of marine pollution, both domestically and regionally, by implementing the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), and supporting its advancement through participation in the 2 nd Intergovernmental Review of the GPA in China in 2006.



Interpretation of Quantitative Data

Half of the respondent Economies indicated that their performance in implementation of the UNEP-GPA since September 2005 is 'adequate' or 'excellent'. Other Economies either declined to answer the question or admitted that they have not implemented the GPA.

Domestic Initiatives

One developed Economy reported that it has established a National Program of Action for the Protection of the Marine Environment from Land-based Activities to address issues on a regional and national level. The Program is said to be based on the principles of sustainable development, integrated management and the precautionary approach. The Economy noted that this Program is kept under review.

Another Economy observed that its decision not to participate in the UNEP-GPA program does not hamper it from controlling land-based sources of marine pollution. The pollution control program of that Economy was reported to include: environmental planning control, trade effluent and wastewater treatment prior to disposal, proper oil containment and chemical storage, as well as monitoring of hazardous chemicals transport to avoid spillage.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

**Discussion of Organisational Perspectives (from the Survey of Organisations)**

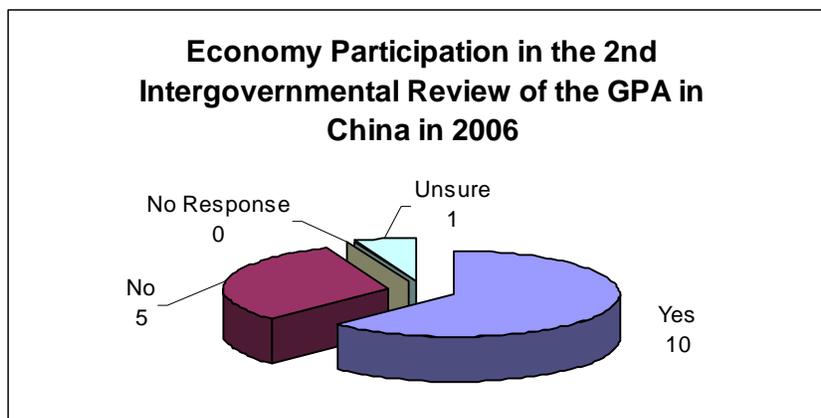
More than 70% of organisations that responded to the BPA Organisation Survey declined to comment on whether land-based sources of marine pollution have remained the same, increased or decreased in their geographic areas of interest since 2005. Of the organisations that did respond, the comments suggest a mixed performance with conditions improving in some locations and deteriorating elsewhere.

Section Summary

The result reported by APEC Economies in this survey on implementation of the UNEP-GPA appears to reflect a perception that although land-based sources of marine pollution is a problem with regional and even global consequence, its cause is essentially a matter that occurs on land over which Economies have full sovereignty. Thus, the imperative is weak to act on multi-lateral programs to address problems/sources that are likely to be seen mainly as local (hence, 50% of Economies either declined to answer the question or replied in the negative). This perception is a problem that appears to have beset multi-lateral initiatives to address land-based sources of marine pollution around the world (e.g. an early land-based marine pollution instrument was done in 1980 for the Mediterranean only after three years of “difficult and delicate” negotiations).



Question 16	Relates to BPA Action: I.b.v
Did your Economy participate in the 2 nd Intergovernmental Review of the GPA held in China in 2006?	Encourage relevant Economies to reduce land-based sources of marine pollution, both domestically and regionally, by implementing the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), and supporting its advancement through participation in the 2 nd Intergovernmental Review of the GPA in China in 2006.



Interpretation of Quantitative Data

The Second Intergovernmental Review Meeting (IGR-2) of the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA) was held in Beijing, China, on 16-20 October 2006. A total of 62.5% of respondent Economies confirmed attendance at IGR-2.

Domestic Initiatives

None reported.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Nearly 80% of respondent organisations declined to answer the question on the effects of land-based activities on the marine environment, and no indication was given of participation at UNEP-GPA IGR-2.

Section Summary

The first Intergovernmental Review Meeting (IGR-2) for the UNEP-GPA took place in Montreal, Canada in 2001. The IGR meetings are a forum where Governments and other Stakeholders meet to review the status of the implementation of the GPA and decide on action to be taken to strengthen implementation of the GPA. The IGR-2 took place in conjunction with The Global Forum on Oceans, Coasts and Islands, which partnered with the

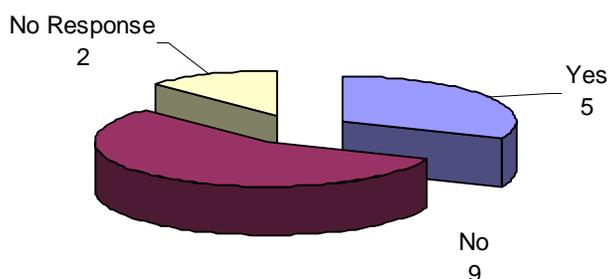


GPA to produce a global review of status and trends on freshwater/coastal/ocean issues, including detailed case studies. The event was supported with attendance by many Ministerial representatives from around the world. Therefore, an attendance rate at IGR-2 by the respondent APEC Economies of 62.5% is at a level to be expected.



Question 17	Relates to BPA Action: I.b.vi
Has your Economy undertaken any cooperative studies with the UNEP GPA to determine economic drivers that contribute to land-based marine pollution?	Study, in cooperation with UNEP GPA, the economic drivers that contribute to land-based sources of marine pollution.

Economy Cooperative Studies Undertaken with UNEP GPA to Determine Economic Drivers of Land-based Marine Pollution



Interpretation of Quantitative Data

Most Economies reported that they have not undertaken any cooperative studies with UNEP-GPA to determine economic drivers that contribute to land-based sources of marine pollution. Also, although five Economies indicated that they have participated in such studies, not all of the examples offered in elaborating text can be seen to have examined the subject question of *economic drivers* for land-based sources of marine pollution.

Domestic Initiatives

A 'Resource Management Act' was cited by a developed Economy as its primary initiative to address the effects of land-based activities on the marine environment. Another Economy noted its plan of action to reduce land-based sources of marine pollution.

Regional Initiatives

A developing Economy said that it is collaborating with UNEP-GPA and NOAA to draft a regional action program to prevent land-based marine pollution. APEC funded a collaborative study between two Economies on the economic impacts of marine debris.

Relevant International Initiatives

A developing Economy highlighted a UNEP-funded pilot project to mitigate land-based industrial discharges in that Economy. "The project included the development of an ecological demarcation, the biodiversity study, the social and economic diagnosis and the inventory of land-based sources of pollution." Also, a developed Economy reported that it coordinated with UNEP-GPA to implement the GPA in the Wider Caribbean. Although this initiative was based outside of the Pacific, it developed knowledge and benchmark standards of use to the Asia-Pacific Region. For example, the project entailed the drafting of a Rapid Watershed Assessment and technical support in the development of a National Program of Action on behalf of the Wider Caribbean Nations. Another Economy noted that it is part of the Steering Committee for two UNEP projects, one investigating instruments to address marine litter, and the other on the benefits and costs of controlling marine debris.

**Discussion of Organisational Perspectives (from the Survey of Organisations)**

The conduct of studies in cooperation with UNEP-GPA to examine the economic drivers that contribute to land-based sources of marine pollution appears to be a low priority or limited area of activity for respondent organisations, with only two organisations indicating that they have done such research. Overwhelmingly, 71% (10 respondents) reported no action in this field, and a further two organisations declined to answer the question.

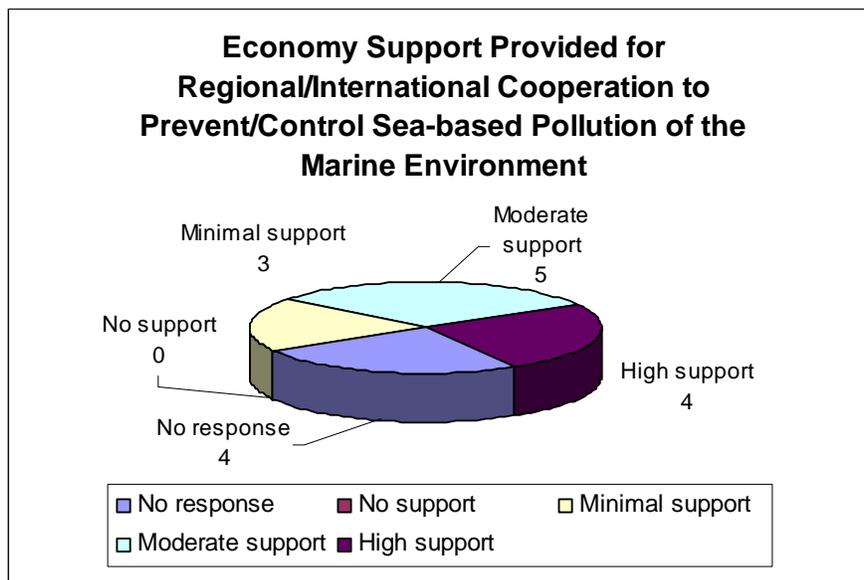
Section Summary

At the BPA Implementation Workshop at Manado in November 2007, participants observed that domestic efforts to address land-based sources of pollution, particularly the problem of sewage, continued to be challenged by weaknesses in regulations, problems in jurisdiction, inadequate enforcement, lack of financial capacity, and a lack of understanding on how to use appropriate technology. Several measures were proposed to address these inadequacies, such as focusing on technology transfer, improvement of regulatory frameworks, encouraging investment through the private sector, and development of common criteria to facilitate implementation (e.g. water quality discharge standards for aquaculture).

However, each of the proposed initiatives would require investment. Therefore, if correct cost/benefit considerations are to be applied to the question of whether to make that investment, the economic drivers behind the phenomenon of land-based sources of marine pollution must be known. Nevertheless, the relatively low participation rate by Economies, and very low participation rate by organisations, in cooperative studies with UNEP-GPA suggest that the importance of such studies may not yet be understood. There would appear to be a requirement for education and awareness building in this regard for APEC Member Economies.



Question 18	Relates to BPA Action: I.b.vii
Please rate the level of support (financial or other) provided by your Economy for regional and international cooperation to prevent and control sea-based pollution of the marine environment.	Support international and regional cooperation, consistent with international obligations, on the prevention and control of sea-based pollution of the marine environment from various sources including oil spills and discharges from vessels.



Interpretation of Quantitative Data

More than half of the respondent Economies rated the level of their support for regional and international cooperation to prevent and control sea-based pollution of the marine environment as 'moderate' or better, with 25% of Economies rating the level of their support as 'high'. However, three Economies rated their support as 'minimal'.

Domestic Initiatives

None reported.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

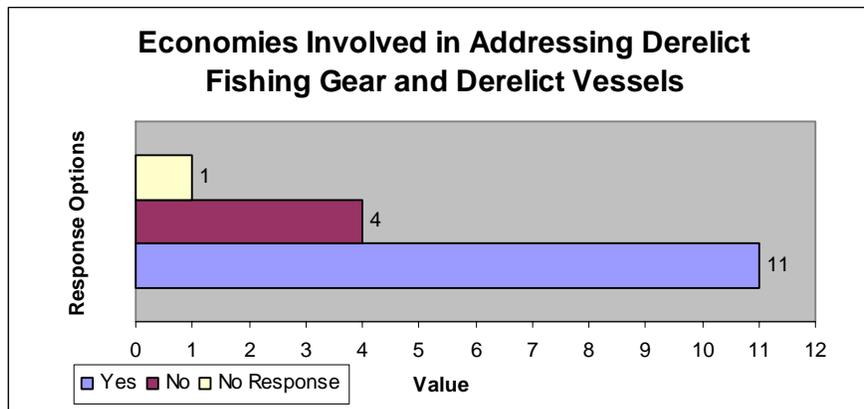
The surveyed organisations reported moderate levels of activity in this area by IGOs and RFMOs but very little by non-State actors. Two exceptions were a research institution that noted its provision of training and advice to ship owners through a specialist department, and a NGO that highlighted its use of children's artwork to support initiatives to reduce sea-based pollution. One IGO and two RFMOs reported relevant activities, including training, related to: law and enforcement, policy development; operational issues; port-State control; advice to owners and operators; publications and strategies for different forms of pollution including that associated with lost or abandoned gear.

**Section Summary**

No elaboration was given by any Economy for this question. However, participants at the BPA Implementation Workshop at Manado in November 2007, highlighted the continuing problem of marine debris, one source of which is vessels. The contributing factors were identified as a lack of government incentives, political will and capacity. A particularly intractable aspect of the problem of sea-based pollution is that an important source is discharge from vessels, which are mobile entities that often cross from one jurisdiction to another in a matter of hours. Also, harmful discharge can occur in locations at sea where it is difficult to monitor the behaviour of vessels. Hence, the strategies reported to have been adopted by non-State organisations would appear to be valid, i.e. training, awareness building, port-State controls, etc. No single Economy can address this transboundary problem in isolation and the importance of a multi-lateral approach would appear to be self-evident.



Question 19	Relates to BPA Action: I.b.viii
Is your Economy actively involved in actions to address derelict fishing gear and derelict fishing vessels?	Support efforts to address derelict fishing gear and derelict vessels, including the implementation of recommendations from research already undertaken in the APEC context.



Interpretation of Quantitative Data

Twenty five per cent of Economies reported that they are not actively involved in actions to address derelict fishing gear and derelict fishing vessels. Comments in elaboration for this question did not explain why they are not so, but from qualitative data provided in support of other questions, such an outcome might be explained by the small size and artisanal nature of the fishing industry in these Economies, and / or their lesser developed status. However, almost all other Economies reported that they are actively involved, with only one Economy declining to respond to the question.

Domestic Initiatives

A developed Economy reported that it supports community based clean-up and information gathering initiatives to address derelict fishing gear. The recreational and commercial fishing industries of this Economy were said also to be actively involved in developing guidelines to prevent derelict fishing gear.

Another Economy noted its use of vessel monitoring technologies to geo-position ships, and an inspection regime, which it utilises to monitor and supervise fishing activities and manage marine resources. However, the Economy noted that its capacity is limited, and because the majority of unregistered vessels are small coastal boats, it encounters difficulties in conducting inspections.

One Economy reported that it has started a national field survey among fishers on the impacts of derelict fishing gear, and is compiling a report on artisanal fisheries and ghost fishing. An Economy stated that its regulations require license holders to remove fishing gear upon termination of their license. Additionally, the Fisheries Agency of another Economy was reported to have allocated USD 3.75 million equivalent annually to repurchase derelict fishing gear and vessels, and to educate fishermen on the importance of addressing derelict gear and vessels.

An Environment Maintenance Boat is reportedly used by an Economy to gather sea-surface debris, including derelict fishing gear and vessels, to ensure safe navigation and to protect the marine environment. Another economy highlighted diving and beach cleaning campaigns to collect marine debris, including derelict fishing gear.



Regional Initiatives

None reported.

Relevant International Initiatives

A developed Economy reported that it is contributing to a current IMO review of MARPOL Annex V, with specific attention to be paid to the management and control of derelict fishing gear. Another Economy stated that it has worked substantially on a FAO/UNEP review of "The Problem of Derelict Fishing Gear. Global Review and Proposals for Action." Another Economy noted its status as a party to the <i>London Dumping Convention</i> and expressed the opinion that this instrument addresses the issue of the dumping of derelict fishing vessels.

Discussion of Organisational Perspectives (from the Survey of Organisations)

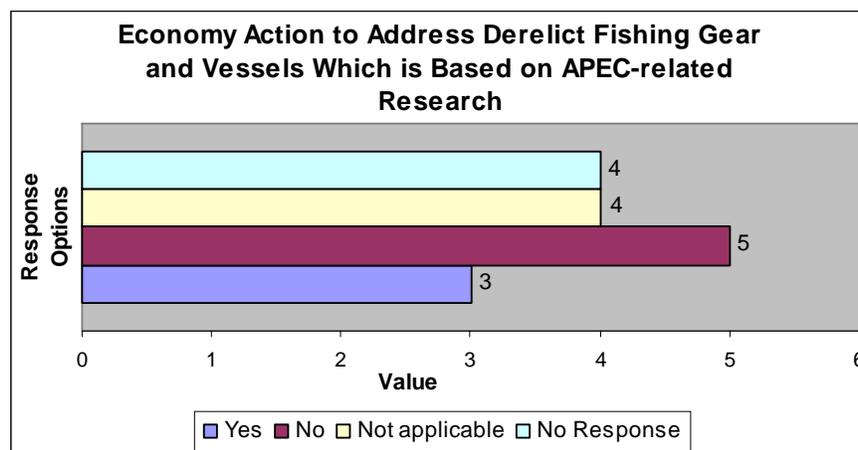
Ten organisations reported that they have taken no actions to help address the problem derelict fishing gear and vessels. Of the three that did declare activity on this issue, all were either an IGO or RFMO. One IGO noted that UN General Assembly Resolution A/RES/60/31 (para. 80) encourages States, UNEP, GPA, FAO, IMO, RFMOs, and other relevant organisations to support the efforts of APEC to address derelict fishing gear. A NGO expressed the opinion that a weakness of current sustainable fishing certification programs is that they do not directly address the issue of derelict fishing gear and vessels.
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Section Summary

The strong positive response to this question, combined with qualitative data indicating measures such as: studies, buy-back programs, vessel monitoring, inspections, guidelines, etc., suggest that Economies generally recognise the importance of this issue and are taking steps to address it. The BPA Action Item does not directly call for a strengthening of efforts, and thus the question does not explore the extent to which these are new initiatives. However, certain Economies note that they are participating in current programs with IGOs to review relevant international law and guidelines.
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Question 20	Relates to BPA Action: I.b.viii
If you answered 'Yes', to question 19, are these actions implementing recommendations from APEC-related research?	Support efforts to address derelict fishing gear and derelict vessels, including the implementation of recommendations from research already undertaken in the APEC context.



Interpretation of Quantitative Data

A total of 11 Economies answered 'Yes' to Question 19. However, only three Economies responded positively to this question. Five Economies stated definitively that their actions to address derelict fishing gear and vessels are not implementing recommendations from any APEC-related research.

Domestic Initiatives

None reported.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

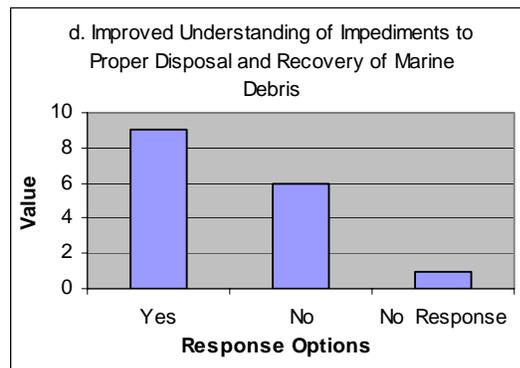
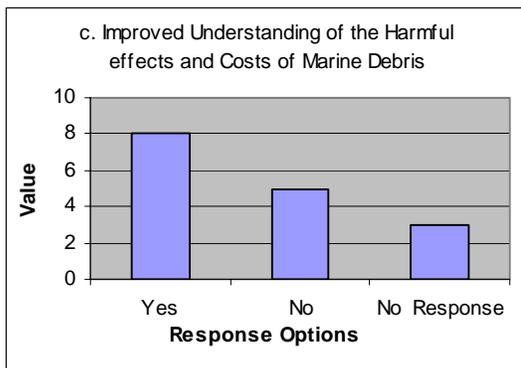
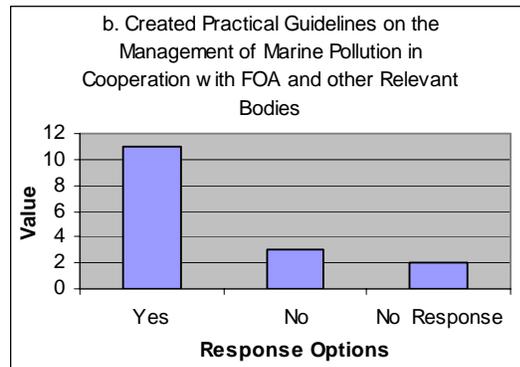
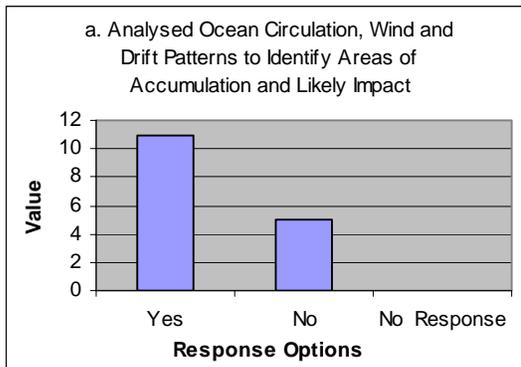
No organisation made reference to any APEC-related research on this topic.

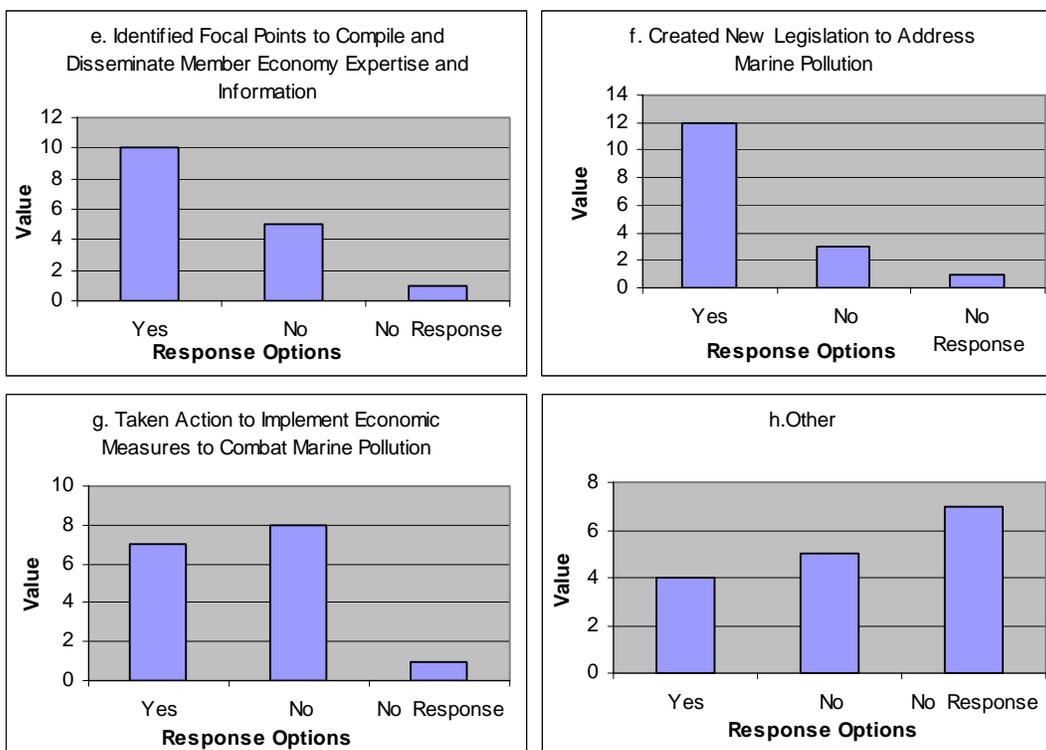
Section Summary

This question does not explore whether any Economy that responded negatively has done so because they are unaware of any relevant APEC-related research, or because they do not find the recommendations arising from such research to be applicable / useful. However, given that the 'Not Applicable' response option caters to those Economies that replied negatively to Question 19, the fact that four other Economies declined to answer this question suggests that the explanation might be the former (i.e. on the assumption that a conscious rejection of APEC research recommendations would have been more likely to evoke a negative response than silence).



Question 21	Relates to BPA Action: I.b.ix
<p>Please indicate which of the following actions your Economy has undertaken to address marine pollution.</p> <p>a) Analysed ocean circulation, wind and drift patterns to identify areas of accumulation and likely impact;</p> <p>b) Created practical guidelines on the management of marine pollution in cooperation with FAO and other relevant bodies;</p> <p>c) Improved understanding of the harmful effects and cost of marine debris;</p> <p>d) Improved understanding of impediments to proper disposal and recovery of marine debris;</p> <p>e) Identified focal points to compile and disseminate Member Economy expertise and information;</p> <p>f) Created new legislation to address marine pollution;</p> <p>g) Taken action to implement economic measures to combat marine pollution;</p> <p>h) Other.</p>	<p>Identify ways to: analyse ocean circulation, wind and drift patterns in the Asia-Pacific region, areas of accumulation and likely impacts; improve understanding of the harmful effects and costs of marine debris; improve understanding of impediments to proper disposal and recovery; and determine focal points to compile and disseminate Member Economy expertise and information and create practical guidelines, in cooperation with FAO and other relevant bodies.</p>





Interpretation of Quantitative Data

The quantitative data indicates extensive and broad-ranging action by APEC Economies to address marine pollution. Eleven Economies reported that they have undertaken analysis of ocean circulation, wind and drift patterns to identify areas of accumulation and likely impact. A total of 68% of Economies observed that they participate in the development of practical guidelines to manage marine pollution in cooperation with either FAO or other relevant bodies. Half of the responding Economies declared that they have improved their understanding of the harmful effects and costs of marine debris, and slightly more than half indicated an improved understanding of the impediments to proper disposal and recovery of marine debris.

Sixty two percent of Economies declared that they have identified focal points to disseminate expertise and information, and 75% that they have created new legislation to address marine pollution. However, only seven Economies claimed to have implemented economic measures to combat marine pollution. Finally, four Economies reported other actions to address marine pollution.

Participants at the BPA Implementation Workshop at Manado in November 2007 noted that the key challenges in addressing marine pollution include land-based sources of pollution, harmful algal blooms, marine debris, and sea-based sources of pollution. They further concluded that domestic efforts to address land-based source of pollution, particularly the problem of sewage, continue to be challenged by weaknesses in regulation, problems of jurisdiction, inadequate enforcement, lack of financial capacity, and a lack of understanding on how to use appropriate technology. These challenges are reflected also in some of the qualitative Economy responses.

Domestic Initiatives

a) *Analysed ocean circulation, wind and drift patterns to identify areas of accumulation and likely impact*

The Sea Institute of an Economy was said to have developed an ocean circulation model to



forecast the dispersion of domestic sewage discharges under oceanographic influences. A developed Economy also stated that it utilises the BLUElink ocean forecast model to investigate the origins and pathways of marine debris. Another Economy reported that it has developed an Oil Spill Model to predict the movement of an oil spill, thus helping to minimise the ecological and economical impact. Similarly, an Economy observed that it conducts ongoing research to determine the influence of winds, ocean circulation, and El-Nino events on the deposition of debris. In addition, small scale studies were said to be carried out in four Economies. One Economy reported that it commissioned a project to analyse the physicochemical, bacteriological, weather and hydrodynamic data of beach water. In another Economy, the impact of "international waves" on the coast was said to be studied. Observation of oceanographic conditions helped an Economy to accumulate data for further studies.

b) Created practical guidelines on the management of marine pollution in cooperation with FAO and other relevant bodies

A developed Economy maintained that it enforces IMO Safety and Environmental Conventions. The Economy stated that it has developed guidelines and educational materials dealing with marine pollution, along with a program specifically to address marine debris. The transport department of an Economy was also said to have developed manuals to prevent marine pollution from shipping based on UN guidelines. A developing Economy reported that collaboration with NGOs and the private sector resulted in guidelines on general practices in dealing with marine pollution. Three Economies observed that they have developed a contingency plan for oil spills and pollution incidents by hazardous substances. One of these Economies also reported that it has created guidelines that are fully targeted on oil spills. Additionally, this Economy noted that it conducts annual equipment deployment and incident management exercises for oil and chemical spills. One Economy cited development of a National Action Plan under the UNEP-GPA. Interestingly, a developed Economy declared that this question is not applicable to it.

c) Improved understanding of the harmful effects and cost of marine debris

Having the largest coastline in the world, a developed Economy reported that it has carried out research; held awareness programs along with other Economies; and has voluntary clean ups to encourage better waste disposal. Similarly, four other Economies cited public education and research as the method to improve understanding on marine debris. Additionally, one Economy reported the implementation of relevant policies by improving its legal and constitutional framework. Extensive R&D by one of these Economies was said to include ongoing trials conducted by a local University on a ballast water treatment system and a water quality monitoring program. The latter aims to monitor/measure any changes to the water parameters resulting from major coastal projects. In addition, that Economy observed that environmentally friendly glass-flake paint has replaced the antifouling paints on all navigational buoys in its waters since 1994. Furthermore, a study was reported on the unique marine biodiversity found in port waters to enhance understanding of biofouling patterns and improve biodiversity management. An Economy noted that it has a specialised fleet of refuse collection vessels to collect marine debris.

d) Improved understanding of impediments to proper disposal and recovery of marine debris

The best method to address marine debris, according to a developed Economy, is via research: "As difficulties and need are identified, best practices are developed and implemented at the local level to improve recovery and disposal". Two Economies cited improved understanding of impediments to the disposal of marine debris through a National Oil Spill Contingency Plan, while another Economy developed a program to promote technology for the reduction and recycling of fishing gear in response to the marine debris issue. Another Economy reported that it is developing a 'Threat Abatement Plan' to address the impacts of harmful marine debris on protected marine species.

e) Identified focal points to compile and disseminate Member Economy expertise and information

Almost all respondent Economies cited their Department of Environment or Marine Department as the focal points for dissemination of expertise. However, one developed Economy stated that it has set up an inter-agency marine debris coordinating committee. The



committee members are tasked to promote expertise and disseminate information, and work together to achieve goals.

f) Created new legislation to address marine pollution

One Economy reported that it has passed extensive legislation (although not all new) to satisfy the requirements of MARPOL, including:

- Protection of the Sea (Prevention of Pollution from Ships) Act 1983
- Navigation Act 1912 (Division 12, 12A, 12B, 12C, 12D of Part IV)
- Protection of the Sea (Prevention of Pollution from Ships) (Orders) Regulations
- Marine Orders, Part 91 (Marine pollution Prevention-Oil)
- Marine Orders, Part 93 (Marine Pollution Prevention-Noxious Liquid Substances)
- Marine Orders, Part 94 (Marine Pollution Prevention-Harmful Substances in Packaged Forms)
- Marine Orders, Part 95 (Marine Pollution Prevention-Garbage)
- Marine Orders, Part 96 (Marine Pollution Prevention-Sewage)
- Marine Orders, Part 97 (Marine Pollution Prevention-Air Pollution)
- Various other complementary legislation applicable to coastal waters.

Likewise, another Economy observed that it has implemented legislation giving effect to Annexes I, II, and V of MARPOL, and that this legislation is constantly being updated and amended (e.g. recent amendments include the phase-out of single hull oil tankers and restrictions on the carriage of heavy oil under Annex I). This Economy also reported that it has passed legislation relating to the 1996 Protocol to the London Convention; the OPRC 90; CLC/Fund 92 on liability for oil pollution damage from oil tankers; and a range of comprehensive laws regulating discharges from offshore installations in continental waters.

A lesser-developed Economy also outlined relevant legislation including:

- Supreme Decree-087-2004 PCM Ecological and Economic Zoning Regulation.
- Supreme Decree N° 086-2003 PCM National Strategy on Climate Change
- Directory Resolution N° 072-2006/DCG dealing with marine alien species associated with ballast water.
- Directory Resolution N° 0523-02/ DCG dealing with the shipments of potentially hazardous liquids.

Additionally, that Economy reported that there are Maximum Permissible Limits and mechanisms for monitoring effluents from the fish meal industry. A number of other Economies also reported legislation including laws on: Prevention of Pollution of the Sea Act in response to all 6 Annexes adopted in MARPOL; Management of Coastal and Small Island Law and Law on the Conservation of Natural Resources; Aquaculture Waste Water Standard and the Fish Pier Waste Water Standard; Clean Air Act and Clean Water Act; Marine Environment Protection Act and an Act on 'Conservation and Protection of Marine Ecosystems', as well as a 'Basic Maritime Law'. Conversely, one Economy simply reported that existing legislation "is sufficient".

g) Taken action to implement economic measures to combat marine pollution

An Economy highlighted its efforts to combat marine pollution through a 'Harbour Area Treatment Scheme' and 'Safety and Environmental Payment Scheme'. Sewerage Treatment charges were increased in the former scheme, and the latter rewards construction outcomes that meet good environment standards. Violation of pollution control regulations are sanctioned. Apart from penalties, another Economy reported that it pays for debris collected during fishing operations. Additionally, an Economy noted that it has a National Commission to execute a local action plan as part of a program for the 'Protection of the Marine Environment and Coastal Zones of the Southeast Pacific'. A developed Economy, stated that its rules require ships carrying more than 10 tonnes of oil to be levied, providing funds for a National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances. This Economy said that it also requires all ships over 400 tonnes to carry insurance for marine pollution, and that heavy fines (e.g. Marine Pollution Act 1987 provides penalty up to 10 million dollars) serve as a deterrence to non-compliance.



h) Other

A developed Economy reported that it has developed national guidelines on marine debris data collection and monitoring. Another Economy noted that it facilitates the sharing of weather forecasts, wave, sea surface temperature and tide information within relevant authorities. Also, work on a 'Harbour Area Treatment Scheme' was said to include sewage treatment. Relevant studies were also noted on various issues (e.g. pharmaceutical products in treated sewage, marine disposal sites for contaminated mud, the trial of small wastewater treatment facilities in unsewered areas, and the development of protocols for chronic effluent toxicity).

Regional Initiatives

An Economy noted that it funded the 'Pacific Sea Board R&D Program'. Also research on marine debris tracking was said to be run by a developed Economy in the North Pacific Ocean, which publishes data on SST, winds and wave forecasts for use in the region.

One Economy, reported to be a member of the Revolving Fund (established to provide funds for use in combating oil pollution), and states that it plans to initiate a large scale oil spill response exercise among littoral states in 2009.

A developed Economy noted that it oversees an APEC project on "Understanding the benefits and costs of controlling marine debris in the APEC region", and another said that it participates in the Arctic Council's Regional Program of the Arctic.

An Economy noted that a workshop was held as part of a 'Regional Protocol on Contamination from Land-Based Sources' which concluded that "There was not a standard international definition on marine debris." The protocol was said to have established laws and taken measures to prevent, reduce, and mitigate marine debris.

Relevant International Initiatives

One Economy reported that it plans to work with the IRD (a French research institute) to study the harmful effects of different natural and anthropogenic disturbances, for instance, the effect of EL-Nino on circulation patterns.

Two Economies reported that they are a party to OPRC-HNS. A developed Economy also observed that it has worked with the 'UNEP/Caribbean Environment Program' on a 'Marine Debris draft Action Plan for the Wider Caribbean Region'. One developed Economy reported that it has fully implemented all the annexes of MARPOL and another stated the application of Annexes I (oil), II (noxious liquid substances), III (harmful substances in packaged form), IV (sewage), V (garbage) and VI (air pollution) in the EEZ. This Economy also reported working extensively with IMO and FAO on similar issues. Several other Economies reported providing guidance in the international arena. Two Economies observed that they issued a guidance note on implementation of the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter, 1972. Another Economy reported contributing to 'Sediment Quality Guidelines' with UNEP, while another Economy cited working with the FAO on 'Environmental Guidelines for Fish Processing, Artisan Fisheries and Aquaculture'.

Within the framework of UNEP, another Economy reported adopting the 'Northwest Pacific Action Plan' (NOWPAP) to improve understanding of the harmful effects of marine debris. Meanwhile, a developed Economy cited that it acts on a Steering Committee for 'Guidelines on the use of market-based instruments to address the problem of marine litter'. Another developed Economy cited implementing a 'National Program of Action' in response to 'Global Program of Action for the Protection of the Marine Environment from Land-Based Activities'.

Of further interest was the observation made by one Economy that reported the existence "loopholes" in MARPOL, i.e. noting that MARPOL does not deal with marine debris generated by ships under 400 GRT. A developed Economy cited its contributions to the current IMO review of MARPOL Annexes.



Two Economies reported their participation in Anti-fouling Convention and new regulations by the IMO as the basis for new domestic legislation.

Another Economy said that it signed the 'Bunker Convention', the 'Civil Liability Convention', and the 'IOPC Fund Protocol 92' to ensure adequate compensation schemes, are in place to respond to oil spill damage.

One Economy reported that it currently contributes to the development of international guidelines for UNEP on marine debris data collection and monitoring. Finally, another Economy observed that it has implemented a plan under the 'Stockholm Convention on Persistent Organic Pollutants', and has undertaken a study to assess the ecological risk of pollutants to marine mammals.

Discussion of Organisational Perspective (from the Survey of Organisations)

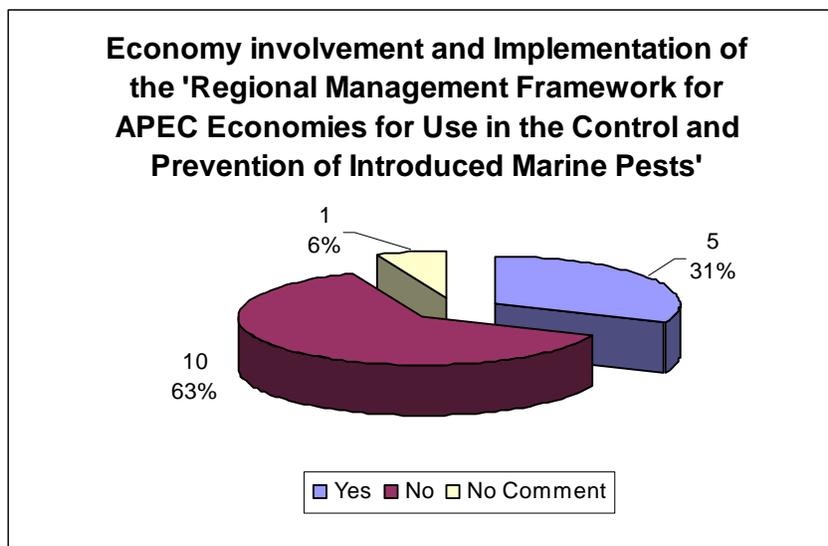
None reported.

Section Summary

The level of activity on oceanographic research suggests that Economies are keen to improve understanding of the behaviour of marine debris in order to help identify sources and minimize impacts. Although a majority of Economies reported that they have developed practical guidelines on the management of marine pollution, in the qualitative comments several of these revealed that these guidelines address only oil and chemical pollution. No Economy offered examples of effort to quantify the cost of marine debris. Seventy-five percent of Economies reported that they have created new legislation to address marine pollution, but qualitative comments indicate that many of these laws target only implementation of MARPOL standards. Fewer Economies claim to have implemented economic measures to combat pollution, and of the minority who did report having done so, many offered examples only of sanctions and penalties for transgression of environmental laws.



Question 22	Relates to BPA Action: I.b.x
<p>Since September 2005, has your Economy been involved in the development and implementation of the 'Regional Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests', specifically in support of the establishment of a network and capacity building?</p>	<p>Continue to develop and implement the Regional Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests, specifically in the support of the establishment of a network and capacity building.</p>



Interpretation of Quantitative Data

The majority of respondents indicated that they have not been involved in either the development or implementation of the 'Regional Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests'. Although most comment in elaboration was contributed by the Economies that had responded positively to this question, there was no evidence offered of initiatives taken directly under the APEC Regional Management Framework. Rather, the qualitative data refers to actions taken more generally to combat introduced marine pests.

Domestic Initiatives

One Economy noted that continued efforts to develop and implement a 'Regional Management Framework for APEC Economies' has been subdued as a result of discontinued APEC funding for the project. This Economy stated that it no longer works towards progressing the Regional Management Framework, but continues to work on improving its domestic capacity "which could be a contribution in any future network".

Another Economy said that it is "not in the framework...and [that it] must become a member...[and that] there is now a draft agreement on the issue with a particular entity". However, no elaboration was offered on this comment.

An Economy that responded 'no' to the question, stated that it will "...need time and resources to coordinate with other institutions...as well as to assess our capacity". Another Economy that indicated 'no', stated that this was due to a "lack of expertise". Seven Economies did not provide any elaboration, while another Economy stated that its involvement in developing a regional management framework was "not applicable".



A positive respondent Economy reported that it has established a committee within a government department to address 'alien species', and another Economy noted that it has implemented a 'National System for the Prevention and Management of Marine Pest Incursions'.

An Economy reported the development and implementation of an 'Invasive Species Strategy', including the goal to establish a 'Centre of Expertise in Risk Assessment'. That Economy also reported funding and capacity provision for five government departments to control marine invasive species. These government departments were said to be supported by a network of universities, scientists and other government departments that examine the science of invasive species in order to provide advice to decision-makers. One of these government departments was further reported to be developing a strategy on marine invasive species management relevant to aquaculture practices.

One Economy stated that it regularly inspects international vessels and also implements domestic, regional and international ballast water exchange and bio-fouling controls.

Regional Initiatives

A developed Economy reported assisting in the development of a 'Regional Strategy on Shipping-Related Introduced Marine Pests in the Pacific Islands' (SRIMP-PAC).

Another cited efforts to promote early ratification of the IMO Ballast Water Convention (IMO-BWC) and stated that it has contributed to developing the requirements for implementation of the IMO-BWC, along with associated guidelines, and has established a network in the region for the 'Control and Prevention of Introduced Marine Pests'.

An Economy reported that it cooperates with other countries to establish scientific networks and information exchange on marine pests.

Relevant International Initiatives

An Economy reported that it is building domestic capacity and developing experts, and that it has assisted to build capacity elsewhere through a GEF-UNDP-IMO Global Ballast Water Management Programme (GloBallast).

Another Economy noted that it is involved in the Ballast Water Working Group of the IMO, along with representatives from many other APEC Economies. GloBallast 2000-2004 was said to be complemented by the GloBallast 2 program which is scheduled for implementation. This Economy noted that the primary purpose of the GloBallast program is to build institutional strength and a mechanism for capacity building in emerging Economies.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Only two respondents in the Organisation Survey reported any activities associated with the problem of marine invasive species. In both cases, these were IGOs rather than non-government actors. Only one IGO offered elaboration, in which it noted its emphasis on management of marine invasive species rather than attempts to eradicate or avoid the problem. The rationale offered for such an approach was recognition that marine invasive species already inhabit many aquatic ecosystems throughout the Asia-Pacific region. Initiatives cited include: the development of risk assessment procedures, policy guidelines and institutional strengthening.

**Section Summary**

The survey response and elaborating comments suggest that Economies have a good awareness of the problem of introduced marine pests, and are taking measures domestically to address the problem. There is also evidence of some cooperation between Economies, but this effort does not appear to be as strong as that being expended within Economies. However, of interest, there is low indication of initiatives taken to combat the problem of introduced marine pests within the APEC framework.

One Economy noted that an earlier project to encourage the development of a relevant APEC Regional Management Framework no longer has funding, and cited this as the primary reason for discontinued effort on behalf of the initiative.

At the BPA Implementation Workshop at Manado in November 2007, participants observed that there is an increasing need to develop more programs to address the problem of marine invasive species due to climate change. Some proposals were made on how APEC could facilitate such additional effort, including: the creation of a regional inventory or linking of databases on species and their distribution; improved scientific knowledge through liaison with PICES; and improved training in the early detection and monitoring of invasive species through the APEC Marine Environmental Training and Education Centre (AMETEC).



Question 23	Relates to BPA Action: I.b.xi
Has your Economy ratified or adhered to, as appropriate, the IMO Ballast Water Convention?	Promote early ratification or adherence, as it is appropriate for the Economy, to the IMO Ballast Water Convention, including through investigation of a coordinated regional approach to marine invasive species in the Pacific Basin, with the involvement of IMO, FAO, APEC, South Pacific Regional Environment Programme (SPREP), Permanent Commission of the South Pacific (CPPS) and other relevant organisations.



Note: One Economy answered Yes and No - confirmation still pending.

Interpretation of Quantitative Data

Half of respondent Economies indicated that they have not “ratified or adhered to” the IMO Ballast Water Convention. However, IMO-BWC was only adopted by consensus at a Diplomatic Conference at IMO in London on 13 February 2004. This means that Economies have had relatively little time to examine, consider and prepare for ratification. Viewed in this light, ratification or adherence by 47% of responding Economies could perhaps be considered a strong indication of support. One Economy returned an invalid response.

Domestic Initiatives

An emerging Economy that indicated ‘No’ to this question, stated that it “lacks port reception facilities”. Another declared that it is preparing for implementation locally.

One Economy indicated that it plans to ratify the Convention after the establishment of relevant domestic laws. A developed Economy stated that it expects to ratify the convention in 2008 and currently has “Ballast Water Control and Management Regulations” in place that came into force in 2006. These regulations were said to contain all the IMO-BWC requirements. Another developed Economy noted that since 1998, they have adhered (although not yet ratified) to equivalent requirements relating to mid-ocean exchange of ballast water, and currently has published a discussion paper on ratification, which has been distributed for public comment.

Regional Initiatives

None reported.

**Relevant International Initiatives**

None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

None offered by Organisations.

Section Summary

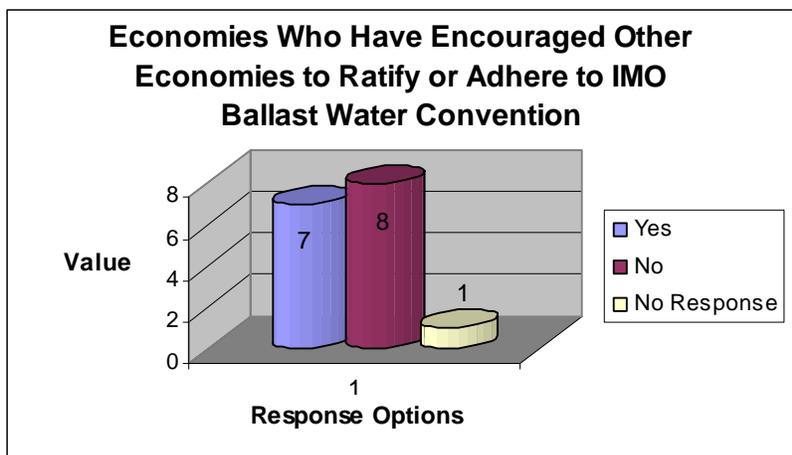
Instruments of codified international law rarely take form and enter into force rapidly. In the case of IMO-BWC, the first calls for IMO to take action can reasonably be identified as the UNCED Conference in Rio de Janeiro in 1992. By 2002, IMO was again urged at the World Summit on Sustainable Development (WSSD) to take action against invasive species in ballast water by completing the IMO-BWC text. Even so, another 18 months were to pass before the Convention was finally done at London in 2004.

Importantly, under the *Vienna Convention on the Law of Treaties*, 1969, (Article 26) 'Every treaty in force is binding upon the parties to it and must be performed by them in good faith' also, (Article 27) 'A State party to a treaty may not invoke the provisions of its internal law as justification for its failure to perform the treaty'. Therefore, States need time to examine their ability to perform the treaty and amend or pass legislation to ensure that they fulfil their obligations under international law.

Such being the nature of international treaty law, the fact that nearly half of the respondents to this survey indicated that they have either ratified or adhered to IMO-BWC augers well for the eventual entry into force of this important instrument.



Question 24	Relates to BPA Action: I.b.xi
Has your Economy encouraged or assisted other APEC Economies to ratify or adhere to the IMO Ballast Water Convention?	Promote early ratification or adherence, as it is appropriate for the Economy, to the IMO Ballast Water Convention, including through investigation of a coordinated regional approach to marine invasive species in the Pacific Basin, with the involvement of IMO, FAO, APEC, South Pacific Regional Environment Programme (SPREP), Permanent Commission of the South Pacific (CPPS) and other relevant organisations.



Interpretation of Quantitative Data

Most Economies reported that they have not encouraged or assisted other APEC Economies to ratify or adhere to the IMO-BWC. However, conversely, nearly half indicated that they have done so. Review of the qualitative data offered in elaboration to this question reveals that the nature of such encouragement or assistance would likely have been through an IGO or multilateral fora, or by way of technology development.

Domestic Initiatives

An emerging Economy stated that it has a “lack of expertise” in this area.

One Economy observed that although it has not encouraged other Economies, it will monitor developments, and communicate as necessary with neighbouring maritime authorities through regular meetings.

A developed Economy, declared that it has signed the Convention and agreed to be bound by it, and that it will lodge instruments of ratification once domestic laws are in place.

Another developed Economy indicated efforts at the domestic, regional and international level, and said that it is engaged in the “testing of technologies necessary to meet the standard set forth in the Convention”.

An Economy stated that it has an “Interjectorily Commission” that reviews IMO matters and recommends any necessary measures to the Navy for administration.



Regional Initiatives

One Economy stated that, through bilateral meetings with two neighbouring Economies, it has “already explained progress in establishing relevant domestic laws” in preparation for ratification, and that once these laws are in place it will ratify the convention.

A developed Economy observed that the outcome of some of its projects (e.g. research on sediment issues associated with ballast water) will help other Economies adhere to the convention.

An emerging Economy reported that it assists other Economies by working with an IGO (where other APEC Economies are also members) to promote ratification and adherence.

Awareness was also said to have been promoted by an Economy through courses conducted under an MOU with IMO on Third Party Training; post graduate courses on shipping; an undergraduate and post graduate course on shipping and the marine environment; and regular international conferences on ballast water, research and development.

Relevant International Initiatives

An Economy stated that one of its government departments had “...recently updated the Risk Assessment software for the GloBallast program of IMO”, in order to make the software compatible with modern “Windows-based platforms”, and had added additional ballast water reporting and environmental data to the package for use in the GloBallast 2 program. Two other developed Economies also reported past involvement through GloBallast, aimed at assisting or encouraging other States to implement Convention measures.

Two Economies declared that they have “been actively involved in the development of guidelines adopted by IMO to assist in uniform implementation of the Convention”.

Discussion of Organisational Perspectives (from the Survey of Organisations)

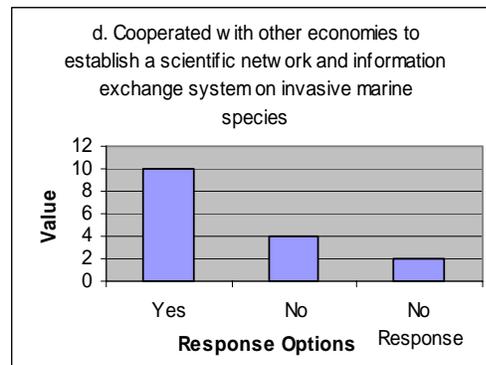
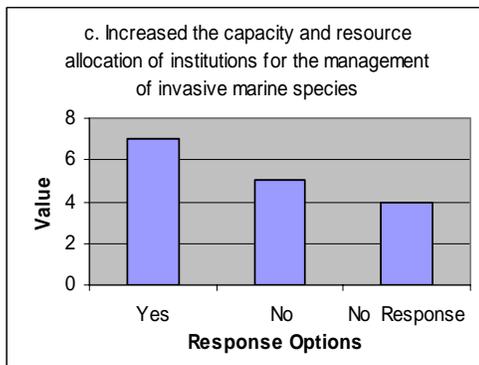
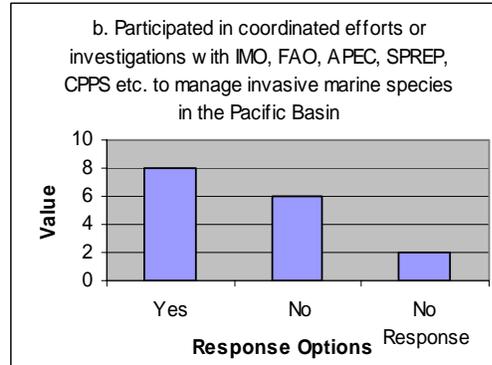
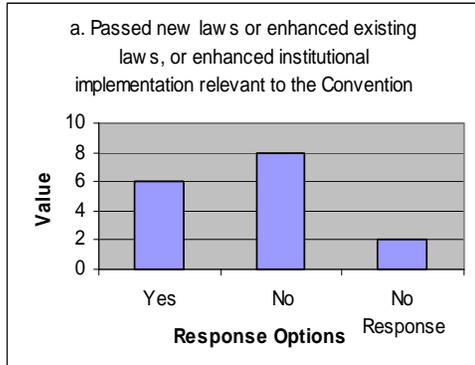
Only a minority of responding organisations indicated any direct activity related to the problem of marine invasive species. However, of those that responded positively, the nature of their involvement does appear to be directed at lending assistance to Economies, for example: as advisors to national committees, involvement in government programs, or through development of guidelines etc. Although these activities do not directly encourage ratification of the IMO-BWC, they would appear to promote adherence, which would help pave the way to eventual participation to the Convention.

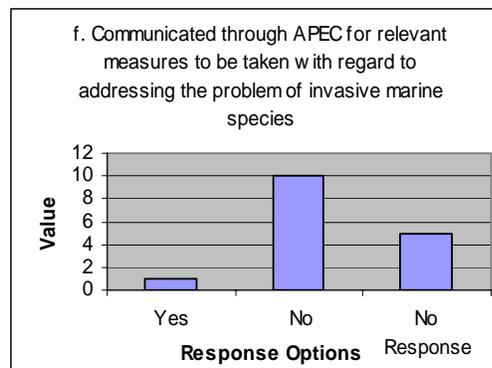
Section Summary

In the absence of shared concern over a mutual problem or boundary, States would normally not be expected to lobby other States directly to participate in a multi-lateral, global treaty. Such encouragement would more typically occur through advocacy at multi-lateral fora, such as IMO or relevant conferences. Therefore, the response rate of nearly half of the participating Economies indicating that they have encouraged or assisted other APEC Economies to ratify or adhere to the IMO-BWC is somewhat remarkable. The qualitative data does suggest active interest in addressing the problem of marine invasive species from ships ballast water and sediments by way of the IMO-BWC international legal instrument.



Question 25	Relates to BPA Action: I.b.xi, I.b.xii, I.b.xiii
<p>Please indicate which of the following actions your Economy has undertaken since September 2005, with respect to invasive marine species, and specify details where appropriate.</p> <p>a) Passed new laws or enhanced existing laws, or enhanced institutional implementation relevant to the Convention;</p> <p>b) Participated in coordinated efforts or investigations with IMO, FAO, APEC, SPREP, CPPS etc. to manage invasive marine species in the Pacific Basin;</p> <p>c) Increased the capacity and resource allocation of institutions for the management of invasive marine species;</p> <p>d) Cooperated with other Economies to establish a scientific network and information exchange system on invasive marine species;</p> <p>e) Introduced new or enhanced training for officials responsible for the control of invasive marine species;</p> <p>f) Communicated through APEC for relevant measures to be taken with regard to addressing the problem of invasive marine species.</p>	<p>xi: Promote early ratification or adherence, as it is appropriate for the Economy, to the IMO Ballast Water Convention, including through investigation of a coordinated regional approach to marine invasive species in the Pacific Basin, with the involvement of IMO, FAO, APEC, South Pacific Regional Environment Programme (SPREP), Permanent Commission of the South Pacific (CPPS) and other relevant organisations.</p> <p>xii: Reduce introductions of marine invasive species through all vectors, by increased training of officials to prevent and manage marine invasive species and to implement domestic, regional and international requirements; and cooperation to establish scientific networks and information exchange.</p> <p>xiii: Increase the communication among APEC fora relevant to addressing marine invasive species.</p>





Interpretation of Quantitative Data

Only six Economies indicated that they have passed new legislation or enhanced existing legislation on marine invasive species. Such a figure is consistent with the findings of Question 23 of this survey, which identified that less than half of the participating Economies have ratified the IMO-BWC. However, qualitative data reveals that several other Economies are in the process of developing new laws, regulations and strategies. Half of the responding Economies reported that they have participated in coordinated efforts or investigation with inter-governmental organisations such as IMO, FAO or APEC. Also, almost half stated that they have strengthened relevant institutions.

The strongest reported level of Economy participation was with regard to cooperation on the establishment of a relevant scientific network and information exchange system. However, an equally negative response to a question on whether APEC structures are used to communicate the need for measures to be taken to address marine invasive species suggests that such cooperation in information exchange may not necessarily be done through APEC. Most Economies reflected that they have engaged in training for officials responsible for the control of marine invasive species.

Domestic Initiatives

a) One Economy reported the establishment, in 2006, of a national law to control ballast water and sediment discharges from vessels that is related to IMO Resolution 868. A developed Economy also stated that it is creating new legislation that is consistent with the IMO-BWC and has been developing best-practice guidelines on bio-fouling. Another developed Economy declared that it has had Ballast Water regulations since 2006, and that recent funding will enhance enforcement of the regulations to prevent the introduction of marine invasive species. An emerging Economy reported that it is pursuing the establishment of relevant domestic laws and should have complete statutes by the end of 2008. Another cited the development of a national strategy for invasive species.

An Economy highlighted that it requires importers to provide full information on any introduced exotic fish species, along with an Environmental Impact Assessment, and that the importation of such species has to be approved prior to entry into the country.

b) None reported.

c) One Economy stated that it has "commissioned the experts to address the management mechanism of invasive marine species". It further reported that since the establishment of new legislation on marine conservation and ecosystem management in 2007, a budget has been secured to investigate marine invasive species and the effect these have on ecosystems. An emerging Economy declared that it has done "some research on harmful algal blooms". No further elaboration was given.

An Economy indicated that it has a budget over four years to implement a "National System for Prevention and Management of Marine Pest Incursions". An investment of resources in monitoring and risk assessment of marine invasive species was also reported by another



Economy, where a Centre of Expertise for Aquatic Risk Assessment has been established. Two Economies reported some funding provision for monitoring and training related to management of the same invasive species found in the waters of both. A developed Economy reported substantial expansion of government capacity to manage and control marine bio-security.

d) An Economy reported that, as a member of the Convention on Biological Diversity (CBD), it is developing a National Action Plan for Marine Conservation. Additionally, this Economy noted that it has produced a preliminary report on marine invasive alien species and held a workshop on emergent threats. Furthermore, this Economy stated that it created a database and an intra-Economy agreement for the exchange of information.

e) An Economy said that it has arranged training of surveyors for onboard-ship inspections to take place prior to its ratification of the IMO Ballast Water Convention. Two other Economies reported that they have conducted training and seminars to increase capacity in the management of invasive marine species. One of these Economies indicated IMO collaboration in these training efforts.

Liaison with a neighbouring Economy through a working group meeting, to share information and construct a network for information sharing, was cited as a training activity by one Economy. A developed Economy stated that it has trained marine inspectors who are now implementing enforcement aspects of domestic Ballast Water Control and Management Regulations. Another Economy reported that it regularly trains quarantine officers for inspection of ship ballast water and hulls (bio-fouling).

An Economy cited recent training of officers on invasive species risk assessment for early detection monitoring related to one specific marine invasive species.

Regional Initiatives

a) None reported.

b) A developed Economy observed that it has provided technical assistance to SPREP “in developing a marine pests strategy and has offered to participate in the second phase of the IMO Globallast program”. Another Economy noted its participation in two past GloBallast workshops held in the Asian Region. One Economy cited participation in coordinated efforts or investigations through COBSEA and PEMSEA, and a developed Economy noted that it has assisted in “the development of a regional strategy for implementing programs in the Pacific Island countries to control and prevent the introduction of marine pests”.

c) The same Economy that indicated a four-year budget to implement a “National System for Prevention and Management of Marine Pest Incursions” (see ‘Domestic Initiatives’ above), also reported the contribution of funds to a project to develop an international marine pest education consortium, which was said to include other APEC Economy members.

d) An emerging Economy cited cooperation for information sharing between members of Southeast Asian GOOS (SEAGOOS) and North East Asian Regional GOOS (NEARGOOS). Another Economy reported that coordinated efforts occur through two regionally focused IGO’s.

One Economy stated that with the support of seven institutions, including the American Bureau of Shipping, it has undertaken “Shipboard Trials of Ballast Water Treatment Systems for the Prevention of Transfer of Harmful Organisms”. The final report of the trials is due to be published.

A bilateral information exchange on a particular marine invasive species between two APEC Economies was cited. Two other Economies stated that they have partnered with a third APEC Economy (i.e. scientists) under the NAFTA Commission for Environmental Cooperation (CEC), where one Economy was designated as being responsible to develop risk assessment methodologies and assessments. This commission was formed under the North American



Agreement on Environmental Cooperation (NAAEC). Additionally, one of the participating Economies indicated that on behalf of, and in conjunction with APEC Economies, it is studying the role of sediment and invasive species in ships.

A developed Economy stated that it has established active liaison with other countries to identify and collate information on marine pests.

e) One Economy, which reported domestic training of quarantine officers, also indicated that regional/international efforts are underway to establish professional development courses through an international marine pest education consortium, which will be suitable for government officials. This marine pest education consortium was said to be supported by the efforts of three developed Economies.

Another Economy noted that it conducts courses under a memorandum of understanding with IMO on Third Party Training; Post Graduate courses on shipping; an undergraduate and post graduate course on shipping and the marine environment; and regular international conferences on ballast water, research and development.

f) An Economy stated that during a meeting of the APEC MRCWG in 2007, it "...raised the issue of bio-fouling as a critical pathway for invasive species". The Economy claimed the need for international action on this issue was noted, and through an inter-Economy/NGO effort it has "...been successful in getting the investigation of measures to address bio-fouling on the IMO agenda".

Relevant International Initiatives

a) None cited.

b) A developed Economy stated that it has updated GloBallast Risk Assessment software in conjunction with IMO. Another Economy noted that IMO bilaterally supports SPREP's Pacific Invasives Learning Network (PILN) program, and that it has encouraged Economies to find out more about the GloBallast partnership. Additionally, this Economy reported that it is active in developing implementation guidelines for the Convention.

c) One Economy noted that a private marine transport company has provided US\$50,000 to the IMO GloBallast Project.

d) An Economy reported active involvement in the Global Invasive Species Database (GISD), that aims to increase awareness on invasive species to facilitate effective prevention and management. The GISD is an IUCN-World Conservation Union initiative developed by the Global Invasive Species Programme (GISP). One Economy cited hosting international conferences and exhibitions on ballast water management with support of IMO Globallast.

e) None reported.

f) An Economy stated that although they do not communicate measures to address invasive marine species through APEC, they have communicated measures with two other APEC Economies through IMO Ballast Water Working Groups.

Discussion of Organisational Perspectives (from the Survey of Organisation)

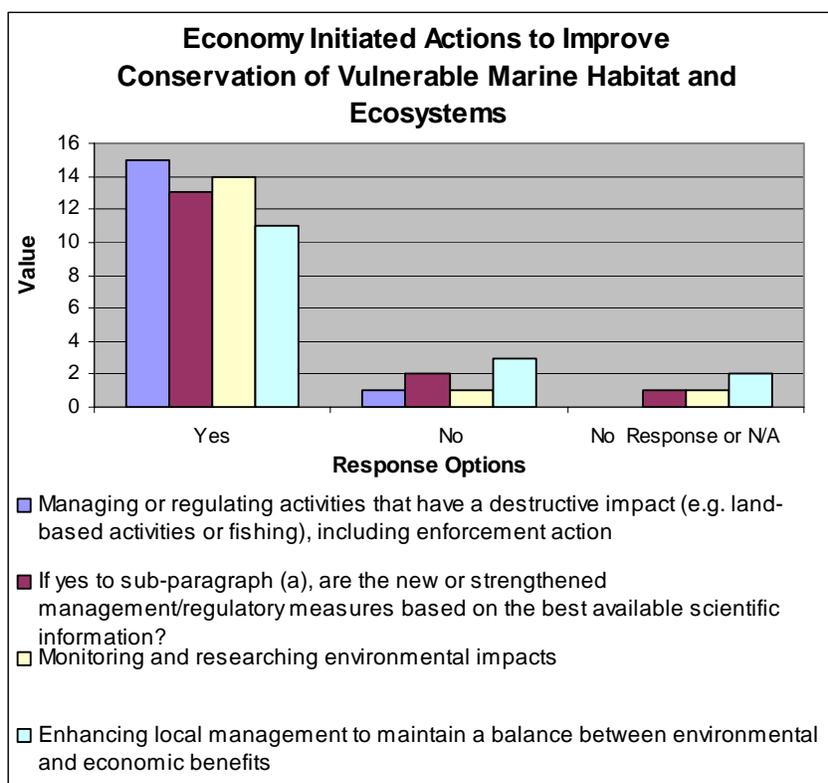
The surveyed organisations are reasonably active in helping to strengthen Economies with skills and knowledge relevant to the prevention and management of marine invasive species. Almost half of the responding organisations indicated that they provide relevant training to officials, assist in facilitating the requirements to reduce the introduction of marine pests or cooperate in the establishment of relevant scientific networks and information exchange. However, only one organisation stated that such activities were undertaken within the APEC framework.

**Section Summary**

This survey question furnished a rich array of material that reflects considerable activity for the control and management of marine invasive species across the fields of: legislative enhancement; coordinated effort with relevant IGOs; capacity building; cooperation for scientific and information exchange; and training. Although much of this activity was reported to take place in association with other APEC Economies, the survey has revealed that these Economies, almost without exception, do not see APEC as the relevant fora to develop measures to combat marine invasive species. In response to an earlier question in this survey (see Q22), an Economy noted that there is no funding allocated for an institutional effort in this regard by APEC, and this factor may have discouraged Economies from recognising such a role for APEC.



Question 26	Relates to BPA Action: I.b.xiv
<p>Please identify whether any of the following actions have been initiated or enhanced by your Economy since September 2005, to improve conservation of vulnerable marine habitats and ecosystems.</p> <p>a) Managing or regulating activities that have a destructive impact (e.g. land-based activities or fishing), including enforcement action;</p> <p>b) If yes to sub-paragraph (a), are the new or strengthened management/regulatory measures based on the best available scientific information?</p> <p>c) Monitoring and researching environmental impacts;</p> <p>d) Enhancing local management to maintain a balance between environmental and economic benefits.</p>	<p>Improve the conservation of vulnerable areas by: managing activities having a destructive impact on these areas and associated species, based on the best available scientific information; increasing monitoring and research; and enhancing local management, as appropriate, to maintain environmental and economic benefits.</p>



Interpretation of Quantitative Data

Almost all Economies reported action and progress since September 2005 to improve the conservation of vulnerable areas. All but one participating Economy reported enhanced management or enforcement to control activities that have a destructive impact. Thirteen Economies observed that actions to reduce destructive impacts were based upon best available scientific information, while fourteen Economies (87%) also reported enhancement in monitoring and research. Approximately 70% of respondent Economies declared that they have enhanced local management to maintain environmental and economic benefits.



However, participants at the BPA Implementation Workshop at Manado, in November 2007, highlighted that effective and sustainable management of vulnerable marine areas in the APEC Region would benefit from further work that emphasised the socio-economic values of marine habitat.

Domestic Initiatives

a) Managed or regulated activities that have a destructive impact (e.g. land-based activities or fishing), including enforcement action

One developed Economy stated that it supports the United Nations General Assembly resolution 61/105 on RFMOs of which it is a member. The UNGA 61/105 relates to the impacts of bottom fishing on vulnerable marine ecosystems. This Economy also reported that since September 2005, it has closed over 1.2 Million square kilometres of EEZ to bottom impacting fishing methods (Benthic Protected Areas Closures). Another developed Economy reported that it is currently creating a policy to manage the impacts of fishing on sensitive benthic areas that will be applied to the EEZ as well as Economy-flagged vessels outside of national jurisdiction. This Economy also indicated that it has developed a new 'Fisheries Management Decision-making Framework', which includes application of the precautionary approach, consideration of ecosystem needs, and provision of a mechanism to assess management outcomes against objectives to identify gaps and improvement needs.

Another developed Economy cited comprehensive actions in fisheries management, and coastal zone management through plans; decisions by councils; ensuring regulations and fisheries closures; as well as increasing enforceability through international MSC initiatives and continued use of observer programs, while a further stated that "impact studies on biodiversity are implemented, where necessary, in coastal and marine developments", and that an "...environmental management and monitoring program (EMMP) is usually also implemented to monitor and control impacts from development".

Fishing practices that use toxic substances or explosives have been banned in three lesser-developed Economies, while one of these Economies also banned the use of electricity, and prohibited trawlers from fishing within three miles of its coast.

The establishment of 40 MPA island areas, legislation prohibiting destructive fishing methods, and regular enforcement by fisheries officers were actions reported to be taken by an emerging Economy to improve conservation of marine resources. Another emerging Economy indicated that it has set aside additional budget "...for field management..." of a marine area equivalent to a tropical LME.

One developed Economy reported that it has "...a Fisheries General Regulation with Environmental Guidelines". No further elaboration was provided as to the extent, nature and actions within the regulations or guidelines. An Economy reported training on ICM, while another promoted public awareness and one cited legislative initiatives related to fishing and marine conservation.

Three relevant fields of activity or action were reported by an emerging Economy: firstly, it claimed to have "developed a regional action program to prevent marine pollution from activities on land", and to have studied anthropogenic sources of marine pollution in collaboration with local government and academia. Secondly, wildlife legislation was said to have been amended to protect mangrove habitat; and thirdly, a workshop was cited on "sustainable fisheries in protected natural marine and coastal area" with Protected Natural Areas (PNA) managers. This workshop was reported to have focused on criteria for sustainable fisheries; the harm of non-selective gear and issues of by-catch; resources allocation and the role of authorities; the application of baselines for indicators; and the development of actions to promote responsible fishing.

Another Economy stated that it has amended marine park and reserves regulations to strengthen control over tourism impacts, and introduced "...Core Area and Prohibited Zones into marine parks..." to protect habitat and species; "...designated no-anchor areas..." for "...coral protection"; enhanced monitoring of tourism activities; promoted codes of practice;



and promulgated voluntary codes of conducts for dolphin watching.

b) New or strengthened management/regulatory measures based on the best available scientific information

One Economy stated that measures are based on surveys and studies, and that they undergo regular review and amendment when required. A study that focused on coral response to sedimentation was reported to have been carried out to set tolerance levels, and another study centred on the ecological monitoring of coral at no-anchor sites aimed to monitor the performance of marker buoys.

Technical and scientific research, according to one Economy, is the basis for a regional action program to prevent marine pollution from activities on land. The outcomes from this workshop were reported to be based on the best scientific information available.

Research conducted in another Economy was reported to have proven that the zoning of a marine park had positive environmental outcomes and therefore that compliance with zoning needs should be enforced.

One Economy indicated that it has undertaken some efforts to survey coral reefs within its marine parks to provide information for management. This Economy also stated that research is undertaken prior to prohibiting a specific fishing gear. Another cited that fisheries and coastal zone management plans are “based on stock assessments; habitat requirements; and analysis of coastal health”. An Economy noted improvements in EIA practice and said that it has also adopted new marine/coastal resources legislation.

A developing Economy identified legislation in response to the question. Meanwhile, two Economies reported that research was done by state research agencies, and that recommendations from experts inform management outcomes. A developed Economy stated that environmental management and monitoring of coastal developments is based on a feedback system that is almost real-time.

One Economy declared that the use of scientific information is not applicable in the process of prohibiting destructive fishing practices, and two Economies did not elaborate although one of these had selected “Yes” in the quantitative response.

According to one developed Economy, recent management decisions by a RFMO have demonstrated a shift in practice to an approach that is based on science and ecosystems. Another developed Economy did not elaborate when it indicated that its management is based on best scientific information.

c) Monitoring and researching environmental impacts

A developed Economy stated that “implementation of new and improved measures had necessitated improved monitoring and research [of] environmental impacts...”. Another developed Economy reported the provision of funding for monitoring and research on environmental impacts in support of existing and new MPAs. While yet another developed Economy reported that it collects baseline information (either desktop or from field surveys) prior to developments in order to monitor changes in the environment through a EMMP framework.

Utilisation of the International MSC Network was cited by a developed Economy. It reported the continued use of fisheries observers “who are at the front lines of monitoring environmental impacts”. An emerging Economy reported regular monitoring by a research institute, as well as coral reef monitoring using the Reef Check methodology, and noted that there are additional plans for water quality monitoring due to start in 2008. Another developed Economy reported the establishment of a new tropical and marine science research facility and claimed that monitoring of water quality at coral reef sites had been enhanced through additional budget allocation.

One emerging Economy stated that “it continuously commissioned experts and scholars to monitor and research...” environmental “...impacts on marine habitat and ecosystems”.



Another Economy reported that vulnerable ecosystems (i.e. mangroves and wetlands) are considered under a system of MPAs and that actions are being planned for the sustainable use and conservation of these areas. An emerging Economy indicated that it has conducted monitoring of an MPA which contains soft coral and marine biota, and that monitoring was conducted during the development of a port adjacent to the MPA to determine effects on soft corals.

Monitoring and research efforts of an emerging Economy were reported to be done by a government ministry, with the support of universities, a science institute and NGOs. Another emerging Economy stated that it has carried out monitoring and surveying of coral reefs and seagrass beds. A developing Economy stated that most of its studies on the marine environment are due to the presence of the oil industry, and that other studies have assessed the impacts of agriculture on coastal lagoon and marine systems. One emerging Economy indicated that most biological monitoring is only conducted within marine parks or reserves, and that there is an annual reef check program. Furthermore, this Economy reported that surveys have been done to update ecological baseline information, and that a coral bioassay study recently established coral reef tolerance limits for sedimentation to establish standards.

There was no elaboration by one emerging Economy that had indicated 'Yes' to the question. Meanwhile another Economy reported ad-hoc monitoring and research, and a developed Economy declared that the question was not applicable.

d) Enhanced local management to maintain a balance between environmental and economic benefits

One emerging Economy reported that it has "arranged [a] marine park visitor liaison group to allow stakeholders to express views and [provide] suggestions..." on marine park management. Additionally, this Economy reported launching a diver certification program to enhance knowledge and understanding among this group on marine conservation. Another Economy reported that community liaison has been enhanced through the "...establishment of regional liaison roles". One emerging Economy indicated that it holds regular consultation and that there is a consultative management committee for two marine parks. An Economy indicated that it has a "Fisheries Management Council advisory board" and other consultative groups for marine sanctuaries, while another Economy reported the existence of local and national committees for coastal development projects. Development of principles for sustainable marine fisheries as an avenue for enhancing local management was reported in the response of one Economy.

A new project on "Hot Spots Monitoring" has been started by one emerging Economy to survey valuable areas towards establishing new MPAs. Another emerging Economy indicated that it was undertaking "training on integrated management for local government units". Whilst yet another emerging Economy indicated coordination with local government to achieve environmental management. A developing Economy reported a program to assist fishing villages with conservation measures, in conjunction with a program aimed at reducing the economic repercussions of a reduced fishery where recreational fisheries (i.e. promoting alternatives to tourism) is being promoted.

One developed Economy indicated that the question was not applicable, while another stated that all developments are "local in nature".

Regional Initiatives

a) Managed or regulated activities that have a destructive impact (e.g. land-based activities or fishing), including enforcement action

A developed Economy reported that a fisheries management body of which they are a member had adopted a proposal requesting the development of criteria to determine ecologically and biologically sensitive areas. At a subsequent meeting in 2006, this fisheries management body was reported to have adopted a proposal to protect potentially sensitive deepwater areas including seamount and hard coral areas, which led to a proposal to "...establish a Coral Protection Zone that is closed to all bottom-contact fishing gear..." for five years to enable data collection towards informing a long-term strategy.



- b) None reported.
- c) None reported.
- d) None reported.

Relevant International Initiatives

- a) None reported.
- b) None reported.
- c) None reported.
- d) None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

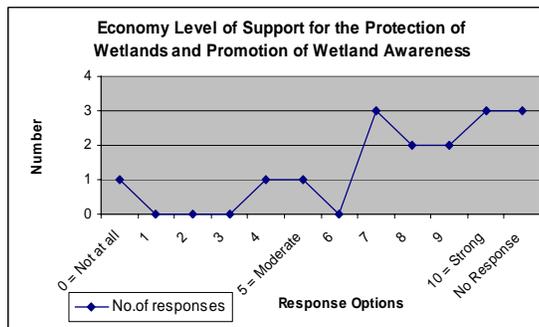
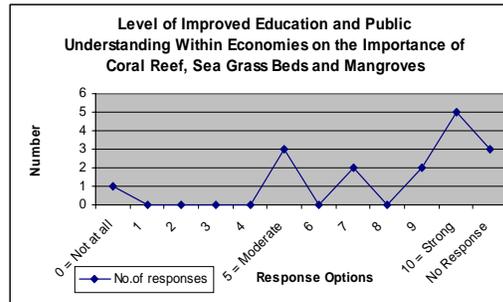
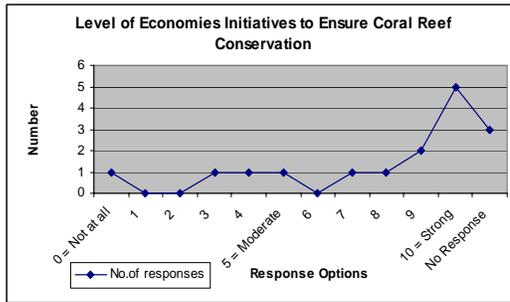
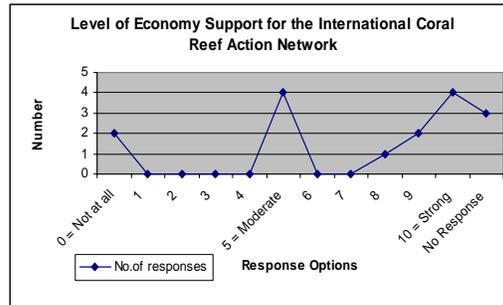
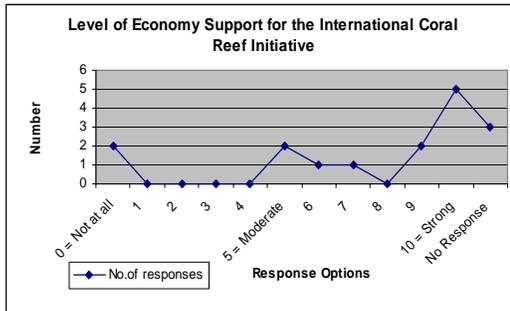
None reported.

Section Summary

The survey results demonstrate strong awareness and interest in the conservation of vulnerable marine areas by APEC Economies. Also, APEC Economies appear to have adopted a balanced approach involving improved management and regulation, along with strengthened monitoring and research. However, the slightly lower percentage of Economies that have placed emphasis on maintaining a balance between environmental and economic benefits supports the opinion of participants at the Manado BPA Implementation Workshop that there is scope to strengthen emphasis on socio-economic values in vulnerable area management.



Question 27	Relates to BPA Action: I.b.xv, I.b.xvi, I.b.xviii
<p>Since September 2005, to what extent has your Economy done the following:</p> <p>a) Supported efforts of the International Coral Reef Initiative?</p> <p>b) Supported efforts of the International Coral Reef Action Network?</p> <p>c) Undertaken domestic or regional initiatives to ensure coral reef conservation, such as decreasing marine debris or addressing destructive practices?</p> <p>d) Improved education and public understanding of the importance of coral reefs, sea grass beds and mangrove areas for sustaining ecosystems and economic benefits?</p> <p>e) Supported international and regional efforts for the protection of wetlands and promotion of wetland awareness?</p>	<p>xv: In particular, support the efforts of International Coral Reef Initiative (ICRI), and International Coral Reef Action Network (ICRAN) and other domestic and regional initiatives to ensure coral reef conservation, including decreasing marine debris and addressing destructive practices such as reef bombing and cyanide fishing.</p> <p>xvi: Improve, through education and outreach efforts, public understanding of: the importance of coral reefs, sea grass beds and mangrove areas to the overall marine ecosystem and to sustaining economic benefits; and, how to avoid degradation.</p> <p>xviii: Support international and regional efforts on the protection of wetlands and the promotion of wetland awareness.</p>





Interpretation of Quantitative Data

Quantitative responses show that support by APEC Economies for the 'International Coral Reef Initiative' (ICRI) and 'International Coral Reef Action Network' (ICRAN) is moderate to strong. The extent of activities undertaken by APEC Economies to ensure coral reef conservation, and to raise public understanding on the importance of coral reefs, sea grass beds, and mangroves to the overall marine ecosystem was also reported to be moderate to strong. Economies also maintained that they have shown generally strong support for international and regional efforts for the protection of wetlands and promotion of wetland awareness; however, such support was slightly weaker than that shown for coral reef conservation.

However, participants at the BPA Implementation Workshop, at Manado in November 2007, did highlight some significant challenges to effective conservation of coral reefs and other vulnerable areas, such as: climate change and acidification; use of destructive fishing practices; and an irresponsible live-fish trade.

Domestic Initiatives

a) A developed Economy stated that it only has one area with coral reefs, which has been within an MPA for nearly 30 years. Another Economy indicated that action is being planned for sustainable use and conservation in an effort to protect other ecosystems (i.e. mangroves and wetlands), under an MPA system.

"A Centre of Expertise on Corals"; co-funding research with NGO and academia to improve understanding of corals; and implementation of voluntary and mandatory measures to protect specific coral concentrations have been undertaken by a developed Economy. An Economy stated that it did not join the ICRI; however, "...as part of a national program...[it] monitors nine coral reef sites...to gauge the health of the coral reef ecosystems".

One Economy indicated that it coordinates with 'Reef Check' to conduct annual surveys on the status of coral communities, and that in 2006, 33 sites were surveyed by more than 300 volunteers. Additionally, this Economy reported that: coral reefs within MPAs are regularly monitored; two studies were done in 2005 to update distribution, diversity and taxonomic records of coral and that these findings will be useful for planning future MPA or management; and finally, that a study was done to develop tolerance standards for sedimentation on coral reefs.

A brief response noted the association of an Economy with "Best Reef Awards". However, the comment did not demonstrate clearly whether it is a supporter or a recipient of such awards. Another Economy reported participation in the ICRI since 2006, but no further details were given. One Economy declared its success through establishing and managing MPA. Two other Economies did not provide any elaboration although they ranked a high level of support for the ICRI.

b) One Economy stated that areas of high coral cover and diversity have been designated and managed through the marine park system. Additionally, this emerging Economy reported undertaking: "...feasibility studies to identify suitable sites for designation of marine parks", maintaining close ties with local, regional and international bodies to share knowledge and experience on coral research and management; and hosting a coral reef symposium to promote cooperation and collaboration for improved management in the region.

Successes through the provision of funding and collaborative networking at all levels were reported. An Economy also reported success through the ICRI network where it claims has enhanced coastal monitoring methodology, including for tidal flats, and resulted in a report on local MPAs. Furthermore, from 2008, this Economy plans to undertake cooperative coral reef and mangrove rehabilitation.

One Economy responded that it "is not a part of this network". Six Economies that ranked their support for ICRAN did not provide any elaboration.



c) One respondent Economy reported the completion of a coral conservation plan that provides a summary of efforts to-date and identifies issues and prioritises future actions. It also reported the closure of two coral areas to all fishing, and the partial closure of four sponge reef areas to ground-fish and shrimp fishing. Another Economy stated that destructive fishing practices are banned in its waters, and that marine debris is mitigated by regular clean-ups and with support of 'International Coastal Cleanup'. This international event is reported to be the largest volunteer effort in the world, held one day each year, and promoted through the Ocean Conservancy.

One Economy reported the establishment of a new conservation area (14,500 ha) of coral reef designated as a national park. The park is intended to allow coral regeneration as well as to enhance awareness for the need to conserve coral reefs. Another Economy reported that it has decreed 12 MPAs and has management programs for these MPA that include specific guidelines. Amended regulation to strengthen control over tourism activities in MPAs was reported by one Economy, where non-anchor zones have been designated. Additionally, this Economy stated that destructive fishing practices are prohibited by law. This was said to have been supported by enhanced enforcement actions and regular cleanup campaigns to remove underwater marine debris in MPAs. Another Economy reported that it conducts annual programs to raise awareness on coral reef conservation, "...such as coral reef clean-up, a crown of thorns culling program, and marine education to promote awareness to all stakeholders and enforcement [officers]". Beach cleaning programs were cited by an Economy that also claims to control marine debris, while another Economy said that it promotes public awareness on the impacts of destructive fishing practices and the dangers of using explosives and cyanide.

A developed Economy declared that it practices world-best practice in coral reef management, and indicated a bio-regional marine initiative as an example of world's best practice. Additionally, this Economy has concluded an assessment of vulnerability to climate change for one large coral reef system and reported that a plan of action to minimise the impacts on coastal communities and reef-based industries has also been completed. Following the plan was the development of a climate change adaptation strategy for the coral reef system. This Economy also identified a number of challenges, which include: promoting the understanding of links between coastal activities and the resilience of coastal systems to threats such as climate change or tsunami; enhancing coastal community readiness to avoid the impacts of climate change including sea-level rise, storm activity, and coral degradation; and promoting and supporting efforts to assess the vulnerability of coastal systems, communities and development activities, and preparation of adaptation plans.

Another Economy reported the establishment of a fisheries tribunal. Further detail on the scope and mandate of the tribunal was not provided. One Economy indicated that its only coral reef has been an MPA for nearly 30 years. Three Economies that had indicated their level of support did not provide any elaboration.

d) A developed Economy re-stated here the response it provided to part (c) of this question where it stated that it practices ongoing world-best practice in coral reef management by indicating a bio-regional marine initiative as an example.

A number of activities were reported by another Economy including: holding annual training workshops and seminars under Reef Check; arranging school talks and fieldtrips; launching a certification course for diving instructors; promoting general public awareness through lectures, seminars, guided tours, booklets, leaflets, posters, web-based materials etc; and finally organising a large-scale photo and video competition in 2006 to promote marine conservation. One developed Economy reported that it has undertaken outreach programs for marine conservation and education at various sites through a university-based network focusing on coastal resource use and marine conservation.

An Economy reported the implementation of training programs specifically for mangrove, coral reef and seagrass conservation, as well as the establishment of a volunteer group of local communities for coastal and marine conservation initiatives. Another Economy cited the provision of education programs at the marine-park visitor centres aimed at stakeholders



which include local communities, fishers, resort operators, dive operators and boat operators. However, the effectiveness of these programs was not discussed. One Economy reported that a program that focuses on education in coral reef conservation has been implemented.

An emerging Economy stated that it is planning to develop a Reef Check program that promotes economic benefits obtainable from marine conservation initiatives to enhance local interest in conservation. Another Economy reported that it adopted the Seagrass Watch International program, which is almost entirely run by volunteers with some funding and logistics support provided by the Economy. Additionally, this Economy stated that the coral reef monitoring program is also entirely run by volunteers, however, this program is not linked to ICRI or ICRAN.

An ICM Summit and MPA Congress were conducted by an Economy which also assisted in the selection of best managed reefs. Three Economies stated that they 'promote' public awareness or education through mass media, educational visits or published material. None of these Economies provided further explanation of these generic actions.

An impediment reported by an Economy was that its coral ecosystems and benthic ecosystems are of soft corals in deep cold waters, which are not within management policies. Therefore, at present, no protection is afforded to these ecosystems.

One emerging Economy stated that "all MPAs have environmental education programs at various stages". A developed Economy provided an invalid elaboration, while another Economy did not elaborate on the rated response provided.

e) An Economy reported support and participation in the East Asian-Australasian Flyway Partnership through the ASEAN Heritage Park Programme (with one Heritage Park), which aims to enhance awareness, enjoyment and conservation of ASEAN's natural heritage, including wetlands. This Economy also stated that it contributes "to the conservation of migratory shorebirds and their wetland habitat through the East Asian-Australasian Flyway Partnership.

Another Economy stated support for the protection of wetlands through involvement in the East Asian-Australasian Flyway Partnership and the RAMSAR Convention. One member Economy reported its plans to designate 10% of mudflats as protected areas. It has already designated six coastal wetlands as Wetland Protected Areas (WPA), and is promoting some of these for inclusion on the RAMSAR list. In addition it will be organising events to promote protection of wetlands through an education and monitoring program. Another Economy cited that it has established several International Wetland RAMSAR Sites as well as a wetland conservation program. One Economy stated that it has joined the RAMSAR Convention to protect its wetlands, and reported that implementation through protecting wetland habitats and assistance from non-governmental organisations has been carried out. Additionally, this Economy cited that its fishing communities based in or near wetlands draw many of their daily needs from these environments and that these activities occur in harmony with the wetland environment both onshore and in the mountains.

Another Economy stated that it has 64 wetlands registered for the RAMSAR Convention wetland list, and has almost completed a national wetlands inventory. These efforts were reported to have been supported also through legislative amendments that allow provision for the protection of mangrove and their habitat. Another developed Economy reported that it is a signatory to: a "bilateral migratory bird agreement" with three other Economies. This Economy reported that it has 65 RAMSAR listed wetlands, which are protected through federal legislation. Additional efforts reported include the development of RAMSAR wetland guidelines to improve the management of RAMSAR sites; and promotion of wetland awareness and education where an estimated \$877 million has been set aside over the last few years for various programs and projects on wetland conservation. These investments have been reported to be enhanced by a national plan for water security, which will increase water-use efficiency. The primary challenge to these programs was said to come from droughts, which have changed the ecological character of more than one RAMSAR wetland site.



Wetlands in one Economy are protected through fish habitat protection programs supported by legislation. Associated projects include the restoration of wetlands and removal of small hydropower dams.

One Economy reported opening a wetland park in 2006 that attracts more than 1.2 million annual visitors. The wetland park was said to be a hub for conservation education, and has organised over 2,000 guided tours and educational activities for 80,000 school children.

A respondent Economy that supports international efforts noted a lack of effort on wetlands. Another stated that they have produced a report on coastal/marine ecosystems and bio-indicators for national use. Two Economies did not provide elaboration when ranking their efforts.

Regional Initiatives

a) A member Economy indicated that it had supported ICRI through the COREMAP Project.

b) One Economy reported being part of the Mesoamerican Reef Alliance, which is part of ICRAN. A developed Economy reported providing support through coordinating arrangements and close ties between ICRI and ICRAN. Another developed Economy reported successes through "...projects undertaken and technical expertise shared". One Economy reported the provision of "...\$50,000 to the International Tropical Marine Ecosystem Management Symposium (ITMEMS) held by ICRAN in 2006.

c) A respondent Economy reported the success of Northwest Atlantic Fisheries Organisation (NAFO) agreeing to a proposal to establish a Coral Protection Zone which will be closed to bottom-fishing for five years to enable data collection towards establishing a long-term strategy. Another Economy reported financial support and development of several projects in the Pacific and East Asia, focused upon destructive fishing reform, coral reef conservation, and MPA network enhancement in the coral triangle region.

d) None reported.

e) The response from an Economy which is a signatory to the RAMSAR Convention indicated that it works collaboratively with Pacific Island States under the Convention on capacity building, improving environmental governance, and wetland protection and management.

Relevant International Initiatives

a) One Economy reported that it provided a very high level of administrative support to the ICRI, including a symposium in 2007. Additionally, this Economy indicated the establishment of a steering committee, which is preparing positive activities to promote coral reef conservation.

Another Economy said that it provides a high level of political support for ICRI and has successfully provided activities and shared technical expertise, and another reported regular engagement in ICRI meetings. High support for the 2006 ITMEMS coordinated through the ICRI was noted by two Economies. Two other Economies indicated contributions towards planning the '2008 International Year of the Reef'.

b) None provided.

c) None provided.

d) None provided.

e) None reported apart from Economies who indicated actions relevant to the RAMSAR Convention above.

**Discussion of Organisational Perspective (from the Survey of Organisations)**

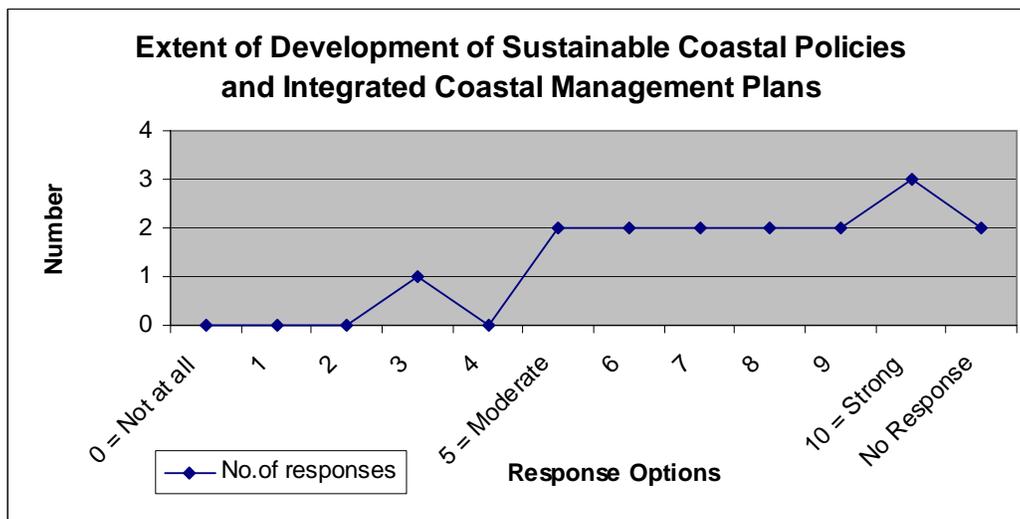
Organisations reported either direct or indirect support for ICRI and ICRAN, and reported support and initiatives towards the reduction of marine debris and destructive fishing. The observed limiting reported was the geographic spread of activities that limited organisational participation. Organisational support to improve public education and public understanding of the importance of coral reefs, Seagrass beds and mangrove habitat was reported to occur mainly on a regional basis, although strong emphasis at the domestic level was also cited. Programs related to charismatic mega-fauna were however often cited also by organisations.

Section Summary

Participating Economies showed good awareness of ICRI and ICRAN and generally strong support of these organisations. Almost all Economies cited domestic initiatives to reduce impacts on coral reefs and/or mangroves. Importantly, the RAMSAR Convention was frequently recognised as an important international instrument underpinning domestic initiatives to identify and protect wetlands.



Question 28	Relates to BPA Action: I.b.xvii
To what extent has your Economy developed sustainable coastal policies and integrated coastal management plans?	Encourage Member Economies to develop their own sustainable coastal policies and integrated coastal management plans, to accommodate the conservation and protection of vulnerable areas.



Interpretation of Quantitative Data

Thirteen Economies reported moderate to strong progress with regard to the development of sustainable coastal policies and integrated coastal management plans. However, one Economy described progress as low, and two others declined to respond to the question, thus highlighting a possible need for continued capacity building in this area.

Domestic Initiatives

One developed Economy stated that it is experiencing significant pressures in the coastal zone from: population growth and coastal development, impacts of climate change, poor coastal water quality including from acid sulphate soils and biodiversity decline. In response this Economy has developed a framework for a national cooperative approach to integrated coastal zone management, a ten-year framework focusing on priority coastal issues, which has resulted in an implementation plan. Another developed Economy reported that the greatest challenge is the "...pressures of unsustainable development".

Primary mechanisms for coastal management as reported in the response of one Economy are "...Regional Coastal Plans..." mandated under legislation. These plans deal with most activities, except fisheries and MPAs; however, management of rising environmental pressures on the coastal environment continues to pose a challenge. Another Economy indicated the development of a new legislation in 2007 that promotes integrated coastal management.

One developed Economy reported the following range of broad and specific integrated management mechanisms: nineteen eco-regions have been identified "...which serve as a reference base for ecosystem-based ocean management decisions within the eco-regions; integrated management processes have been initiated for five large ocean management areas (LOMA); scientific research is being done to develop management objectives with stakeholders, including the identification of ecologically and biologically sensitive areas (EBSA); and ecosystem overview reports were produced for five LOMAs describing status and trends of biological and physical ecosystem aspects. Most progress has been on EBSA research and development of EBSA criteria (e.g. uniqueness, aggregation, etc); successful



use of GIS, workshops and Delphi approach to identify EBSA; and specific coastal management plans. A Coastal Management Centre of Expertise has been announced.

An Economy reported zoning coastal areas for fish farming with good water exchange and limited multiple coastal use. Additionally, this Economy reported the adoption of an administrative process that requires biodiversity impact assessment for most coastal/marine development projects or large scale terrestrial developments and the implementation of environmental management and monitoring during development phase. Another Economy indicated launching a sustainability assessment system "...to ensure the integration of sustainability considerations into Government's decision-making process, especially for major..." projects.

One emerging Economy reported an Executive Order signed in 2006 "...Establishing Integrated Coastal Management as a National Strategy". Another emerging Economy stated that it now has a national environmental policy (as of 2006) for the sustainable development of the coastal/marine environment. It was reported that this policy has led to a national strategy for ecological development, which has given rise to proposals to set up an inter-departmental commission for sustainable development, which is now underway.

An emerging Economy cited the development of an "...Integrated Coastal and Oceans Management concept (ICOM)". Additionally, this Economy has initiated strategic plan for coastal management in some areas. Another emerging Economy reported that it is developing several integrated coastal resource management policies, for example, coral reefs, seagrass beds and mangroves.

One Economy reported that published coastal management plans have been used by relevant agencies. Two other Economies did not provide details on actions or initiatives.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

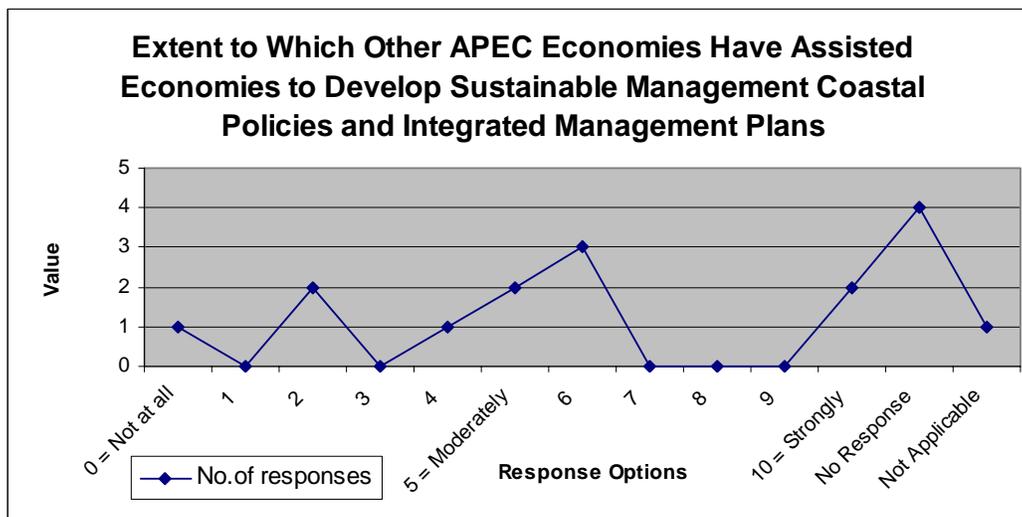
Although less than half of the respondent organisations indicated activities in relation to this BPA Action area, many of the actions, programs and initiatives cited, were reported to directly provide assistance to APEC Economies towards developing sustainable coastal policies or ICM. In some instances, this assistance was stated to have resulted in legislative outcomes within Economies.

Section Summary

Most Economies have indicated that they recognize a need for integrated management of coastal and marine areas. Developed and emerging Economies appear to be leading in the challenge of building awareness to develop new ICM policies and plans. Several Economies cite new or revised legislations as an important tool to implement ICM.



Question 29	Relates to BPA Action: I.b.xvii
To what extent do you feel other APEC Economies have encouraged your Economy's development of sustainable management coastal policies and integrated management plans?	Encourage Member Economies to develop their own sustainable coastal policies and integrated coastal management plans, to accommodate the conservation and protection of vulnerable areas.



Interpretation of Quantitative Data

More than half of the respondent Economies reported that they have received weak encouragement from other APEC Economies to develop sustainable coastal policies and integrated coastal management plans to accommodate the conservation and protection of vulnerable areas. One economy declared that it has received no encouragement at all. However, six Economies maintain that such encouragement from fellow APEC Economies has been strong. Qualitative data helps to explain these seemingly contradictory opinions. To an extent, encouragement to develop sustainable coastal policies and ICM plans has been received through inter-governmental fora rather than directly from "other APEC Economies". Also, one developed Economy explained that it neither requires nor expects such encouragement.

Domestic Initiatives

One Economy reported that it has "...been encouraged through the APEC and other international fora", and "...promotes the understanding and application of the theories and practices of sustainable development". Another Economy reported that there have been several initiatives with "APEC Members such as, comparative studies and lessons learnt on integrated coastal and ocean management. However, the intensity of such initiatives is still minimal".

Another Economy reported that it has had "...good cooperation..." from one developed Economy and the "...World Forum of Oceans, Coasts and Island States" under Agenda 21.

One developed Economy stated that it has a "...strong domestic focus on sustainable environmental management..." and "...do not require or expect encouragement from other Economies to develop sustainable/integrated management tools".

Seven Economies did not provide detail to support their ranked quantitative response, and two neither responded nor provided elaboration. Response from an Economy stated that this question was not applicable from a fisheries point of view.

**Regional Initiatives**

One developed Economy stated, "...that other APEC Economies value the experience of our Economy in this area and encourage us to share lessons learnt and undertake joint projects".

Relevant International Initiatives

None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

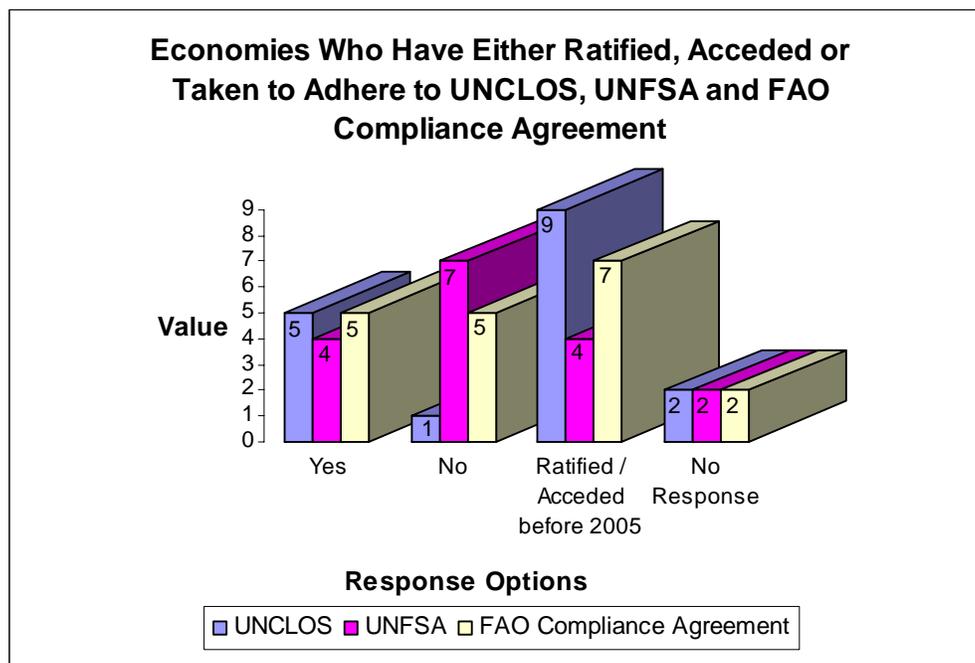
None reported.

Section Summary

The development of ICM policies and plans is primarily a domestic activity. Although this BPA Item calls for member Economies to be encouraged to develop sustainable coastal policies and ICM plans, the action agent is not specified. Accordingly, no category of Economy or other organisation can be seen to be accountable for offering "such" encouragement. More developed Economies and those that are sensitive on the question of national pride also appear disinclined to accept outside attention to their efforts in this area. Therefore, coastal policy and ICM is likely to remain a field dominated by domestic interests and initiatives, as reflected in the response to this question.



Question 30	Relates to BPA Action: I.c.i
Since September 2005, has your Economy ratified, acceded, or otherwise undertaken to adhere to: a) UNCLOS? b) UNFSA? c) FAO Compliance Agreement?	Increase the number of APEC Economies that ratify, or adhere to, UNCLOS, UNFSA, FAO Compliance Agreement, and effectively implement provisions domestically and in RFMOs in which they are a member.



Note: Some Economies that have Ratified or Acceded Prior to 2005 have also undertaken adherence actions after September 2005.

Interpretation of Quantitative Data

A significant number of APEC Economies ratified or indicated adherence to UNCLOS, UNFSA, and FAO Compliance Agreement before September 2005. Responses to the question show that among the three international agreements, UNCLOS is widely adhered to by APEC Economies, while about a third of Economies have yet to ratify or accede to the UNFSA and FAO Compliance Agreement.

Domestic Initiatives

Two Economies have disclosed plans to accede to the international agreements. One Economy reported that it is considering proposals to accede to the UNCLOS while emphasizing that it has a standing policy to act in a manner consistent with the provisions of the Convention. Another Economy reported that it is going to accede to the UNFSA in early 2008.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

**Discussion of Organisational Perspectives (from the Survey of Organisations)**

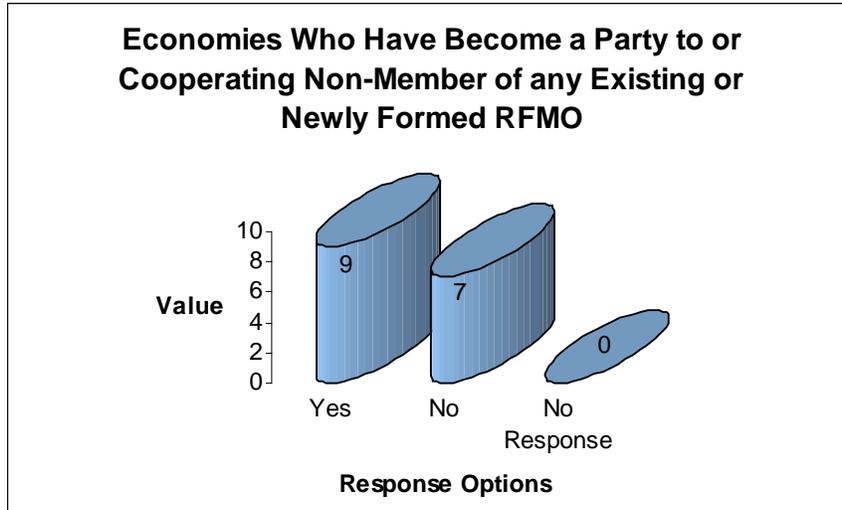
None reported.

Section Summary

The survey responses generally indicate the level of accession and ratification of international fisheries-related agreements by APEC Economies. However, no elaboration was provided by the respondents on measures that have been undertaken to implement such agreements, nor were there explanations as to why some Economies have not acceded to UNCLOS, UNFSA, and the FAO Compliance Agreement. The survey responses therefore suggest scope for wider participation in international agreements by APEC Economies, or better understanding of the obstacles to such participation.



Question 31	Relates to BPA Action: I.c.ii
Since September 2005, has your Economy become a party to, or cooperating non-member of, any existing or newly formed RFMO?	Increase the number of APEC Economies that are a party to, or a cooperating non-member of, all relevant RFMOs, and cooperate in establishing new RFMOs, where gaps exist.



Interpretation of Quantitative Data
 The survey illustrates that over half of the respondent Economies have become parties or cooperating non-members to existing or newly-formed RFMOs since September 2005.

Domestic Initiatives
 A number of APEC Economies have expressed their commitment to ratify new regional agreements and participate in the establishment of new RFMOs. Three APEC Economies have become members of IOTC. One Economy has signed the Southern Indian Ocean Fisheries Agreement while another is considering ratification of the agreement. Five Economies are actively involved in negotiations to establish the South Pacific RFMO. Two Economies have become members of the Western and Central Pacific Fisheries Commission since September 2005 and are considering joining other relevant RFMOs. Another Economy is in the process of becoming a member of the WCPFC and CCSBT.

Regional Initiatives
 A number of APEC Economies are in the process of negotiating the establishment of new RFMOs in the South Pacific and North Pacific. At the bilateral level, one respondent indicated that it has held bilateral talks with another Economy on fisheries matters in the South China Sea.

Relevant International Initiatives
 Some responses to both Economy and organisation surveys pointed out existing efforts to manage fisheries resources in the Pacific. One of these efforts has been the establishment of the WCPFC, which covers tuna resources in the Western and Central Pacific, excluding southern bluefin tuna. The establishment of the South Pacific RFMO is being explored to complement the work of the WCPFC and cover non-tuna resources on the high seas of the Southern Pacific.



Discussion of Organisational Perspectives (from the Survey of Organisations)

Using organisational awareness as a measure of implementation resulted in positive responses showing that respondents reported that the BPA Action area is addressed outside of the APEC framework. Most reported awareness was related to efforts to establish a new non-tuna high-sea RFMO in the South Pacific. Interestingly, one IGO also observed that other instruments or organisational work programs may result in alternative inter-regional fisheries management mechanisms as alternatives to RFMOs. No responding RFMO indicated knowledge of any new ratification of agreements or additional cooperating non-members. However, two Organisations did provide an indication of alternative areas of relevance to this BPA Action area. The first reported progress by APEC Economies in ratifying the new instrument of RFMO mandate, and the second indicated areas where fisheries management could benefit from further implementation.

Discussion of Organisational Perspective (from the Survey of Organisations)

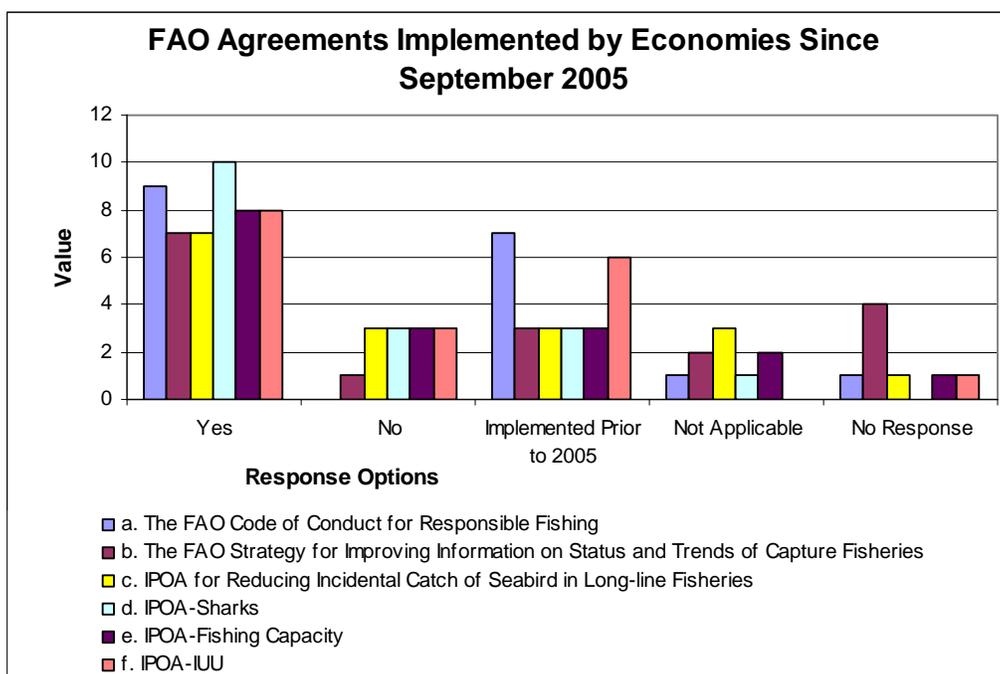
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Section Summary

The survey suggests increasing participation by APEC Economies in relevant RFMOs. Furthermore, the survey has identified endeavours by Economies to address gaps in fisheries governance by establishing new regional organisations to manage fisheries in areas where no measures currently exist.



Question 32	Relates to BPA Action: I.c.iii
<p>Please indicate which of the following FAO agreements have been implemented by your Economy since September 2005:</p> <p>a) The FAO Code of Conduct for Responsible Fishing;</p> <p>b) The FAO Strategy for Improving Information on Status and Trends of Capture Fisheries;</p> <p>c) International Plan of Action for Reducing Incidental Catch of Seabirds in Long-line Fisheries;</p> <p>d) International Plan of Action for the Conservation and Management of Sharks;</p> <p>e) International Plan of Action for the Management of Fishing Capacity;</p> <p>f) International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing</p>	<p>Increase the number of APEC Economies that implement the FAO Code of Conduct for Responsible Fisheries, Strategy for Status and Trends, and International Plans of Action on Seabirds, Sharks, Fishing Capacity, and Illegal, Unreported and Unregulated (IUU) fishing.</p>



Some Economies who have implemented Prior to 2005 have undertaken further actions after September 2005.

Interpretation of Quantitative Data

The results of the survey demonstrate a relatively high level of adoption and implementation of some of the non-binding fisheries instruments. In general, more than half of the APEC Economies have adopted measures to implement the FAO Code of Conduct for Responsible Fisheries and its associated IPOAs, and the FAO Strategy for Improving Information on the Status and Trends of Capture Fisheries.

Most of the respondent Economies indicated that they implemented the FAO Code of Conduct before September 2005. Only one Economy reported that the FAO Code of Conduct



is not applicable because that Economy is not a member of the FAO. Another Economy stated that it implements the FAO Code of Conduct through the Regional Guidelines for Responsible Fisheries in Southeast Asia.

With respect to the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries, respondent APEC Economies generally signified their implementation of the FAO Strategy. Some of these Economies implemented this Strategy prior to September 2005. One Economy observed that it has programs that complement the Strategy, while another declared that it does not implement the Strategy at all. There are also a number of Economies that declined to answer this particular survey question.

There is relatively wide application of the International Plans of Action across the APEC Region. Among the various IPOAs, the IPOA-Sharks has been adopted by the greatest number of Economies, followed by the IPOA-Capacity and IPOA-IUU. A number of APEC Economies have stated that the reason for not implementing the IPOA-Seabirds is that the issue is not relevant to them, either because they are not members of FAO or their fisheries do not have seabirds as by-catch.

Domestic Initiatives

Implementation of the FAO Code of Conduct for Responsible Fisheries

Eight APEC Economies have reported that the FAO Code of Conduct has been adopted in domestic policies and legislation. Some of the measures adopted by these Economies to incorporate the Code in their laws and policies are:

- continuous adoption of fisheries management plans to cover most national fisheries;
- implementation of ecosystem based fisheries management (EBFM) that considers the impact of fisheries on the broader marine environment, including the impact of fishing on target species as well as by-catch species, threatened, endangered and protected species, habitats, and communities;
- undertaking Ecological Risk Assessments (ERAs) for major fisheries that assess both the direct and indirect risks that fishing poses to the ecological sustainability of the marine environment;
- involvement of all relevant organisations and the fishing industry in the development of national guidelines for responsible fishing;
- establishment of the optimum level of effort for capture fisheries;
- introduction of environmentally-friendly fishing gears;
- active participation in the international fisheries fora to realize sustainable fisheries based on the best scientific information available;
- translation of the FAO Code of Conduct into national languages and distribution of the translated Code to relevant stakeholders;
- application of management principles such as the precautionary approach;
- adoption of measures such as reduction of overcapacity for trawlers in the near shore zone, registration of all licensed fishing vessels, installation of turtle excluder devices on trawlers, installation of VMS transmitters, creation of fisheries management zones, establishment of quotas, adoption of minimum size for capturing species, minimum size of net mesh, fishing areas, prohibition during egg-laying, and short prohibition terms for juvenile fish protection; and
- periodic reporting of the implementation of the FAO Code of Conduct to FAO.

Implementation of the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries

Some of the reported national initiatives to implement the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries are:

- collection and analyses of fishery data from logbooks, catch returns, quota monitoring, sampling, surveys, observers and a range of other sources;
- membership in RFMOs and fulfilment of all RFMO requirements relating to the collection and provision of data;
- publication of a periodic (monthly or annual) record of fishing effort based on fishing gears, species landed on each fisheries management zone, as well other relevant data on marine environment and climate change;



- implementation of stock assessments and collection of data on coastal or small scale and commercial and offshore fisheries;
- improvement of fisheries statistical system;
- involvement in capacity building projects on fisheries data collection with neighbouring States in the region; and
- participation in FAO-sponsored programs on fisheries data collection.

One Economy emphasised that although it does not implement the FAO Strategy, it has established programmes and initiatives that complement it, including the improvement of data collection through the use of e-logs, implementation of VMS, improvement of IT systems that capture fisheries data, and creation of a statistical renewal steering committee that is responsible for providing recommendations and guidelines to improve its fisheries statistical systems. These efforts are undertaken to improve knowledge and continuously gather more accurate and timely information necessary for sustainable fisheries management.

Implementation of the IPOA-Seabirds

Seven Economies have adopted their respective NPOA-Seabirds which require the application of mitigation measures to reduce the incidental catch of seabirds in long-line fisheries. In addition to the NPOA, one Economy has also undertaken a number of measures to address the problem. One of these measures is the development of a technical report that assessed the impacts of by-catch on seabird populations and outlined mitigation efforts to reduce the incidental catch of seabirds. Other measures include:

- the continuous examination of levels of incidental seabird catch mortality in long-line fishery;
- development and implementation of a pelagic seabird monitoring program;
- reporting of by-catch in logbooks;
- identification and assessment of new fishing techniques and technologies that may mitigate the impact of fisheries practices on habitat and other species;
- outreach programs to inform fishers further of the issue and some of the simple and cost effective ways that may voluntarily reduce impact on seabird populations;
- cooperation on by-catch issues with international and regional organisations such as the International Pacific Halibut Commission, WCPFC, and ICCAT; and
- continuous cooperation with neighbouring States to exchange information and develop joint efforts in matters of mutual jurisdiction.

One Economy is in the process of reviewing its NPOA-Seabirds. It proposes a range of voluntary and regulatory management measures for both trawl and long-line fisheries. Its NPOA also requires fisheries with known seabird interactions to develop Codes of Practice which should include a by-catch limit that reduces over time, a description of mitigation measures that will be used, and reporting and compliance monitoring and education programmes. If Codes of Practice are not adopted in a satisfactory and timely manner, the Economy aims to replace such Code with regulatory measures. Another Economy emphasised that an agreement between two relevant national organisations has assisted in improving the conservation status of seabirds in its waters.

An Economy stated that it is in the process of developing a NPOA-Seabirds. However, it has already put in place a threat abatement plan for the incidental catch of seabirds during oceanic long-line fishing, whereby a range of measures are provided to minimise the by-catch of seabirds. Four Economies stated that they do not implement the IPOA-Seabirds because the issue is not that relevant for them.

Implementation of IPOA-Sharks

Three Economies implemented their NPOA-Sharks prior to September 2005. One of them is now in the process of reviewing the national plan. The survey also establishes that ten Economies adopted their respective NPOA-Sharks after September 2005. In addition, these Economies have adopted a number of legislative measures that are relevant to managing and maintaining the long-term sustainability of shark populations and fisheries. Some of principles adopted to achieve this objective are ecological sustainability, integrated fisheries management, and the precautionary approach. Measures implemented to manage shark fisheries include dockside monitoring, at-sea observer coverage, quota monitoring systems, electronic vessel monitoring system, research on shark fisheries, ban of shark finning, capture



of whale shark fishing, regulation in sharks trade, and exchange of information and expertise on the matter.

One Economy expressed a commitment to work with other Contracting Parties within relevant RFMOs to:

- encourage Contracting Parties that have not done so to implement the FAO IPOA-Sharks through national plans of action;
- promote the adoption of an ecosystem approach and the precautionary approach to fisheries management within RFMOs;
- encourage improved data collection and information sharing within and among RFMOs regarding commercial catches and incidental by-catch of sharks; and
- promote the review and implementation of measures to reduce shark by-catch in directed fisheries managed by the RFMOs.

One Economy stated that it is in the process of developing its NPOA-Sharks and conducts joint research with a neighbouring Economy on shark fisheries. Two Economies have already drafted NPOA-Sharks which are in the process of public consultation. One of the measures adopted under the draft NPOAs is the registration of data related to landings and fishing effort provided by artisanal fisheries. Another Economy has also reported that it has convened a workshop to develop its NPOA-Sharks. On the other hand, an Economy stated that it does not implement the IPOA-Sharks, while two other Economies provided that the IPOA-Sharks is not relevant for them.

Implementation of IPOA-Capacity

Three Economies implemented the IPOA-Capacity prior to September 2005. One of these Economies has adopted measures such as: the requirement to fit Integrated Computer Vessel Monitoring Systems (ICVMS) on vessels fishing on the high seas; a Fisheries Structural Adjustment which includes a fishing concession buyout focused on reducing fishing capacity; and a Fishing Communities Programme that is aimed at generating new economic and employment opportunities in vulnerable regional ports affected by reduced fishing activity. One Economy has decommissioned 20 per cent of its large scale tuna long-liners and has supported the establishment of the Organisation for the Promotion of Responsible Tuna Fisheries in order to develop mechanisms to contain the increase of capacity in large-scale tuna long-liners across the globe. Another Economy has implemented two phases of vessel reduction programs in order to reduce large-scale tuna long line vessels. This initiative was said also to involve the scrapping of such vessels and strict regulations on the construction and importation of vessels.

Three Economies stated that they implement the IPOA-Capacity, but did not elaborate whether they adopted this IPOA prior to or after the adoption of the BPA. These Economies highlighted a number of relevant measures to address issues related to fishing capacity such as:

- the adoption of an NPOA-Capacity;
- ongoing process to develop a national master plan for fisheries management of capture fisheries;
- monitoring and control of fishing operations on the high seas;
- conduct of regional consultations to reduce fishing capacity of trawlers and push-netters in important fishing areas and convening of senior officials to establish action plans for fishing capacity reduction;
- implementation of exit programs for fishermen who desire to find alternative sources of livelihood; and
- implementation of other measures such as temporary closed areas and seasons for fishing.

Two Economies are in the process of drafting their NPOA-Capacity, while two others have stated that they do not implement the IPOA-Capacity. One Economy stated that even though it has not adopted a formal NPOA-Capacity, it has developed guidelines for capacity management that address critical elements of the IPOA-Capacity. In addition to input control measures such as gear and area restrictions, this Economy reported that it limits entry to fisheries and implements an Individual Quota and Enterprise Allocation. Another Economy has also reported that it has adopted a number of measures to manage its fishing capacity



outside the framework of the IPOA-Capacity. Such measures include the application of a quota management system, which does not use capacity constraints but relies upon output controls to ensure catches are kept within sustainable limits.

Implementation of IPOA-IUU

Six respondent Economies reported that they implemented the IPOA-IUU before September 2005. Some of the measures adopted by these Economies to implement the IPOA-IUU and address IUU fishing are:

- provision of additional budget to increase enforcement capacity;
- improvement of coordination and cooperation in operational activities to deter illegal fishing;
- introduction of amendments to legislation to include significant custodial penalties for foreign fishing offences;
- conduct of joint patrols with neighbouring States;
- participation in international and regional efforts to address IUU fishing;
- maintenance of a cadre of professional, well-trained and well-equipped fishery officers with authority to inspect, search, seize and arrest fishery violators;
- implementation of fisheries laws, including regulations of fishing efforts and promoting rights-based fisheries to replace open access regimes;
- implementation of observer programmes and dockside monitoring programmes;
- improvement of MCS systems, involving local communities;
- involvement in the International MCS Network
- implementation of a registration and licensing system for fisheries
- implementation of port State control measures such as the requirement to provide reasonable advanced notice and information prior to entry into port, undergo port inspections, and the application of port enforcement measures against IUU vessels such as the prohibition of landing and transshipment;
- implementation of boarding and inspection schemes;
- application of rules to prevent nationals from engaging in IUU fishing;
- cooperation with neighbouring States to address IUU fishing;
- decommissioning of vessels engaged in IUU fishing;
- collection of fisheries information from local and foreign fishing vessels; and
- certification of fish and fishery products for trade.

Two Economies have reported that they are in the process of adopting an NPOA-IUU while two others stated that they do not implement the IPOA-IUU but have been monitoring IUU fishing by foreign fishing vessels.

Regional Initiatives

There are a number of regional initiatives relevant to the implementation of non-binding fisheries instruments, as provided by the BPA. The respondent Economies mentioned implementation of the Regional Guidelines for Responsible Fisheries in Southeast Asia. During the BPA Workshop, it was emphasised that these Guidelines are based on the FAO Code of Conduct and are tailored to address the specific fisheries management needs of Southeast Asia.

Three initiatives at the regional level have been identified by APEC Economies to be relevant to implementation of the IPOA-Sharks. One initiative is the Workshop for Diagnosis and Formulation of the National Action Plans for Sharks which was organised by PRODUCE and the Latin-American Organization for Fishing Development (OLDEPESCA), with the technical assistance of FAO in November 2005. This workshop paved the way to discussions on the management of sharks at the national level. A second workshop was held in October 2007 on the Formulation of a Strategy to the Pursuit and Implementation of the National Action Plans for Conservation and Ordering of Sharks. This Workshop aimed to analyze the implementation of national action plans and formulate a strategy for regional implementation. The third regional initiative cited was the study conducted by SEAFDEC on Shark Production, Utilization and Management in the ASEAN Region (2003–2004). The publication arising from this study summarized outcomes from the one-year study on shark catch, local use and trade, the current progress of the development of NPOAs-Sharks in the region, trade in shark products in Malaysia, Singapore and Thailand, and microscopic observation on dermal



denticles of shark fins. Assistance was also provided by SEAFDEC for the collection of information on shark fisheries in Thai waters.

There are two regional initiatives with respect to preventing, eliminating, and deterring IUU fishing which involve APEC Member Economies. The first initiative is the Ministerially-Led Task Force on IUU fishing on the High Seas. The task force developed nine proposals aimed at preventing and deterring illegal fishing. The second initiative is the adoption of the Southeast Asian Regional Plan of Action to Promote Responsible Fishing Practices, Including Combating IUU Fishing in the Region. The actions adopted under the RPOA cover conservation of fisheries resources and their environment, managing fishing capacity, and combating IUU fishing in three areas: the South China Sea, the Arafura-Timor Seas, and the Sulu-Sulawesi Seas (Celebes Sea). One Economy also mentioned that issues on fishing capacity are being addressed by SEAFDEC. APFIC has also elaborated recommendations regarding capacity management.

Relevant International Initiatives

One of the returned organisation surveys cited the UN Train-Sea-Coast course on Responsible Fisheries in the Pacific Islands Region, which benefited a number of APEC Economies. The course aims to train in the use of the FAO Code of Conduct and its associated Technical Guidelines and IPOAs to review fisheries management options and issues, including other instruments and arrangements, and build capacity among fisheries managers, representatives from the private sector and non-government organisations in assessing and implementing fisheries management options.

Another relevant international initiative is the Marine Stewardship Council's fishery certification and assessment process which is based very closely on the FAO Code of Conduct. It operates a traceability certification program called Chain of Custody which is designed to ensure that fish bearing the MSC label have come from certified sources.

Discussion of Organisational Perspectives (from the Survey of Organisations)

One of the organisations stated that while its work is not directly aimed at implementing the FAO Code of Conduct, FAO Strategy, and the IPOAs, it recognizes the need to improve information for fishery ecosystem management purposes, including reporting obligations to relevant RFMOs such as the WCPFC. The WCPFC was reported to have integrated the non-binding fisheries instruments into the work of the Commission.

Discussion of Organisational Perspective (from the Survey of Organisations)

Assistance provided to Economies by respondent organisations to implement fisheries management instruments, mostly occurred at the regional level, followed by domestic actions. The least number of actions occurred at the international level. Some of the more compelling elaboration was not necessarily in relation to what assistance was being provided, but more interesting perhaps was the indication that through a lack of assistance some of these international instruments are not being implemented within a specific sub-group of APEC, as the elaboration by one significant IGO inferred. Overall, organisations reported assistance to APEC Economies to implement FAO Codes of Conduct, Strategies and IPOAs suggesting a significant level of organisational association with these fisheries management and marine conservation instruments, except with regard to a specific group of Economies. One NGO indicated that some areas related to their mandate while others did not. While one RFMO simply indicated that all of these instrument are either implicitly or explicitly integrated into the work of their organisation. Responses indicated that there are a significant number of initiatives and programs aimed at assisting Economies with the implementation of these internationally focused marine resource management instruments.

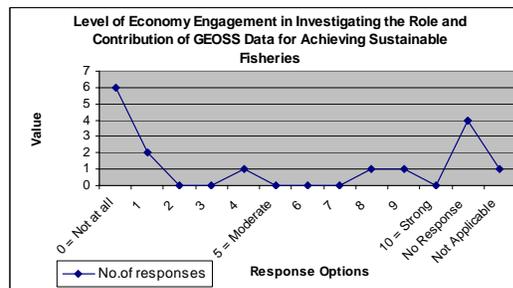
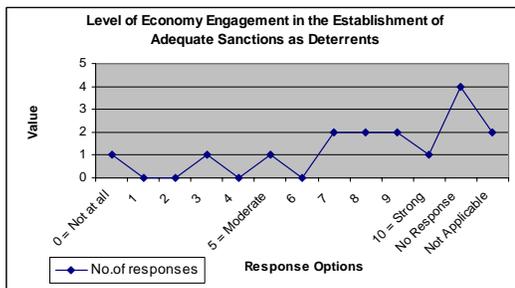
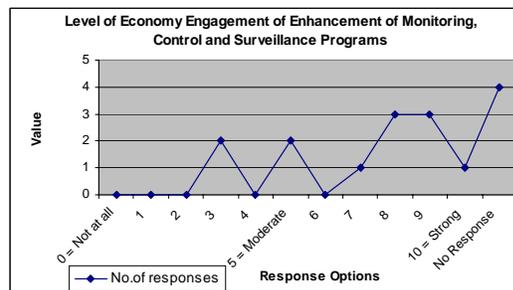
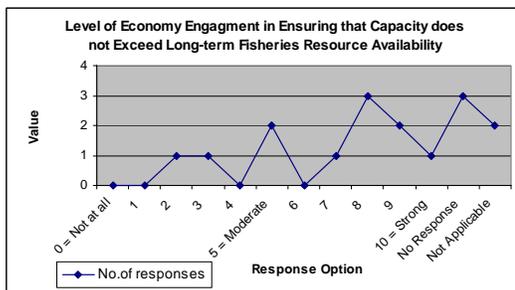
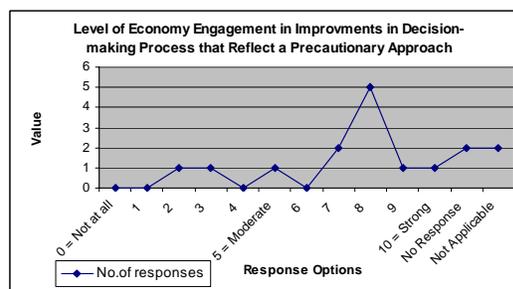
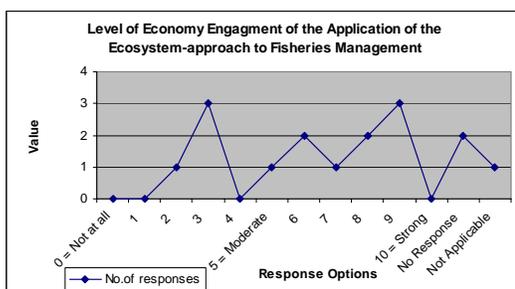
**Section Summary**

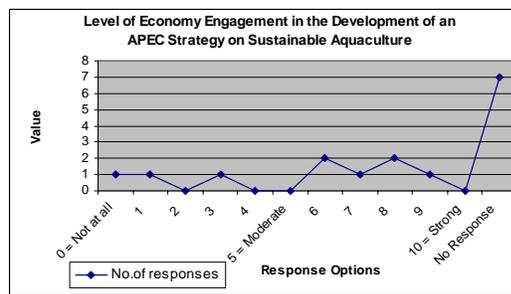
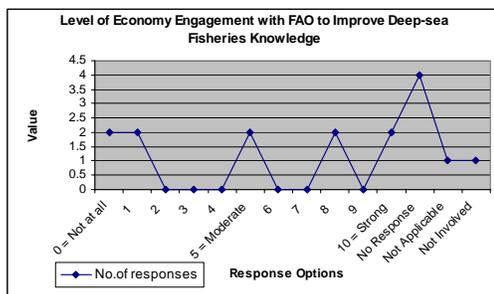
The survey responses show a wide application of the FAO Code of Conduct and its associated IPOAs across the APEC region. The qualitative responses of the Economies also demonstrate that the principles and measures of the FAO Code of Conduct and the IPOAs have been adopted in national fisheries laws and policies, and that most APEC Economies are aware of how such instruments are being implemented at the national and regional levels. On the other hand, the qualitative responses on the survey question regarding implementation of FAO Strategy to Improve Information on the Status and Trends of Capture Fisheries reveal a low level of familiarity on how Economies implement such guidelines.

Notably, the qualitative responses not only provided a discussion of the specific measures being implemented at the national level, but also highlighted impediments to the adoption and implementation of the international instruments and recommendations on how to improve and strengthen such implementation. Two Economies emphasised that impediments to implementation of the FAO Code of Conduct include a lack of adequate financial resources and the complexity of multi-jurisdictional arrangements. General recommendations include encouragement to continue to implement key international fisheries conservation and management agreements and conventions that are fundamental to improving high seas governance; combating illegal fishing; the adoption of additional compliance mechanisms in RFMOs; and improvements to the collection and exchange of information through and between RFMOs. Some respondent Economies also expressed their commitment to cooperate with other APEC Economies in addressing common fisheries problems.



Question 33	Relates to BPA Action: I.c.iv, I.c.vii, I.c.xiv, I.c.xv
<p>Since September 2005, to what level has your Economy engaged in fisheries management reform in relation to the following:</p> <ul style="list-style-type: none"> a) Application of ecosystem-based approach to fisheries management; b) Improving decision-making processes to reflect a precautionary approach; c) Ensuring that capacity does not exceed long-term resource availability; d) Enhancing monitoring, control and surveillance programmes; e) The establishment of adequate sanctions as a deterrent; f) Investigation of the role and contribution of data collected by GEOSS towards achieving sustainable fisheries; g) Cooperating with FAO to improve knowledge of deep-sea fisheries species; h) Involvement in the development of an APEC strategy on sustainable aquaculture. 	<ul style="list-style-type: none"> iv: Engage in fisheries management reform, where appropriate, including through RFMO reform, by advocating the application of an ecosystem approach to fisheries management, improving decision-making processes to reflect a precautionary approach, ensuring capacity does not exceed long-term resource sustainability, enhancing monitoring, control and surveillance (MCS) programmes, and establishing adequate sanctions to achieve deterrence. vii: Investigate the role and contribution of data collected by GEOSS to achieving sustainable fisheries. xiv: Develop an APEC strategy on sustainable aquaculture. xv: Support efforts by APEC Economies to cooperate with FAO to improve knowledge of deep-sea fisheries species.





Interpretation of Quantitative Data

a) Application of the ecosystem-approach to fisheries management

Four economies rated their level of engagement in applying the ecosystem approach to fisheries management as less than moderate, whilst nine others rated theirs as moderate to high. Interestingly, one Economy indicated that the ecosystem approach is 'not applicable'. Elaboration by this Economy revealed that it has only a small fishery of less than 2,000 ton per year.

b) Improving decision-making processes to reflect a precautionary approach

A majority of Economies reported moderate-to-high 'Improvements in Decision-making' to reflect a precautionary approach. Indeed, more than half of the respondent Economies indicated that they have adopted the precautionary approach strongly since September 2005.

c) Ensuring that capacity does not exceed long-term resource availability

Half of the respondent Economies also observed that their level of engagement in fishing capacity control to ensure that it does not exceed fisheries resource availability is moderate to high.

d) Enhancing monitoring, control and surveillance programmes

A majority (10 Economies), reported strong performance in enhancing MCS programs. Two Economies indicated a less than moderate level of engagement in this action.

e) The establishment of adequate sanctions as a deterrent

Seven Economies indicated a 'moderate-to-high' level of performance in establishing adequate sanctions as deterrents. The term 'adequate' however, is very much subjective. One Economy reported 'no action' thus far, and another indicated less than a moderate level of engagement in establishing adequate sanctions.

f) Investigation of the role and contribution of data collected by GEOSS towards achieving sustainable fisheries

Half of the respondent Economies declared that GEOSS data plays either a 'low level' role or makes no contribution at all to achieving sustainable fisheries. However, interestingly, responses to this question reflected either one extreme or the other, i.e. four Economies indicated that the contribution of GEOSS data to sustainable fisheries is 'strong'. There would appear to be a need for improved awareness of GEOSS and its potential as a tool to assist in sustainable fisheries management.

g) Cooperating with FAO to improve knowledge of deep-sea fisheries species

Quantitative responses show that six Economies have a moderate-to-high level of engagement with FAO to improve deep-sea fisheries knowledge. Four Economies reported either no engagement, or a low level of engagement with FAO in this regard.

h) Involvement in the development of an APEC strategy on sustainable aquaculture

Six Economies reported having a moderate to high level of engagement in developing an 'APEC Strategy on Sustainable Aquaculture'. Three Economies reported either no engagement or a low level of engagement in this initiative.



Domestic Initiatives

a) *Application of the ecosystem-approach to fisheries management*

Successes highlighted by one developed Economy include: identifying components that will form the basis of an ecosystem science framework in the context of the multi-functional nature of an ecosystem approach; conducting ecosystem assessments for five Large Ocean Marine Areas (LOMA); and implementing tools such as, MPAs, identification of critical habitat, selective fishing gear, spatial management and reduction of fishing effort, and area closures. This Economy also reported developing a 'national policy on sensitive marine areas' that will guide management and regulation of ocean-based activities that have an impact on sensitive marine areas. The Economy who cited the development of a policy for marine fisheries to address impacts on sensitive benthic areas. Another success identified was the development of a new 'fisheries decision-making process' that introduces policies and tools, including the precautionary approach and ecosystem factors, to provide a mechanism to assess results against objectives and to address gaps.

Challenges reported by this Economy included a limited ability to implement an ecosystem approach due to insufficient data for many aquatic habitat features, or data not being available in a usable format. The issue of data limitations was also reported to be relevant at the international level, where necessary knowledge is still being developed. This Economy further reported that it seeks to tap into any relevant database, and where habitat data does not exist, appropriate collection methods need to be developed. Finally, the Economy noted that limited human and financial resources continue to be a concern as demand currently exceeds capacity worldwide.

Another developed Economy reported the following successes:

- sustainable management of fish-stocks and rebuilding depleted stocks where the OECD has acknowledged that the use of a quota management system avoided stock collapse (noting that this serves as an example to other OECD countries);
- a 'Strategy for Managing the Environmental Effects of Fishing';
- a 'Marine Protected Areas Policy';
- continued development of fisheries standards including, impacts on seabirds, impacts on benthos;
- closure of over 1.2 million square kilometres of EEZ to bottom impact fishing methods (Benthic Protected Areas closure);
- new marine reserves (that are completely no-take zones) and customary fishing areas (limitations on who can fish);
- continued financial investment in research on fish-stocks, fisheries impacts, sedimentation and nutrient enrichment effect on fish habitat; and
- government inter-departmental consultation.

This Economy also reported some continued challenges that include:

- the need to set overall standards in relation to environmental outcomes;
- the need to manage the effects of cumulative activities to ensure overall standards are met;
- incorporating societal values into standards;
- making decisions within a framework of uncertainty (how to implement the precautionary approach effectively);
- a lack of information to support the application of the ecosystem approach to fisheries management;
- creation of cost-effective innovative management of environmental effects (including economic tools); and
- cost-effective monitoring of interventions, given the high cost of assessing changes to biodiversity.

One developed Economy reported that it has implemented the ecosystem approach across all fisheries through 'Ecosystem-based Fisheries Management' (EBFM), which has resulted in the following outcomes:

- 'Ecological Risk Assessment' to determine ecosystem priorities for management or



- research, and for developing response priorities;
- 'Harvest Strategy Development' to ensure target species and by-catch are managed; enhanced fisheries coordination and management;
- by-catch reduction initiatives;
- implementation of spatial management; and communication and extension.

More specifically, this Economy reported that environmental impact assessments of fisheries have been done to design management strategies for commercial fisheries, and that these strategies considered the ecosystem approach and resulted in development of new and innovative research tools. Habitat protection was reported to be achieved through restrictions on harmful activities particularly for fisheries spawning areas and nursery habitat. The Economy stated that scientific challenges have been addressed through collaborative research efforts with research institutes and that ecological models have been produced to understand better the role of fisheries within aquatic ecosystems. This Economy also reported efforts to apply the ecosystem approach to aquaculture through legislation.

In addition to regional initiatives, one emerging Economy reported that it has signed a four-year agreement with a French research institute with the goal to develop research projects and training programs in order to enhance knowledge on the structure and functions of a Large Marine Ecosystem (LME). Through an improved understanding, this Economy aims to identify the links between deep-sea up-welling and ecosystem productivity fluctuations within this large marine ecosystem, where simulation models are being developed to understand complex external and internal oceanic interactions.

A developing Economy stated that it "...needs more supporting scientific information and expertise to study" the ecosystem approach. Another developing Economy cited challenges due to the multi-species and multi-gear nature of its fisheries, and observed that there is insufficient understanding of the ecosystem approach. One emerging Economy reported that it is active in the 'Bay of Bengal Large Marine Ecosystem Programme' (BOBLME) and the 'Sulu-Sulawesi Large Marine Ecosystem'. No further detail was provided; however, the BOBLME members include eight States and the FAO. Establishing MPAs was reported by a developing Economy as a relevant example and an emerging Economy stated a goal to establish fisheries protection areas covering 10% of local waters.

One emerging Economy reported that it focused upon fishing capacity control through the implementation of 'total allowable catches' (TAC) and vessel buyback programs, and that the vessel buyback program had been enhanced by the introduction of an auction system. The economy also indicated that it will continue the vessel buyback program. Additionally, this Economy claimed to be reviewing subsidies.

Four Economies did not provide elaboration, and one Economy indicated that this question was not applicable.

b) Improving decision-making processes to reflect a precautionary approach

The precautionary approach was reported by one emerging Economy to be inherently connected to its goals of sustainable fisheries, which were said to be supported by continuous monitoring of fisheries and research surveys. A developed Economy stated that the precautionary approach is enshrined in fisheries legislation that "greatly informed" the development of Ecological Risk Assessments (ERA), and that the ERAs allocate a higher risk score in the absence of information. Additional reported efforts included the release of case studies and working papers that review the application of the precautionary approach in fisheries management. Finally, this Economy stated that an 'Ecological Sustainable Development Framework' and environmental impact assessments all involve application of the precautionary approach.

Recognition that the precautionary approach is defined differently around the world was reported by one developed Economy, which noted that although fisheries legislation in that Economy has included reference to the precautionary approach for more than a decade, legislation is now being reviewed and amended to reflect the internationally accepted definition and meaning.



A developed Economy stated that it has developed a 'policy paper' to provide a common structure for the application of the precautionary approach across all government departments. Also, a 'Fisheries Policy Review' of one major ocean was said to have called for a comprehensive risk management framework for fisheries decision-making that incorporates the precautionary approach. This Economy also reported that it published a paper on "...elements necessary for a harvest strategy to be consistent with the PA" and through this paper a new 'Fisheries Management Decision-making Framework' was initiated (discussed under part A of this question). The framework was said to be based upon the principle that application of the precaution approach requires increased risk avoidance where there is risk of serious harm and uncertainty is great. The framework was reported to have "...Limit Reference Points (LRP) that defines the stock level below which productivity is sufficiently impaired to cause serious harm, an Upper Stock Reference (USR) below which a management strategy is in place to reduce harvest rates and a Removal Reference that defines the maximum removal rate in each zone". The three reference points identify three stock status zones: Critical, cautious, and healthy. This Economy reported that precautionary approach has been applied to some fisheries, and that initial work focuses on identifying reference points for specific biomasses. In data deficient cases, priority is given to monitoring stock and establishing data to support the identification of reference points that determine management outcomes. Additionally, this Economy reported that any fishery undergoing eco-labelling and certification assessments are required to have reference points, harvest rules and demonstrate precautionary management. The Economy also stated that the development of these reference points and risk management framework have been done with the inclusion of public consultation.

A developing Economy reported that fisheries licences are issued in accordance with a belief that these do not exceed optimum effort levels in each fisheries management zone. While an emerging Economy reported that it applies maximum sustainable yield. Another developing Economy stated that it has insufficient understanding of the concept of the precautionary approach. A moratorium on fishing within a zone out to three nautical miles was reported by another developing Economy. Two Economies indicated that this question was not applicable to them, five did not provide elaboration and two did not provide any answer either to the quantitative or qualitative parts of the question.

c) Ensuring that capacity does not exceed long-term resource availability

One developed Economy reported that in the past it had "...more fishing capacity than was consistent with maximum economic returns and sustainable catches". The Economy undertook a one-off structural adjustment by removing fishing concessions in 2005-06 and that management mechanisms are to be put in place to reduce the likelihood of future over-capitalisation. In addition to the structural adjustment, this Economy has released a 'Fisheries Harvest Strategy Policy' to assure the community that fisheries are being managed for long-term biological sustainability and profitability. Another developed Economy stated that it has sustainable catch limits allocated among commercial, amateur and customary fishers, and that if commercial fishers exceed their allocation, financial penalties are applied.

Comprehensive measures to maintain a balance between fishing capacity and available resources were reported by a developed Economy to have been achieved through 'Integrated Fisheries Management Plans'. A number of strategies were cited by this Economy to limit fishing capacity including: limiting entry to fisheries; control measures on gear and area restrictions; vessel replacement rules; licence requirements for flagged vessels fishing outside of the EEZ, either in another EEZ or international waters, where conditions are applied to licences where relevant; and Individual Quota (IQ) and Enterprise Allocation (EA) which have resulted in fishing capacity reductions of 31% between 1992-2002 (total allowable catch (TAC) is based on scientific advice). Another developed Economy stated that it has a strict policy of control over fishing capacity based on stock status, and that it has also established temporal closure areas and a reporting and data collection system on fishing effort.

An emerging Economy reported that TAC is an important tool used to manage fisheries resources and control fishing capacity. The implementation of vessel buyback programs including enhancements to this initiative through an auction system were also said to have improved capacity. The economy also indicated that it will continue the vessel buyback



program.

One emerging Economy reported that the criteria for decisions on long-term fish resource use are based upon the concept of a maximum allowable catch rather than an "...eco-systemic point of view". A developing Economy indicated that a major issue faced when needing to manage fishing capacity is that it has a very large ocean area that is prone to IUU fishing. Another developing Economy stated that, "a large number of fishing vessels are chasing a few fish" and that "fisheries resources are over-exploited in particular demersal fish...". In another instance, one emerging Economy reported implementation of a moratorium on issuing coastal fishing licences and banning destructive fishing practices. The Economy also stated that data is "...regularly updated to ensure sustainability". Restriction on fishing licences in specific zones was also reported by yet another developing Economy. One emerging Economy reported that it is considering the establishment of a fishing licence system to promote sustainable development and alleviate fishing pressure. Another emerging Economy reported that it has a national fisheries map that provides the fisheries status (an indicator) based on current information for each fishery.

Two Economies indicated that this part of the question was not applicable, another three provided no response and two did not provide elaboration to support the quantitative responses given.

d) Enhancing monitoring, control and surveillance programs

Progress towards receiving six new patrol boats was cited by one developed Economy as a means to improve fisheries surveillance and monitoring within its EEZ. The Economy also stated that the new vessels will be accompanied by aerial surveillance and an inspection regime "...as part of a comprehensive, integrated MCS program". This program is being managed through an inter-agency centre. This Economy stated that the challenge of implementing the enhanced program is one where a transition from shore-based enforcement to a more comprehensive system now to be achieved.

A developed Economy stated that it has a "need for capacity building in this aspect". Another Economy reported that it "...monitors and cracks down on foreign and national fishing vessels' illegal operations in its EEZ and territorial waters". While another developed Economy reported advocating world's best practice in the adoption of effective MCS measures and their implementation in RFMOs, such as VMS, catch documentation schemes, boarding and inspection schemes, and positive and negative vessel lists. This Economy stated that: it has a lead role in the International MCS Network; has been working to encourage neighbouring countries to participate to deter illegal activities; and has provided funding to the network. The Economy reported that it has also expanded coverage of its VMS to the entire fleet under government jurisdiction and formal compliance risk assessments have been conducted for major fisheries on an annual basis to determine high priority risk areas. Additionally, the Economy said it has expanded MCS operations in northern waters by opening up a regional office staffed with fisheries officers who patrol in conjunction with other agencies to detect, apprehend and prosecute illegal foreign fishers, which has resulted in a significant reduction in illegal fishing. Southern water patrols were reported also to occur regularly with authorities of another country under a convention for these waters.

Another developed Economy reported that it has accelerated efforts to modernise and redefine a compliance and enforcement program. Some of the main drivers of the review were reported as: an expanding range of regulatory responsibilities including fisheries, habitat, species at risk, marine security etc; a more complex management regime requiring improved coordination and integration of compliance management; an increasingly challenging legal environment; increased conservation concerns and greater awareness by stakeholders requiring compliance of third parties in compliance and monitoring; and the generation of more data through new technology and the need for enhanced analysis. The Economy stated that under the compliance review it will focus on three areas, integrated risk management, operational planning and budgeting, and performance measures. Under these focus areas, the Economy stated that it will make further advances in integrating new technologies and strategies, enhance integration of VMS and the at-sea observer program, undertake closer monitoring of the dockside monitoring program, and aim for a more strategic



response to activities that have impacts on habitats.

An emerging Economy stated that it "...has made progress inventorying its fishing fleet and operates a program to equip its deep-sea fleet with GPS". Another emerging Economy declared that it has good MCS in place and that a vessel monitoring system is compulsory for deep-sea fishing vessels. It also noted that enforcement practices are upgraded and carried out continuously.

An emerging Economy reported that it has made significant effort to eliminate IUU fishing and that it "...has strengthened control and surveillance domestically". This Economy also reported that it is enhancing the vessel monitoring system (VMS) through increasing the number of fisheries guidance vessels and mandating installation of VMS; and that following RFMO agreement, VMS is being installed on deep-sea vessels. This Economy is also running an international observer program on a trial basis, which it said is likely to expand.

A developing Economy reported monitoring the EEZ although it has no proper training for enforcement staff. An interesting approach to MCS was cited by two developing Economies, which reported that local communities participate in formulating fisheries management and conflict resolution. It also reported that it has established a local MCS network and has applied a simplified MCS system for small-fisheries including conducting training through workshops under a recent project.

Four Economies did not answer the question and three Economies did not provide any elaboration in support of the rating provided.

e) The establishment of adequate sanctions as a deterrent

A developed Economy stated that while its sanctions regime is effective, the regimes lack flexibility relying on the court system and that it is unable to use administrative processes. The Economy reported that it is reviewing legislative processes necessary to provide an effective framework, and under a proposed legislative amendment, tribunals would be established to deal with many violations. Another developed Economy reported that no significant changes have occurred since 2005, and that new legislation which entered into force in 2001 brought significant changes in terms of sanctions including increased penalties, imprisonment and banned fisher provisions. A different approach to sanctions was reported by another developed Economy, where further financial allocations to MCS have been made to a sum of more than USD\$350 Million equivalent, for patrols in northern waters over a four year period. In addition to this sum, a further USD\$29 Million was said to have been allocated to fund the presence of a permanent surveillance vessel in another area within the EEZ. The Economy reported that the measures appear to have had a positive effect "with a substantial drop in the number of illegal foreign fishing vessels sighted and apprehended during 2007". The Economy reported that sightings for the first six months were down 90 percent from the previous year. This Economy also reported a fisheries legislation amendment that came into force in 2007, which has strengthened forfeiture provisions, and surveillance and enforcement powers.

A hindrance to effective sanctions reported by a developing Economy, was that they have difficulty coordinating fisheries and environmental monitoring bodies. Another developing Economy reported that under legislation, the captain is liable to a fine of not more than USD\$743,000 equivalent. An Economy reported that legislation on fisheries violations provided for up to two years imprisonment or a fine of up to USD\$5,000 equivalent. Another Economy reported that current legislation is under revision. Whereas a developing Economy reported that under legislation they have established a fisheries tribunal.

Four Economies did not respond to this part of the question, two Economies stated that it was not applicable, and four Economies did not elaborate to support the ranked quantitative response given.

f) Investigate role and contribution of GEOSS data towards achieving sustainable fisheries

An emerging Economy stated that the Economy has "no expertise/experience [and that] capacity building is needed in this area". A developing Economy reported it does not directly



receive data collected by GEOSS but that it is using remote sensing data to predict fishing grounds and that it disseminates this information.

One Economy stated that this action was not applicable, four Economies did not answer the question, and nine Economies did not explain the rating provided to the quantitative portion of the question.

g) Cooperation with FAO to improve knowledge of deep-sea fisheries species

One developed Economy reported that they do not have deep-sea fisheries. A developing Economy stated that it “provide[s] information to FAO upon request”. Another developing Economy reported that it has undertaken deep-sea fisheries surveys in the Indian Ocean in cooperation with another Economy.

h) Involvement in the development of an APEC strategy on sustainable aquaculture

A developed Economy stated that it supported an APEC project co-sponsored by another Economy to develop an APEC Strategy on Sustainable Aquaculture and that the Economy remains committed to continue to cooperate in its development. While another developed Economy reported that “...there is no formal strategy underway for an APEC Strategy on Sustainable Aquaculture”, and that it is supporting current efforts to establish the Aquaculture Network for the Americas (ANA). Another developed Economy stated that it is not aware of an APEC strategy in sustainable aquaculture; however, the Economy reported that it has developed its own strategy released in 2007 that reflects government commitment to the industry.

An emerging Economy stated that it “...promotes responsible or good aquaculture practices through...” a domestic certification program and that aquaculture is “...regulated and monitored closely to ensure that aquaculture development is ecologically sustainable”.

One developing Economy reported cooperation with an aquaculture research institute based in another Economy to develop sustainable aquaculture in dams and reservoirs. Another developing Economy cited the challenge of biosecurity risk posed by aquaculture, whilst yet another reported that it provided strong support for FWG projects in 2003.

Regional Initiatives

a) Application of the ecosystem-approach to fisheries management

An emerging Economy reported its participation in an international network of scientific support, through participation in EUR-OCEANS Working Group 6 ‘EAF Indicators: A Comparative Approach Across Ecosystems’. The goal of this program was said to be to gather and share indicators and expertise across marine ecosystems and member institutions. One primary outcome of the program is a website to inform the public, and another for experts, on the state of the world’s marine ecosystems due to fishing pressures.

b) Improving decision-making processes to reflect a precautionary approach

None reported.

c) Ensuring that capacity does not exceed long-term resource availability

APEC FWG efforts were cited by one emerging Economy which reported that it has exchanged information and views on fishing capacity in projects and seminars (i.e. Chinese Taipei FWG Meeting, 2006) to facilitate information sharing to build capacity and understanding to encourage a reduction in excessive fishing capacity.

d) Enhancing monitoring, control and surveillance programs

One emerging Economy that reported domestic efforts, also stated that it has been directing efforts regionally to eliminate IUU fishing through meeting with other Economies in the region, and that RFMO provisions are being incorporated into domestic legislation. This Economy also reported that it will soon conclude an agreement on port-State measures with another Economy.



e) The establishment of adequate sanctions as a deterrent

In support of domestic actions, one developed Economy reported regional efforts with a neighbouring Economy through a joint education program to outline the consequences of illegal fishing and to encourage alternative livelihoods.

f) Investigate role and contribution of GEOSS data towards achieving sustainable fisheries

None reported.

g) Cooperation with FAO to improve knowledge of deep-sea fisheries species

Following efforts to improve knowledge on deep-sea fisheries one emerging Economy reported that it has undertaken an initiative to establish a 'Network for Deep Sea Fisheries' to exchange information among APEC Economies.

h) Involvement in the development of an APEC strategy on sustainable aquaculture

None reported.

Relevant International Initiatives

a) Application of the ecosystem-approach to fisheries management

One Economy reported encouraging other States to ratify the UN Fish Stock Agreement to further enable implementation of the precautionary and ecosystem approach for fisheries management.

b) Improving decision-making processes to reflect a precautionary approach

Both international and domestic commitments to implement the precautionary approach in fisheries were reported by a developed Economy, through the UN Agreement on Straddling and Highly Migratory Fish Stock (UNFSA). This Economy also stated that it supported the 2006 UN General Assembly Sustainable Fisheries Resolution that outlines the meaning of sustainable fisheries in relation to vulnerable areas, which also requires decisions to be based upon sound science using a precautionary approach. Additionally, the Economy reported that three proposals submitted by them have been accepted by the Northwest Atlantic Fisheries Organisation (NAFO), one on developing criteria for determining EBSAs, another to curtail fisheries on four seamounts so that scientific information can be gathered, and the third to establish a Coral Protection Zone, closed to bottom-fishing for five years to enable data collection towards establishing a long-term strategy. This Economy also reported that the 2008 NAFO Extraordinary Meeting will be convened to consider strategies and measures to address vulnerable marine ecosystems particularly in the deep seas.

c) Ensuring that capacity does not exceed long-term resource availability

None reported.

d) Enhancing monitoring, control and surveillance programs

None reported.

e) The establishment of adequate sanctions as a deterrent

None reported.

f) Investigate role and contribution of GEOSS data towards achieving sustainable fisheries

None reported.

g) Cooperation with FAO to improve knowledge of deep-sea fisheries species

One emerging Economy and one developed Economy reported that Economy-based experts joined "...the FAO expert Consultation on the Development of International Guidelines to Manage Deep-sea Fisheries on the High-seas", and indirectly the Economy reported that it participated in negotiations on the establishment of an RFMO to regulate deep-sea fisheries. Another developed Economy reported providing funding for the development of these guidelines. Whilst another developed Economy reported being active in the FAO process to establish the guidelines. The developed Economy who sent an expert to the FAO consultation also stated that it fully supported the FAO to provide "...guidance and knowledge on the management of deep-sea fisheries and their impacts, including at the 2006 UNGA [on]



sustainable fisheries discussions and the 27th session of the FAO Committee on Fisheries in 2007.

h) Involvement in the development of an APEC strategy on sustainable aquaculture
None reported.

Discussion of Organisational Perspectives (from the Survey of Organisations)

a) Application of the ecosystem-approach to fisheries management

The Organisation Survey highlighted the assistance and cooperation provided by research institutions, NGOs and IGOs, and RFMOs. Assistance and action with Economies was in the form of: training, research, promotion of awareness in identifying unsustainable practices, development of 'Environmental Risk Assessment' (ERA), sustainable fisheries certification, support through a UNGA Resolution and contribution to the FAO Guidelines on deep-sea fisheries. Mention of ERA and FAO guideline development reported by Economies and organisations highlights coordinated action in the region to support the implementations of the ecosystem approach to fisheries management.

b) Improving decision-making processes to reflect a precautionary approach

Improving decision-making through encouraging the use of the precautionary approach was reported by RFMOs, IGOs, NGOs and research institutions as being either embedded in their practices and operational framework or indirectly promoted through various programs. Specifically, these organisations reported assistance to Economies through: promoting awareness; identifying non-sustainable practices; assisting (mainly in the Pacific) in legislative management regime development; developing and applying ERA embedded in establishment instruments; fisheries certification programs; or implementing reference points in deep-sea fisheries management regimes (by an IGO in the Pacific). Interestingly, the development of a Fisheries Master Plan mentioned by one NGO as being developed for a developing Economy was not cited by that Economy through the survey response.

c) Ensuring that capacity does not exceed long-term resource availability

Organisation Survey responses report that efforts in this area were supported through a range of initiatives. These initiatives included: IGO, NGO training courses on sustainable and responsible fishing practices; RFMO member State obligations and initiatives (i.e. resolutions, technical assistance and funding assistance); performance indicators within the sustainable fisheries certification program; and POST-United Nations Conference on Environment and Development (UNCED) international instruments. The POST-UNCED international instruments referred to by one organisation in the Organisation Survey are varied and outline State Responsibilities for fisheries and marine conservation management many of which are contained within the BPA.

d) Enhancing monitoring, control and surveillance programs

Organisational responses to the survey showed a limited range of programs and initiatives to enhance MCS programs. By and large MCS is considered to be the domain and responsibility of sovereign States, and that opportunities for external cooperation with non-State entities may be restricted, hence providing one possible explanation for the limited organisation involvement in this action area. Examples of actions include: a Fisheries Master Plan; supporting MCS enhancement for coastal fisheries in the Pacific through technical and policy advice, including through training; RFMO Member State obligations and associated initiatives; and a sustainable fisheries certification program, which has been applied to at least four Economies for various fisheries.

e) The establishment of adequate sanctions as a deterrent

The Organisation Survey did not seek to reveal activity for this BPA Action Item.

f) Investigate role and contribution of GEOSS data towards achieving sustainable fisheries

The Organisation Survey revealed that almost all respondents have not explored the role that GEOSS data could play in contributing to sustainable fisheries. The exception to this, was reported by one Pacific-based IGO, which reportedly uses GEOSS data in Oceanic Fisheries Ecosystem Modelling.



g) Cooperation with FAO to improve knowledge of deep-sea fisheries species

Organisational respondents reported a limited and primarily non-participatory level of engagement in cooperation with FAO to improve knowledge of deep-sea fisheries species. Four organisations reported the following key actions: co-hosting an FAO Workshop on policy and issues relating to States; RFMO provision of advice to FAO on pelagic oceanic fish species; and indirect cooperation through a sustainable fisheries certification program when certifying deep-sea fisheries.

h) Involvement in the development of an APEC strategy on sustainable aquaculture

Organisations cited both domestic and regional initiatives 'claimed' to be in support of an APEC Strategy on Sustainable Aquaculture. The initiatives cited may be considered complementary to such a strategy and ranged from developing draft FAO/NACA Guidelines for Aquaculture Certification, through to sustainable aquaculture management plans and policy development for small island developing States (SIDS).

Section Summary

a) Application of the ecosystem-approach to fisheries management

Economy responses indicate a possible bias in application of the ecosystem approach to fisheries management, where implementation at the legislative, policy and strategic levels appears mainly to be achieved within the management frameworks of wealthier Economies. Emerging and lesser-developed Economies tend to report application of the ecosystem approach primarily with regard to MPAs.

However, the survey responses do suggest an overall improvement in the level of implementation across the region. With support through training, and other mechanisms identified in the Organisation Survey, the situation is reportedly improving, although obstacles are said to remain. The primary obstacles to broad application of ecosystem-based management, cited by more than one Economy, are: limited data, limited human resource capacity, financial restrictions and the need to develop cost-effective methodologies for management, and monitoring.

b) Improving decision-making processes to reflect a precautionary approach

Economy survey responses offer little evidence that the precautionary approach is being applied universally throughout the APEC Region in fisheries decision-making processes. Survey responses also show that, where the precautionary approach has been taken up on a broad basis, this is most often done by developed Economies. In such wealthier economies, the precautionary approach has been embedded into many mechanisms from legislation through to fisheries management strategies. Nevertheless, more than half of responding Economies reported strengthening the use of the precautionary approach to strengthen fisheries management. Examples of instruments where the precautionary approach is reported to have been embedded include: 'Risk Management Frameworks'; 'Legislation'; 'Environmental Impact Assessments of Fisheries'; 'Harvest Strategies'; and a 'Fisheries Management Decision-Making Framework'. International obligations relating to the precautionary approach under the UNFSA also appear to drive some Economies, i.e. implementation of the precautionary approach is obligatory under the UNFSA (see Article 6), which requires State parties to implement the approach in conserving and managing straddling and highly migratory fish stocks.

c) Ensuring that capacity does not exceed long-term resource availability

The medium-to-high level of positive response in the quantitative results to the question of whether fishing capacity is managed so as not to exceed long-term resource availability is not supported well by the qualitative data. The qualitative data indicates a skew in actual progress, where measures to address capacity are generally integrated into the fisheries management frameworks of developed Economies, which are sometimes supported by specific one-off measures, such as structural adjustment to remove fisheries concessions.

Some lesser-developed Economies have also reported positive progress, including: the use of TAC in combination with a vessel buy-back program, a moratorium on coastal fishing licences and increasing restrictions on fishing in high fishing pressure zones. However, a



number of challenges are presented, the most significant of which relate to IUU fishing.

d) Enhancing monitoring, control and surveillance programs

The quantitative and qualitative responses indicate two trends occurring simultaneously. One of these is that overall Economy engagement in enhancing MCS is positive. The other is that the range of actions, although varied, occur within developed and lesser developed Economies. Another matter only observable from an overview of the wide range of activities is that greater financial ability perhaps allows for wholesale enhancement of MCS programs in developed Economies; whereas, lesser developed Economies, perhaps as a result of financial restrictions and a lower level of capacity or exposure to the range of technologies and programs, implement a wide range of cost-effective measures. However, the format of the question did not explore this possibility; therefore, this hypothesis would need to be tested for validity at a later stage.

e) The establishment of adequate sanctions as a deterrent

The structure and content of the question allowed Economies to provide a generally positive response to the rate of 'adequate' sanctions being established as a deterrent. Qualitative responses show that in general, developed Economies tend to pursue apprehension, forfeiture, and imprisonment as sanctions and deterrents; whereas, lesser developed Economies primarily reported financial penalties. However, it is unclear from the responses whether sanctions have reduced IUU activity, or whether IUU has relocated. Thus, there is a possibility that the reductions in the number of offences, reported by at least one Economy, may only have had a positive outcome in the waters of that Economy.

f) Investigate role and contribution of GEOSS data towards achieving sustainable fisheries

Overwhelmingly, Economies indicated that engagement in investigating the roles and contributions of GEOSS data for achieving sustainable fisheries is low. Although Economy participation in GEOSS was reported at good levels in Question 6; the level of response and nature of explanatory data provided in relation to whether GEOSS data contributions are being investigated to achieve sustainable fisheries, highlights a possible need to strengthen the understanding of contributions that GEOSS data could make.

Survey findings and observations made at the BPA Implementation Workshop held at Manado in November 2007, highlight two critical factors: technological capacity and expertise need to be improved, and the channelling of collected information to the appropriate government agency is often challenging.

g) Cooperation with FAO to improve knowledge of deep-sea fisheries species

The wide range in quantitative responses on the level of Economy engagement with FAO to improve deep-sea fisheries knowledge representatively supported qualitative data; where slightly more than one-third of Economies reported moderate-to-high engagement.

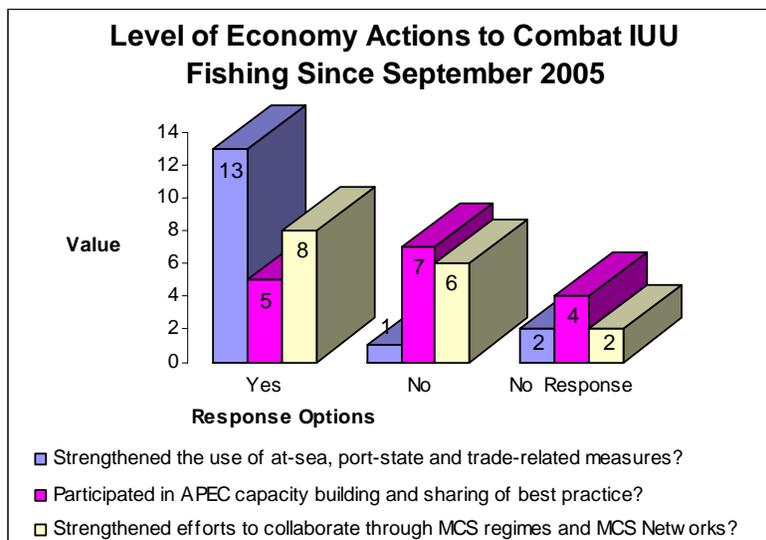
An interesting and very relevant regional initiative reported by an Economy was efforts to establish an APEC 'Network for Deep-sea Fisheries' to enable the exchange of information.

h) Involvement in the development of an APEC strategy on sustainable aquaculture

Only a small number of Economies reported a moderate-to-high level of involvement in developing an APEC 'Strategy on Sustainable Aquaculture'. The responses revealed knowledge of efforts to instigate the development of a strategy, although no formal strategy was reported to be under development. Responses show a need for support to develop a strategy, and that current resources have been directed to the establishment of 'Aquaculture Networks' that appear to be the precursor considered necessary for any APEC-wide strategy. Participants at the BPA Implementation Workshop held at Manado in November 2007 agreed that the development of a formal strategy would be possible based on the two networks (i.e. Network of Aquaculture Centres in the Asia-Pacific Region and the Aquaculture Network for the Americas).



Question 34	Relates to BPA Action: I.c.v
<p>Since September 2005, has your Economy done any of the following to combat IUU Fishing:</p> <p>a) Strengthen the use of at-sea, port-state and trade-related measures?</p> <p>b) Participated in APEC capacity building and sharing of best practices?</p> <p>c) Strengthened efforts to collaborate through MCS regimes and the MCS Network?</p>	<p>Strengthen efforts to combat IUU fishing including by pursuing the use of at-sea, port-state and trade-related measures, in accordance with international law, as key compliance tools, through APEC capacity building and sharing of best practices, and strengthen efforts to collaborate through MCS regimes and the MCS Network.</p>



Interpretation of Quantitative Data

A strong majority of Economies reported that the use of at-sea, port-State and trade-related measures has been strengthened since September 2005 to combat IUU Fishing. Only five Economies reported participation in APEC capacity building and sharing of best practice, while 50% reported strengthening efforts to collaborate through MCS regimes and networks.

Domestic Initiatives

a) Strengthen the use of at-sea, port-state and trade-related measures

One developed Economy reported that it resumed recruiting enforcement officers in 2005-06, and that 85 officers have graduated with another 50 officers reported to be scheduled to graduate in early 2008. The Economy reported that with the new officers, and an already effective dockside monitoring program, it continues to take steps to address IUU activity. As previously reported, a developed Economy, is in the process "...of significantly increasing its ability to combat IUU fishing at sea through the [deployment] of six new patrol vessels and aerial surveillance..., [which] will allow...[the Economy]...to conduct boarding and inspections in its EEZ and on the high seas to support the objectives of relevant regional and sub-regional arrangement [that it] is a party to". This Economy also stated that fishing vessels wishing to enter ports are subject to inspection in accordance with the FAO Model Scheme. Vessels wishing to land fish were said to require prior approval and prove that the fish are from authorised activities, which are then subject to observer monitoring.

Another developed Economy reported that the importation of tuna and tuna-like species from vessels that are not on positive lists, in accordance with "...relevant RFMO..." decisions are prohibited. Another developed Economy highlighted that the main emphasis to combat IUU fishing has been in regard to strengthening at-sea surveillance and enforcement measures in



its northern waters. In response to a sharp rise in IUU fishing in 2005, that Economy "...bolstered [efforts] significantly [through] the following measures: deployment of customs and defence patrol boats and surveillance flights in northern waters; and increased capacity of [the fisheries authority] to conduct investigations into foreign fishing offences". The Economy also reported: the establishment of detainee and apprehended vessels facilities; the appointment and posting of customs officials in another country to progress cooperative measures and ongoing delivering of information on the penalties of IUU fishing to discourage foreign IUU fishing; co-hosting a regional initiative to develop actions to combat IUU fishing practices in Southeast Asia; and enhancing biosecurity surveillance and response in remote areas. The Economy also stated that there have been amendments to fisheries legislation since September 2005, for example, vessels are forfeited if they are caught twice within a two-year timeframe, and all things found on board seized vessels, are also forfeited including any fish.

One Economy emphasised the importance of discussions with coastal States to encourage them to take more effective enforcement measures to protect their own marine resources. Another developed Economy said that it "...provides information on the movement of suspected IUU cargo vessels and their cargo upon request from [any] Member Economy or RFMO".

An emerging Economy reported that it is currently enacting new legislation for 'Distant Water Fisheries', that include port-State provisions to promote compliance with RFMO conservation measures, such as, a port inspection scheme, and restrictions on landings and transshipment of IUU catches.

A Economy noted that as a member of the Indian Ocean Tuna Commission (IOTC), the licensing and marking of vessels are registered with the IOTC. The preparation of a NPOA on Responsible Fisheries including combating IUU fishing was also reported to be in progress. Another developing Economy highlighted that its Navy carries out surveillance and enforcement actions to monitor fishing activities. While another stated that it has prohibited IUU vessels from entering its ports.

Three Economies did not provide any elaboration to this sub-question.

b) Participated in APEC capacity building and sharing of best practices

A developed Economy reported that it had attended APEC FWG and MRCWG meetings and workshops, and shared its experience through this fora in protecting the marine environment, conserving ecological habitat and species, and reducing fishing capacity.

"Through the development of an 'RPOA on best Fishing Practices' with APEC Members" one developing Economy noted that it participates in capacity building and sharing of best practices. The Economy reported that this RPOA was adopted by Ministers in 2007. A developed Economy also expressed the opinion that while the RPOA was "...not developed within APEC processes, it nevertheless fully supports the concept of capacity building and the sharing of best practice". This Economy also reported that capacity building has been identified in the RPOA to be further developed at a workshop, which was scheduled to take place in November 2007, and that APEC requirements are being incorporated into the RPOA, including the development of sub-regional and regional networks to enhance the exchange of information and to foster the sharing of best practice.

Thirteen Economies either did not answer the question at all, or did not provide elaboration in support of quantitative responses.

c) Strengthened efforts to collaborate through MCS regimes and the MCS Network

One Economy noted that it has a small fishing fleet only of less than 20 vessels, all under 50 metres in length. Two developed Economies reported that they are proponents of MCS regimes, with one claiming that it seeks to utilise its NCS network at every opportunity to share information. The second of these two Economies also reported that it has hosted MCS Network meetings and has pledged financial support for ongoing work. In addition, one of these Economies reported that it also participates in RFMOs, and through these mechanisms,



“champions” enhancements to enforcement measures to help combat IUU activity, in addition to providing enforcement resources.

An Economy reported that USD 553 million equivalent has been budgeted for armed patrols and an enhanced ability to respond to IUU fishing. Additionally, this Economy noted that it has a joint-patrol program with another country based on a cooperation treaty, where regular joint patrols are conducted. Finally, this Economy also cited an educational program occurring in a neighbouring country to educate fishers on the consequences of IUU fishing and alternative livelihoods.

A developing Economy observed that it has attended workshops on the International MCS Network, and although it has yet to participate in the Network, it intends to do so. A developed Economy cited the provision of information to RFMOs and Economies on the movements of suspected IUU cargo vessels. An impediment noted by a developing Economy was that it is not a member of the MCS Network. Also, an emerging Economy reported that it is not a member of the MSC Network; however, it observed that it has undertaken the following measures: fishing vessels larger than 100 tonnes have been installed with VMS in accordance with RFMO resolutions, and small tuna long-liners are also scheduled to have VMS installed; patrol vessels are despatched to the Pacific and Atlantic to monitor its flag vessels; a scientific observer program has been ongoing for many years; and no tuna vessel listed on a negative list held by an RFMO is allowed to enter its ports.

Another emerging Economy reported that it has expended strong efforts for MCS with regard to pelagic fisheries, including: a VMS on commercial vessels, on-board observers including for bird and mammal observations. Additionally, the Economy stated that it developed a satellite surveillance system for a squid fishery, and that quota management applies to other fisheries. Other activities cited relate primarily to MPAs and general area-based management initiatives implementing an ecosystem approach to marine management. The establishment of legislation to regulate tuna fisheries and protect dolphins and whales was also reported by the Economy.

One developing Economy stated that it is developing a NPOA on Responsible Fisheries including combating IUU fishing. This Economy is a signatory to the RPOA. Another developing Economy reported that it is passing new legislation to make VMS mandatory for all fishing vessels.

Regional Initiatives

a) Strengthen the use of at-sea, port-state and trade-related measures

A developed Economy reported that as a party to the North Pacific Anadromous Fish Commission (NPAFC) it has cooperated to conduct joint air patrols in the North Pacific. These efforts are supported by a web-based system to transmit real-time information on IUU vessels conducting illegal driftnet fishing (e.g. seven vessels detained and 90 tonnes of salmon seized towards the end of 2007). In addition to cooperation with the NPAFC, this Economy reported joint efforts with the European Union at an ICCAT meeting that led to acceptance by the Commission of a document outlining general elements for both an ICCAT boarding and inspection scheme, and port-State measures. The Economy reported that work will continue on draft port-State Measures and draft Boarding and Inspection Measures.

While an emerging Economy reported domestic measures, it also stated that it “...is actively involved in international port-Stated measures including the preparation and conclusion of an agreement with another Economy on port-State measures”.

b) Participated in APEC capacity building and sharing of best practices

None reported.

c) Strengthened efforts to collaborate through MCS regimes and the MCS Network

One developed Economy stated that it is involved in regional MCS regimes including through the Forum Fisheries Agency (FFA), and currently provides aerial surveillance for the region and additionally engages in working groups to ensure that regional networks are used



effectively and strategically. Deployment of new patrol vessels was reported to strengthen the efforts of this Economy in support of regional MCS regimes.

Relevant International Initiatives

a) Strengthen the use of at-sea, port-state and trade-related measures

One developed Economy acknowledged its support of the FAO for the creation of a binding international instrument on port-State measures (based on the FAO port-States Model Scheme), and that through past work with the High Seas Task Force (now disbanded) and FAO, the Economy works with international partners to ensure that trade-measures can be used to combat IUU fishing.

b) Participated in APEC capacity building and sharing of best practices

None reported.

c) Strengthened efforts to collaborate through MCS regimes and the MCS Network

One developed Economy stated that it "was an advocate for the creation of the MCS Network and [that it] provided (and continues to provide) considerable support for the Network". Another developed Economy reported that it has been involved in the International MCS Network and has provided support and funding. This Economy also reported that it provided information and data on IUU fishing from its region to the Global IUU Monitoring Workshop organised by the United Kingdom.

Another developed Economy reported that, in addition to domestic and regional efforts, its participation in technical consultations (i.e. FAO meetings of experts) contributed to international initiatives to combat IUU activity. This Economy also reported being involved in international enforcement programs, such as 'Operation Driftnet' patrols in the North Pacific where it contributes enforcement resources to combat IUU activity.

Discussion of Organisational Perspectives (from the Survey of Organisations)

Organisation Survey responses indicated a strong belief that actions to combat IUU Fishing are generally considered the purview and responsibility of sovereign States. Organisations reported primarily that they are involved in collaborative efforts with Economies mainly for the effective use of port-State and trade-related measures.

The central areas of action and collaboration by organisations with Economies, include: assistance through training and research; collaboration in the development of the 'RPOA to Promote Responsible Fishing Practices including combating IUU fishing in the region'; collaboration in MCS regimes and networks; RFMO measures; and finally a chain of custody certification program which is in effect in some Economies.

Section Summary

The breadth of reported Economy initiatives, programs and projects strongly correlate with trends observed in the quantitative responses. This provides a good level of confidence in the quantitative responses. Some Economies discussed overarching structural adjustments to enhance the ability to combat IUU fishing activity. Others reported specific positive progress including new legislation to regulate the activities of distant water fishing fleets, and preparation of a draft RPOA to Promote Responsible Fishing Practices, including combating IUU fishing. This RPOA is also noted in the Organisation Survey as an area in which an organisation provided assistance.

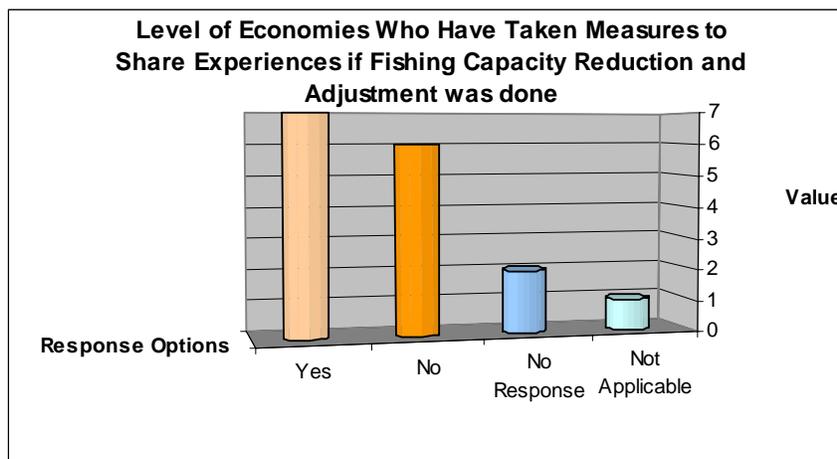
Regional enforcement patrols are a common activity reported by developed Economies. Additionally, APEC-wide progress was reported on the strengthening of MCS regimes or networks overall. Some positive efforts were reported to have an international focus, especially through the FAO port-State Model Scheme and International MCS Network. Finally, participants at the BPA Implementation Workshop at Manado in November 2007, identified a need to move away from the currently popular one-time workshop model to a holistic on-the-ground strategic and enabling approach, and that such an approach should



seek to include non-governmental and industry representatives.



Question 35	Relates to BPA Action: I.c.vi
Since September 2005, has your Economy taken measures to facilitate the sharing of APEC Economy experience in fishing capacity reduction and adjustment?	Identify mechanisms to better manage fishing capacity, such as through projects that facilitate the sharing of APEC Economy experiences in fishing capacity reduction and adjustment, to help ensure a balance between such capacity and long-term resource sustainability.



Interpretation of Quantitative Data

Almost half of the respondents indicated that their Economies have taken measures to facilitate the sharing of APEC Economy experiences in the reduction and adjustment of fishing capacity. On the other hand, there are many Member Economies that reportedly have not done so, which suggests scope for greater collaboration and possibly awareness building.

Domestic Initiatives

As reported by one developed Economy, a National Program of Action for the Protection of the Marine Environment from Land-based Activities has been developed to address issues at the regional and national levels. The program was said to be based on principles of sustainable development, integrated management and the precautionary approach

Regional Initiatives

Four developed Economies and two developing Economies reported participation in the APEC FWG project on Sharing Experiences in Managing Fishing Capacity in 2006. All the developed Economies noted that presented their experiences in reducing domestic fisheries capacity. One of the developing Economies also attended and presented papers in a Workshop for Sustainable Fisheries Management.

Relevant International Initiatives

A developed Economy said that it provided information to the Organization for Economic Cooperation and Development (OECD) Committee for fisheries under the 'Securing Our Fisheries Future Structural Adjustment Package.'

Another developing Economy cited its fulfilment of the objectives of the FAO IPOA – Fishing capacity. It reported that it incorporates the principles of the FAO code of conduct for responsible fishing in its legislation. Further, efforts were said to have been developed to reduce national fishing efforts by applying the ecosystem approach and trying to conserve fisheries in the long run by increasing MCS for fisheries.

**Discussion of Organisational Perspective (from the Survey of Organisations)**

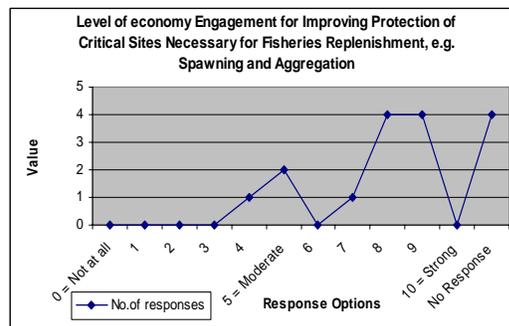
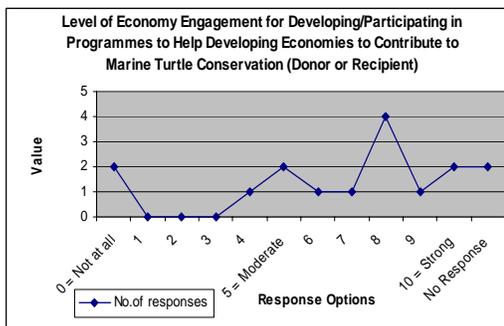
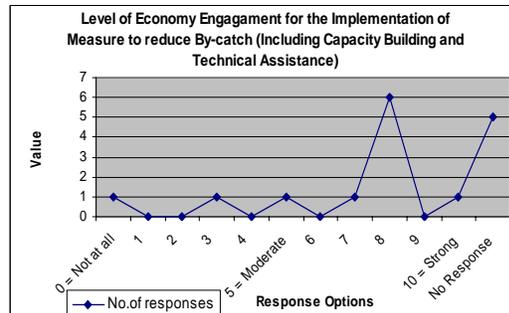
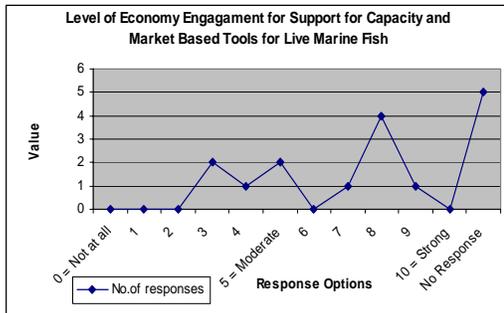
The observed level of organisation participation in this BPA Action area was generally low, although the effect of activities may be presumed to have had a solid on-the-ground outcome for some Economies towards improving implementation of this BPA Action area. One significant observation identified by one respondent is that overall there are very few programs in place to address fishing capacity adjustment or reduction, indicating an area where APEC can continue to promote the further enhancement of sustainable fisheries management.

Section Summary

Apart from participation by some Economies in an APEC FWG to share experiences in fishing capacity adjustment, none of the qualitative responses offered any evidence of such experience sharing. Indeed, the qualitative comments did not even convincingly offer evidence of capacity adjustment. The absence of such evidence, combined with quantitative responses that show weak participation in experience-sharing for fishing capacity management, suggest that this is an area that warrants further effort.



Question 36	Relates to BPA Action: I.c.viii, I.c.ix, I.c.x, I.c.xiii
<p>Since September 2005, to what extent has your Economy engaged in the following marine conservation measures:</p> <p>a) Supporting capacity and market-based tools for live marine fish?</p> <p>b) Implementing measures to reduce by-catch?</p> <p>c) Developing or participating in programmes to help developing Economies to contribute to marine turtle conservation?</p> <p>d) Improving protection for critical sites necessary for fisheries replenishment?</p>	<p>viii: Support capacity building and market-based conservation tools for live reef fish, including codes of conduct for sustainable trade in reef food and ornamental fish and measures, as appropriate, for eco-labelling of reef fish.</p> <p>ix: Assist APEC Economies with implementing measures to reduce by-catch resulting in unintentional mortality. These include potential projects on capacity building and technical assistance to reduce by-catch mortality of species incidentally caught, including marine turtles, in fisheries operations, by demonstrating the benefits of mitigating technology.</p> <p>x: Develop programs to help developing Economies contribute to marine turtle conservation based on FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations as well as to help implement, as appropriate, the Indian Ocean and South east Asia (IOSEA) Turtle Memorandum of Understanding, and the Inter-American Convention on the Protection and Conservation of Marine Turtles.</p> <p>xiii: Improve the protection of critical sites for the replenishment of fisheries, such as spawning and aggregating sites.</p>





Interpretation of Quantitative Data

This four part question investigates the extent to which Economies have engaged in marine conservation measures since 2005:

a) Half of respondent Economies indicated that they have supported capacity building and developed market-based conservation tools for live marine fish. However, there was a high number of Economies that declined to answer this question, which possibly reflects the relevance of reef fish only to some APEC Economies.

b) Similarly, a majority of respondent Economies reported that they have implemented measures since September 2005 to reduce by-catch, but about one third did not respond to the question. For some Economies, particularly those in tropical waters, species diversity is so great and the market is such that only iconic species, such as turtle or dolphin, are considered to be "by-catch". However, qualitative data suggests that by-catch minimisation strategies are widely adopted throughout APEC Economies.

c) With regard to developing or participating in programs to help developing Economies to contribute to marine turtle conservation, more than half of the participating Economies responded with a good-to-strong response. However, two Economies did not respond to the question, and two others indicated that they have taken no initiatives in this area. When combined with the Economy that marked its performance in this regard as less than moderate, a total of almost one third of Economies are potentially not active, or not very active in this endeavour, suggesting scope for further effort.

d) More than half of the respondent Economies indicated strongly that they have improved the protection of critical sites for the replenishment of fisheries. However, a high number of 'No Response' could suggest that a significant number of Economies are yet to take action in this regard.

Domestic Initiatives

One developed Economy said that it recognises cyanide as a major conservation threat and has worked on methods for the detection of cyanide in fish. In Feb 2008, this Economy reportedly convened an expert workshop to explore options to deter trade in live reef fish obtained from cyanide fishing. An Asian Economy launched an "Accredited Fish Farm Scheme" to encourage registered farms to practise sustainable aquaculture methods. An Economy reported consumers' preference for healthy fish with good-handling strategy as the key marketing tool of its live marine fish trade. Another Economy cited cooperation with related NGOs in this matter. According to a developing Economy, licenses are issued only to environmental-friendly fishing gears (traps, hooks and line) to catch live marine fish.

Ten Economies reported that they have regulated for modified gear or have introduced excluder devices to mitigate by-catch, while three Economies reported full utilisation of catch (i.e. No bycatch). One Economy reported that all catches must be retained, landed and reported. By-catch mitigating measures "...including by-catch limits, improved selective fishing practices and changes to gear technology..." are implemented by that Economy. In addition, there is a mandatory landing requirement for all groundfish for stock assessment purposes. Nordmore Grate was said to have been introduced in shrimp trawls on top of toggle and chain regulations. These regulations aim to reduce by-catch of bottom species by keeping the net above the ocean floor. Other by-catch initiatives taken by this Economy include: area closures to ensure rebuilding of the rockfish stock; introduction of a pilot program on Integrated Groundfish Management in 2006 which involves 100% at-sea monitoring, 100% dockside monitoring, and a quota-based groundfish fisheries; an annual Conservation Harvesting Plan; and Small fish and By-catch Protocols.

One Economy reported that it adopts technical and manpower regulations to reduce by-catch. Large circle hooks are used in several fisheries, while a turtle excluder device is deployed in shrimp fisheries. Several 'Take-reduction Teams' were said to have been established to reduce marine mammal by-catch. Meanwhile, a fishery by-catch policy was reported to have been released by a developed Economy in 2000 to ensure fisheries are managed sustainably



through by-catch reduction, protection of vulnerable species, and minimisation of the impacts of fishing on the marine environment. A review was carried out on this policy in 2005. The fisheries of this Economy reportedly have to undergo an independent environmental assessment to determine the ecological sustainability of the fishery management arrangements, and fishers are required to develop by-catch mitigation measures. In one of the Economies, square mesh cod-ends and mandatory by-catch reduction devices were said to be included in various shrimp harvesting gears, escape panels in fish traps, and temporary closures enacted for high by-catch areas.

One Economy has reportedly deployed Juvenile Turtle Exclusion Devices (JTED), while two other Economies claim to have imposed the usage of 138mm cod end mesh in trawlers. Another Economy stated that it has conducted studies with research institutes, and deployed turtle excluder devices in trawl fisheries in the Arafura Sea. Annual grants were said to have been given for sea turtle conservation efforts under a Marine Turtle Conservation Act.

An Economy reported that it has drafted an official standard to regulate turtle grounds and to protect nesting beaches and feeding areas. An emerging Economy cited the prohibition of trading in marine turtle products, and claimed that a national "Year of the Turtle" Committee was formed to help conserve marine turtles. In addition, a network of experts and facilities was said to have been created to share knowledge on turtles locally. Similar initiatives were cited by another Economy.

In terms of protection for critical fisheries replenishment sites, seven Economies reported having or being in the process of designating marine parks. Fishing zones based on gear type and size of vessels were delimited in one of the Economies.

Four Economies claimed to impose seasonal closure on sensitive areas, while one developed Economy said that it runs a project to map and collect data on its coast and ocean floor. This data reportedly is used for planning and management purposes for sensitive ecosystem areas. This Economy declared that it is currently developing a policy to manage the impacts of fishing on sensitive benthic areas.

One developing Economy reported that it imposes restrictions on fishing in spawning and breeding grounds.

Regional Initiatives

An Economy claimed to have participated in capacity building and regional aquaculture programs under APEC. Another Economy reported legislative harmonisation with other commercially important countries. An Economy reported that it has helped to formulate guidelines for live food fin-fish in the region through ASEAN. Another stated that collaboration work has been carried out with SEAFDEC on fishing with circle hooks and research on JTED usage.

Three Economies reported that they are members of the InterAmerican Convention for the Conservation and Protection of Sea Turtles. Two Economies claimed to have signed the Indian Ocean Southeast Asian Marine Turtle Memorandum of Understanding. One Economy said that it participated in CPPS Regional Program for Marine Turtles Conservation and attended the Meeting of the Group of Experts for Validation of this Program, as well as the Workshop for Planning and Priority of Activities for Marine Turtles Conservation. This Economy said that it also prohibits the capture, trade and transport of all species of sea turtles, and claimed to have provided funding to the Secretariat of the Pacific Regional Environment Program.

Four developing Economies observed that they are involved in a regional turtle conservation program. One of these Economies claimed to have participated actively in leading the countries under an MOU on ASEAN Sea Turtles, involving a sea turtle statistics management and tagging program. ASEAN were reported to have worked with SEAFDEC to develop a 5-year research program on sea turtle stock enhancement. Collaboration with an IGO was said to have benefited this Economy by outlining 15 points for sustainable sea turtle management.



Another ASEAN Economy claimed to have been involved in a regional conservation effort through Verde Passage Marine Biodiversity Corridor Programs of International Conservation.

Relevant International Initiatives

A developed Economy declared that it heeds the FAO Code of Conduct for Responsible Fisheries and recognises the need for development of transparent, accountable and equitable eco-labelling schemes. One Economy cited its participation in WTO negotiations on fishing subsidies, while a developed Economy reported that it implements an improved management plan on humphead wrasse in a developing country since this species was listed by CITES. This Economy also claimed to support the establishment of IMA CDT testing labs in Southeast Asian countries, though it deemed this initiative to be ineffective. Another developed Economy stated that it contributes to the FAO trust fund and provides technical assistance to countries concerned.

A developed Economy also claimed to provide training to Caribbean countries on marine mammal stranding response.

Another developed Economy said that it works with developing countries to strengthen sea turtle conservation programs by satellite tracking, nesting beach protection, and the promotion of circle hooks and turtle excluder devices.

Discussion of Organisational Perspective (from the Survey of Organisations)

BPA Action: I.c.viii

The respondent organisation contribution levels to sustainable codes and conduct for reef and ornamental fish and eco-labelling for reef fish are generally low. There are however some programs, where the potential for establishing collaborative alliances towards building sustainable practices in reef fisheries may be beneficial. The current initiatives should provide a basis where experiences can be shared both within and outside of the APEC framework, towards a wider application of sustainable fisheries practices.

Three organisations indicated actions in relation to promoting “codes of conduct for sustainable trade in reef food, where one NGO indicated activity in this for fish species from rocky reefs and that early discussion with fisheries operating in coral reef environments is underway. One NGO indicated training and an IGO indicated participation in a workshop in 2006. Another IGO indicated that the issue had been visited during FAO guideline development although, for the last initiative it was unclear whether any solid outcome related to reef fisheries. One IGO indicated, the potential for further development of activities in the Pacific in relation to a code of conduct for sustainable trade in ornamental reef fish possibly being in the pipelines, thus lessons learnt could be shared along with expertise and experiences toward an inter-regional reef fish sustainability program. Three organisations observed involvement in promoting and developing codes of conduct for a sustainable ornamental fish trade. A number of organisations indicated activities related to eco-labelling programs either already in practice or under development. These initiatives highlight a BPA action area where specific programs for reef-fisheries may be promoted by APEC towards fruition of reef-fish eco-labelling framework.

BPA Action: I.c.ix

Two organisations reported minimal activities while three organisations indicated a medium level of activity in relation to bycatch management. Within a broader context, the range of activities do provide an overall positive effect with regard to awareness building of the growing concern over the bycatch issues in marine fisheries. Seven organisation respondents indicated that bycatch reduction was either not their function or not within their mandate and one IGO indicated that they had not been asked to provide assistance suggesting (based upon the nature of this IGO) a belief that they should be involved in bycatch reduction with member States. A review of past assistance provided to Economies for bycatch reduction may be in order, to enable further development of positive outcomes.



Respondent organisations did not provide any examples where Economies have demonstrated the benefits of mitigating technology in reducing bycatch in fisheries. One organisation indicated that it is difficult to tie bycatch reduction back to a specific economy, even though ecological and economic benefits may be apparent. The respondent then suggested that research would be needed to highlight the ecological and economic benefits.

BPA Action: I.c.x

Overall, respondent involvement in programs targeting developing Economies in the Asia Pacific Region for marine turtle conservation was limited, particularly for the turtle conservation instruments identified in the question. Direct effort in relation to the “FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations” was reported by four organisations whereas, no respondent organisation indicated involvement in the other marine turtle conservation instrument. Associated efforts were reported to be occurring through organisational programs and initiatives in South East Asia and the Pacific. The exact level of APEC Economy benefit and association with these efforts was however unclear, although some benefits are likely. Additionally, one RFMO indicated that they have extensive conservation programs and have been involved in collaborative efforts with NGOs and governments to educate fishermen to promote turtle conservation in the Latin American region. Cross-cutting or collaborative efforts with these organisations are therefore limited, although indirect activities in other marine turtle bycatch reduction programs may provide some future collaborative opportunities.

BPA Action: I.c.xiii

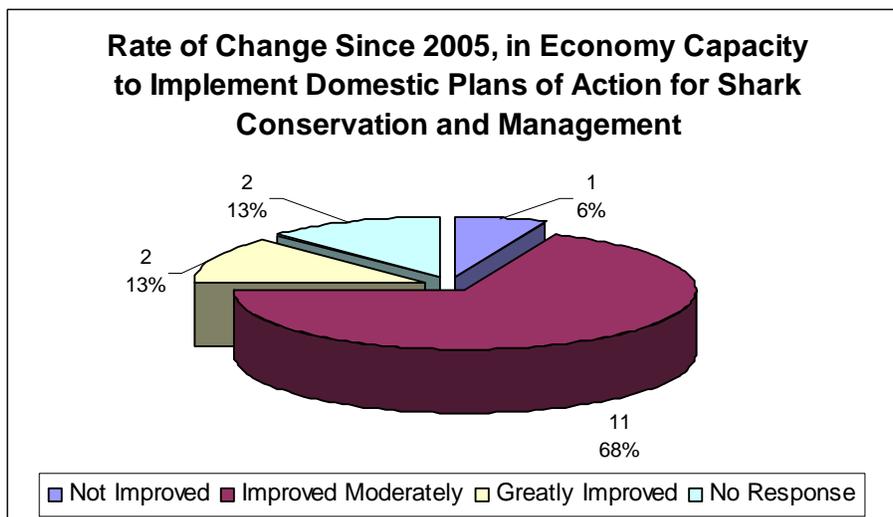
Overall, organisations reported limited initiatives relevant to improving the protection of critical sites for the replenishment of fisheries. However, some indicated that this BPA Action area had a reasonable level of existing initiatives and mechanisms. At the domestic level biodiversity surveying, and adaptive learning, participation and local consultation underscore aspects that have had a positive direct effect for some Economies. Regional activities, including training courses on MPA development and implementation, and habitat restoration projects through ICM would also have provided opportunities for fisheries replenishment. Additionally, the efforts of one IGO operating outside of the scope of the APEC framework (apart from one Economy who is a member of both APEC and the IGO) are likely to have resulted in a concentration of expertise for advising on programs for fish replenishment, which could be of benefit to Economies. Of particular interest, was the development of an MOU to improve the conservation of reef fish aggregation sites.

Section Summary

Although half of the respondent Economies indicated that they have supported capacity and market-based tools for the conservation of reef fish, no qualitative examples were given of any such market-based tools. Numerous examples were cited of initiatives to reduce by-catch and protect turtles. However, the strangest response in this question related to the part concerning the improvement of protection for critical sites for fisheries protection. Almost three quarters of Economies indicated strong to moderate effort in this regard, and that level of initiative was reflected also in the qualitative comments.



Question 37	Relates to BPA Action: I.c.xi
Since September 2005, has the capacity of your Economy to implement domestic plans of action for shark conservation and management: a) Not improved b) Improved moderately c) Greatly improved	Develop the capacity of APEC Economies to implement domestic plans of action for shark conservation and management.



Interpretation of Quantitative Data

A large majority of respondent Economies rated their capacity to implement domestic plans of action for shark conservation and management to have 'Improved Moderately' or better, with only three Economies either not reporting or showing no improvement. Importantly, this question relates specifically to the BPA Item I.c.xi and therefore seeks to identify 'capacity' to implement domestic plans for shark conservation and management; it does not reveal the extent to which such plans have actually been implemented.

Domestic Initiatives

Nine Economies cited implementation of a NPOA for sharks. However, no elaboration was given on the capacity of these Economies to implement the NPOA. One Economy reported the implementation of conservation and management measures in accordance with RFMO and CITES standards.

A developed Economy stated that it is currently carrying out a comprehensive review of the NPOA-Sharks which was implemented prior to 2005. "...A formal consultative committee (the Shark Implementation and Review Committee-SIRC), has been established to give effect to the NPOA." The same Economy reportedly has also developed recovery plans under its Environmental Protection and Biodiversity Conservation Act 1999 for listed threatened sharks. Various actions are being carried out dependent on the local authority of this Economy. One Economy claimed to have implemented research related to shark meshing activities; developed a draft recovery plan for endangered sharks; declared the critical habitat for endangered sharks; imposed fishing and diving restrictions in critical habitat; established a breeding program for endangered sharks; conducted community education and awareness programs; established an MPAs network with regard to the requirements of endangered sharks; introduced regulatory closures to prevent the practice of finning sharks and discarding carcasses at sea; commenced a commercial fisheries observer program; adopted a strategy for the Ocean Trap and Line Fishery that addresses active management of secondary species (including sharks); and set total annual catch limits, weekly catch limits, and catch



reporting for shark landings [trip (carcasses) and size limit controls for Wobbegong sharks are included in the Ocean Trap and Line Fishery Management Strategy]. Another Economy cited significant changes to shark management through major effort reductions, changes to gear usage and introduction of closures for significant areas.

Whale-shark fishing has been prohibited by one Economy since 2008. This Economy also requires its fishing vessels to have on board “fins that total no more than 5% of the weight of sharks onboard”. Another Economy reported that, since 2007, it has prohibited the taking of white pointer sharks both within its EEZ and by flag vessels fishing on the high seas.

An Economy reported that it has developed efforts to collate data on shark fisheries through the framework of a plan of action for sharks. Two Economies stated that they held awareness programs on conservation of sharks.

Regional Initiatives

An Economy noted the non-existence of a shark fishery in its waters and therefore, said that no management is in place. However, this Economy has participated in a SEAFDEC shark study by participating in denticle identification. A developing Economy indicated joint research with a developed Economy on Shark fisheries and has claimed to have been able to identify the status of several shark stocks.

Another Economy reported participation in Regional Plans of Action for shark conservation and management in the South China Sea, under the purview of SEAFDEC.

Relevant International Initiatives

In 2007, the National Fishery and Aquaculture Commission of an Economy issued an official standard on responsible fishing for sharks and rays, along with “...systematic research (training, data collection and analysis and establishment of a management plan), education, training programs, participatory inspection, and monitoring with the fishing industry and society in general...”, which were incorporated in the national plan released in 2004.

Discussion of Organisational Perspective (from the Survey of Organisations)

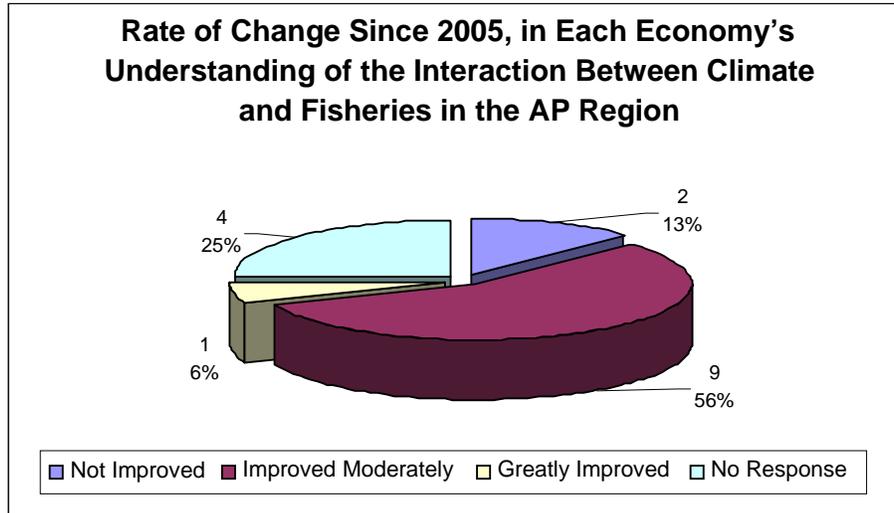
No elaboration was provided on organisation assistance to Economies or other States towards developing the capacity for implementing domestic plans of action for shark conservation and management. This BPA Action area is not widely participated in by the respondent organisations, although, one NGO did indicate the potential for future sustainable fisheries certification programs for fisheries where shark interactions are high.

Section Summary

Several impressive and decisive initiatives were cited in the qualitative responses; however, most Economies remained silent on details of how they have improved capacity to implement plans of action for shark conservation and fishing management. Noting the large majority of Economies that indicated only ‘moderate’ improvement, such a paucity of examples could suggest that this area of the BPA may still require considerably more effort.



Question 38	Relates to BPA Action: I.c.xii
Since September 2005, has understanding in your Economy of the interaction between climate and fisheries in the Asia-Pacific region: a) Not improved; b) Improved moderately; c) Greatly improved?	Develop a better understanding of the interaction between climate and fisheries in the Asia-Pacific region.



Interpretation of Quantitative Data

More than half of the participating Economies indicated that their understanding of the interaction between climate and fisheries has improved only moderately since September 2005. Also, more than a third stated that their understanding of this specialised subject had either not improved or no response was attempted.

Domestic Initiatives

One Economy reported that it has concentrated studies on the effects of climate change. Two major studies on climate change were said to have been completed, one related to the impacts of climate change on marine life; the other investigating climate impacts on fisheries and aquaculture. These studies reviewed current knowledge, describe possible climate change impacts, and in the case of the former, made recommendations for policy and research directions. The Economy stated that a report about the vulnerability of the coastal zone to climate change was later published, providing a broad overview of the vulnerability of the Economy's fishing and aquaculture industry. In 2007, the Economy's government endorsed a National Climate Change Adaptation Framework, which resulted in the development of a National Climate Change and Fisheries Action Plan (NCCFAP).

A developed Economy noted that climate fluctuations affect the recruitment in fisheries but observed that the long term effects are unknown. Potential issues of concern regarding climate change were said to include effects on the productivity, ocean acidification, increasing water temperatures, toxic algal blooms, and changes in local ocean circulation.

Another developed Economy claimed to have promoted the establishment of a Climate Change Impacts and Adaptation Research Network. This reportedly resulted in over 130 projects before the network closed. Additionally, that Economy cited continued effort on projects aimed at informing planners and engineers, "...so that they factor adaptation into their work, as well as the development of tools to assist decision-making related to climate change adaptation." The Natural Resources department of the Economy were also said to have assessed the existing knowledge of climate change and released a report in the fall of



2007.

Another Economy claimed to have allocated financial resources for scientific research on the impacts of climate change to fisheries resources. However, a developing Economy said that it relies on newspaper reports and publications to improve their understanding on this topic. Another Economy claimed that it enhances its understanding by dissemination of information on climate change and through consultations undertaken by the government.

An Economy reported that, in 1990, it experienced the impact of El-Nino currents on the sardine fishery. This Economy reported that it has since set up monitoring activities to predict the economic impact of the El-Nino phenomenon.

Regional Initiatives

An Economy reported that it is a member of PICES (North Pacific Marine Science Organization), which was said to research the influence of global warming on marine ecosystems and marine living resources. Another Economy stated that it participates regionally on relevant initiatives under the purview of SEAFDEC.

Relevant International Initiatives

An Economy reported to this question with the following text: "According to the fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC), [the Economy] has formulated the third comprehensive measures for the United Nations Framework Convention on Climate Change (UNFCCC), and is currently establishing the fourth comprehensive measures based on the IPCC Fourth Assessment Report. The measures include impact of climate change on the oceans and fisheries sector and responses to climate change".

Discussion of Organisational Perspective (from the Survey of Organisations)

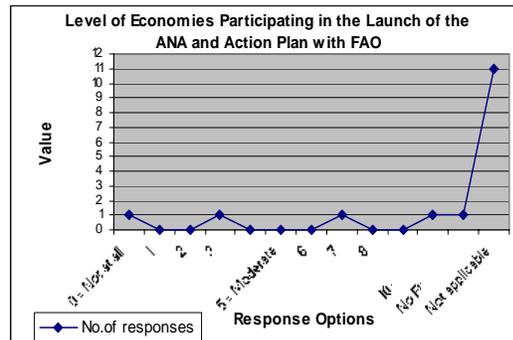
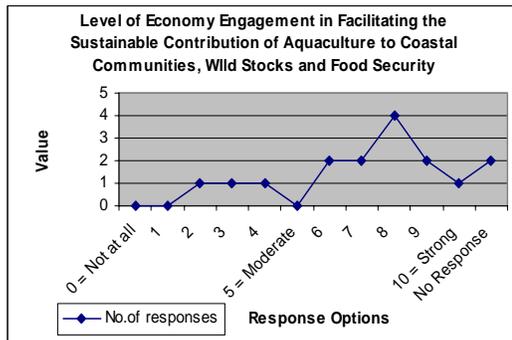
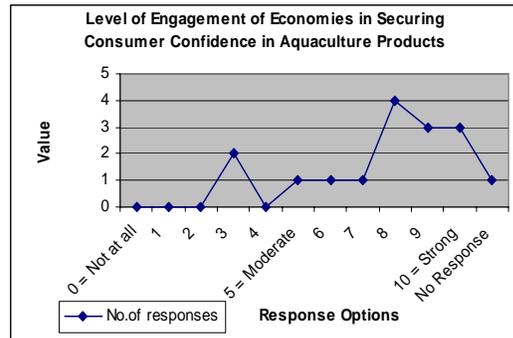
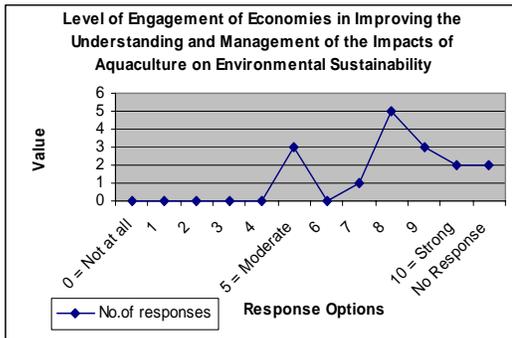
Organisational assistance in providing a better understanding of the interactions between climate change and fisheries in the Asia Pacific Region was found to be occurring at the domestic, regional and international levels. These past and present initiatives highlight a moderate level of organisation involvement in this BPA Action area. One initiative at the Economy level where adaptive learning, participation and consultation occurs could provide opportunities for shared learning across APEC. While another initiative being undertaken by an IGO mainly outside of the APEC Economies, could produce future outcomes which may be of benefit towards understanding climate-fisheries interaction on a broader scale within the Pacific.

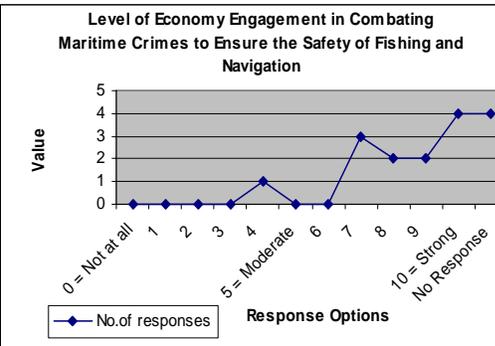
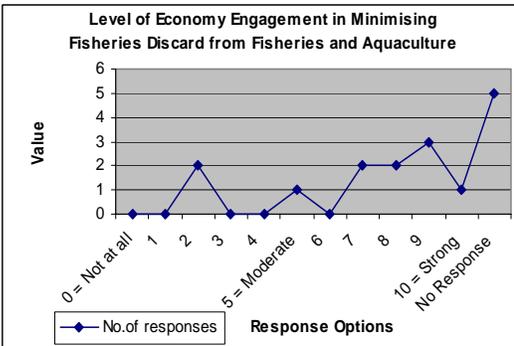
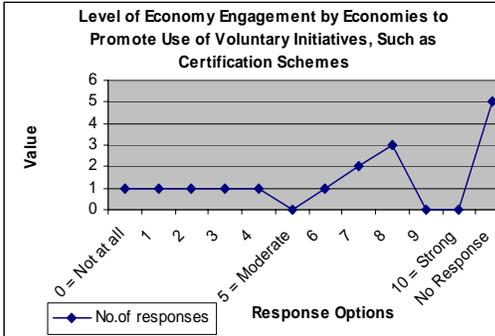
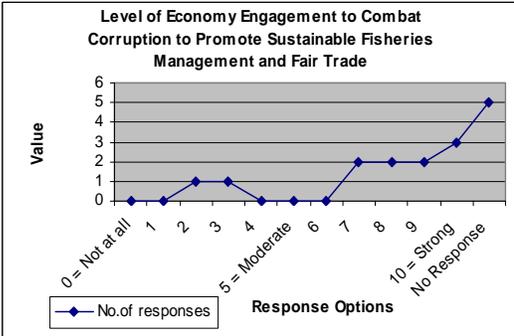
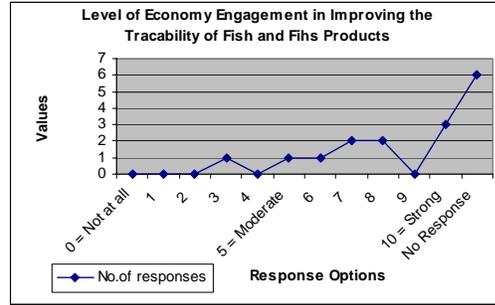
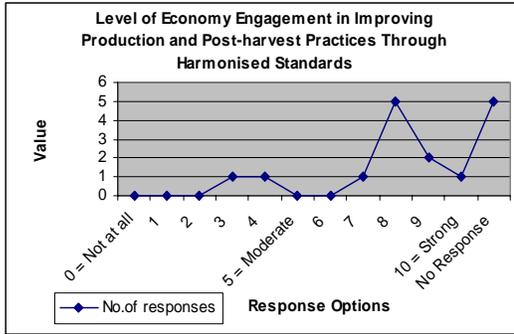
Section Summary

There is a possibility that Economies indicated "improved moderately" as a quantitative response to this question in the absence of an option to indicate that their understanding of the interaction between climate change and fisheries actually only 'improved slightly'. The qualitative comments suggest that very few Economies, all developed, have researched this topic actively. Indeed, the scope for further effort on this important issue is succinctly demonstrated by the alleged reliance of one developing Economy on newspaper reports publicly available publication, which presumably would be unlikely to achieve their specific, localised situation.



Question 39	Relates to BPA Action: II.i, II.ii, II.iii, II.iv, II.v, II.vi, II.vii, II.viii
<p>Please rate the level of engagement of your Economy since September 2005 in the following activities as they relate to maximising value from the use, production and harvesting of resources:</p> <p>a) Improving understanding and management of the impacts of aquaculture on environmental sustainability?</p> <p>b) Securing consumer confidence in aquaculture products?</p> <p>c) Facilitating the sustainable contribution of aquaculture to coastal communities, wild stocks and food security?</p> <p>d) Participating in the launch of the ANA and implementation of its proposed action plan in cooperation with the FAO?</p> <p>e) Improving production and post-harvest practices through harmonised standards?</p> <p>f) Improving the traceability of fish and fish products?</p> <p>g) Combating corruption that undermines sustainable fisheries management and fair trade in fisheries products?</p> <p>h) Promoting the use of voluntary initiatives, such as certification schemes?</p> <p>i) Minimising fisheries discard and wastage from fisheries and aquaculture?</p> <p>j) Combating maritime crimes to ensure the safety of fishing and navigation?</p>	<p>i: Undertake further work to improve understanding of impacts of aquaculture on environmental sustainability, to secure consumer confidence in aquaculture products, an emerging issue domestically and regionally, and to facilitate aquaculture's sustainable contribution to coastal communities, wild stocks and food security.</p> <p>ii: Launch the ANA and implement its proposed Action Plan, in cooperation with the FAO.</p> <p>iii: Improve production and post-harvest practices by harmonising standards to ensure healthy and safe seafood products.</p> <p>iv: Improve traceability of fish and fish products.</p> <p>v: Reduce and eliminate corruption that undermines sustainable fisheries management and fair trade in fisheries products.</p> <p>vi: Promote the use of voluntary initiatives such as certification schemes, consistent with international standards, including FAO eco-labelling standards, as a complement to mandatory measures.</p> <p>vii: Minimise fisheries discard and wastage in order to maximise economic benefits from fisheries and aquaculture.</p> <p>viii: Reduce and eliminate maritime crimes to ensure the maritime safety of fishing and navigation.</p>





Interpretation of Quantitative Data

a-c) A total of 75% of respondent Economies indicated a strong level of activity since September 2005 in improving understanding and management of the impacts of aquaculture on environmental sustainability. A strong majority of Economies also indicated that they have been active in securing consumer confidence in aquaculture products. A similar majority of APEC Economies reported active engagement in the task of facilitating the sustainable contribution of aquaculture to coastal communities, wild stocks and food security.

d) Only four Economies responded to the question on whether they participated in the launch of the ANA and have participated in implementation of its proposed action plan in cooperation with the FAO. Of these, only two reported moderate to strong participation. Eleven Economies observed that the initiative is “not applicable” to them.

e) Half of the participating Member Economies stated that they have been strongly engaged in improving production and post-harvest practices through harmonised standards. However, 30% of economies did not respond to this question, possibly suggesting scope for greater collaboration and awareness building.

f) Although more than half of the respondent Economies indicated that they are active in improving the traceability of fish and fish products, the indicated level of activity was only moderate. Also, almost an equal number of Economies did not respond to this question, suggesting potential for strengthened effort on this Action Item.



g) Most respondent Economies reported a strong level of effort to combat corruption that undermines sustainable fisheries management and fair trade in fisheries products. Nevertheless, almost one third of the Economies that participated in the survey declined to answer this question, once again suggesting potential for strengthened effort on this Action Item.

h) Almost a third of Economies reported strong activity in promoting the use of voluntary initiatives, such as certification schemes. Nearly the same number of respondents indicated below-moderate levels of activity, and the same number again did not respond to the question. This response shows that Economies do not appear to have embraced the use of voluntary schemes as tools for fisheries management.

i) The survey responses reveal overall mixed levels of activity with regard to minimising fisheries discard and wastage in order to maximise economic benefits from fisheries and aquaculture. Also, once again, nearly one third of participating Economies declined to answer this question, which could indicate the need for greater awareness of the issue.

j) A majority of participating Economies responded positively to this question demonstrating strong levels of activity in combating maritime crimes to ensure the safety of fishing and navigation.

Domestic Initiatives

a) One Economy reported completion of State-of-Knowledge review papers that provide details on the current status of scientific information, and identify knowledge gaps and research needs. It also reported completion of a new ecosystem framework in support of integrated management, and completion of a five-year research agenda that focuses on environmental sustainability, aquatic animal health, invasive species and ecosystem assessment. Another Economy stated that it has worked with stakeholders on legislation to provide a regulatory framework for the development of marine aquaculture and that it conducted comprehensive research to this end. That Economy also claimed to have published a plan that aims to develop commercial marine aquaculture and replenish wild stocks; increase public understanding on marine aquaculture; and increase collaboration with international partners.

Another Economy stated that it undertakes adaptive management to ensure sustainability. This was said to include completion of sustainable aquaculture strategies for land-based and marine aquaculture, which link economic development with land-use planning to promote sustainable natural resource management. The strategies reportedly detail essential criteria for the design and operation of aquaculture facilities using best aquaculture practice, identify appropriate aquaculture sites and provide a coordinated management approach. The Economy claimed also to have implemented new licensing conditions, and improved monitoring and assessment protocols. The main challenge in this regard was identified as the need to reach consensus and manage aquaculture environmental impacts through an appropriate monitoring and reporting program. Two Economies stated that they ensure that their fish/shrimp farmers undertake and implement Environmental Impact Assessments (EIA). In addition, one of these two Economies claims to implement quarantine procedures to minimize the harmful effects from the introduction of non-native or genetically modified stocks used for aquaculture.

Three Economies have reported to be implementing Good Aquaculture Practices (GAP). One of the Economies stated that it improves understanding and management of aquaculture impacts through regular farm visits, seminars, and provision of advisory leaflets and guidelines to fish farmers to promote improved culture techniques. Another Economy stated that it conducts selective breeding on species to promote fast growth and to minimize the use of chemicals for disease treatment, and thus reduce environmental pollution. The third Economy claims that it maintains a dialogue with communities on sustainable aquaculture.

A range of initiatives such as review on the ecological effects of finfish aquaculture, shellfish



aquaculture and other species aquaculture, are under progress in one Economy to promote better public understanding on the benefits and effects of aquaculture. That Economy claims also to ensure that applications for new aquaculture sites must be accompanied by full environmental impact assessments. Industry-led development of environmental codes of practice for mussel, oyster and salmon farming is also said to be widely supported.

An Economy cited fish farm purification projects to address the problem of deposited materials under floating fish nets, and prevention of secondary contamination through support for the establishment of facilities to remove dead fish in fish farms. Zonation of aquaculture areas, creation of buffer zones, and implementation of effluent treatment ponds in newly built shrimp farms are examples of measures undertaken by another Economy to manage the impacts of aquaculture. One Economy stated that it promotes development of 'fishing ground improvement plans' by fishermen to conserve and improve aquaculture sites.

Four Economies did not respond.

b) One respondent Economy stated that it has launched a comprehensive new website to distribute information on sustainable aquaculture. It is also in the process of developing a program to inform selected leaders in the seafood value chain about efforts in fostering a sustainable aquaculture industry, and to provide them with appropriate multi-media materials. Another Economy stated that it provides a subsidy for an education program to distribute accurate information on aquaculture products to consumers.

An Economy reported that it launched an 'Accredited Fish Farm Scheme' in 2005 to maximise production of safe aquaculture products. This scheme consists of a two-level auditing quality assurance system involving regular farm-level monitoring and pre-market product monitoring. The use of farm accreditation to secure consumer confidence was also reported by another Economy. A series of initiatives was cited by an Economy including implementation of a Code of Conduct (CoC) and Good Aquaculture Practices (GAP); registration of farms; and issuance of movement documents, while another Economy said that it works on a range on initiatives related to marketing, branding and eco-certification for the same purpose. This latter Economy has also approved the expenditure of \$6.5 million to assist the aquaculture industry with market development through boosting consumer confidence, securing and maintaining market position and identifying new market demand. Relevant government departments of that Economy work closely with the aquaculture industry to develop national standards and achieve eco-certification for the industry. Similarly, two government departments of another Economy have also been reported to work closely with stakeholders to promote the benefits of aquaculture production, and to support a detailed shellfish program that requires strict assessment of waterways and on-going water and meat testing for pollutants. This Economy noted that the greatest challenges faced are reducing reliance of the finfish industry on use of antibiotics, and developing a good communication strategy while increasing production and building consumer confidence.

The most significant obstacle faced, according to one Economy, is overcoming misleading consumer perceptions on the safety and environmental impacts of aquaculture products. That Economy aims to provide accurate science-based information to the public to address this issue. Stringent checks were reported by another Economy in order to monitor the use of feeds and chemicals such that they comply with good farming practices. The environmental agency of that Economy was also said to perform strict governance on environmental protection to ensure the safety and cleanliness of seawater for aquaculture production. Efforts were also reported to ensure that the farmers are experienced in fish packaging and transportation in order to supply fresh fish to the market.

Yet another Economy mentioned its on-going efforts to meet zero tolerance on antibiotics for shrimp production. It also stated that it conducts voluntary traceability actions based on the existing HACCP regulations. Limitation on drug injection to aquaculture species was cited by another Economy.

Five Economies did not provide a response.



c) One Economy whose aquaculture sector is managed jointly by federal and provincial authorities stated that discussions with the provinces through an aquaculture task group have made significant inroads into the development of a new framework for the governance of aquaculture, which includes enhancement of economic prosperity for rural coastal communities. Another Economy stated that it has designated a permanent commission to advise the fishing community on matters relevant to aquaculture. It is also reportedly in the process of formulating a project that aims to promote the use of monitoring reports for aquaculturists.

An Economy cited the publication of a document that outlines its commitment to support industries and communities related to aquaculture. It also allocated a position for indigenous people in a newly formed stakeholder body for the industry development. This Economy claimed to have set up a \$2 million contestable fund to support regional councils in their aquaculture planning and information gathering. It further claimed to have a range of enhancement programs for aquaculture and a world-leading water quality program to ensure the safety of aquaculture products.

Population shift to coastal areas was reported to have increased the pressure on marine resources including sites that are suitable for aquaculture in one Economy. Accordingly, suitable land-based aquaculture locations were said to have been mapped with the help of sustainable aquaculture strategies. A similar mapping exercise was also said to have been done for oyster leases to identify them in legislation as priority oyster aquaculture areas, in order to secure them for future generations. This Economy reported that it has no restocking program for marine waters to supplement wild stock, but three million fish are released annually into inland waters to support recreational fishing. It also said that it has approved new funding for aquaculture development and that government departments are actively engaged in identifying sites and appropriate production systems for future large-scale aquaculture. However, it noted that transfer of the requisite technology, establishment of pilot farms and securement of necessary investment might prove to be obstacles. This Economy also reported unprecedented growth in its salmonid marine farming industry with the help of its marine farming planning process.

An Economy reported that it carries out adaptive development studies to improve productivity and enhance sustainability of its aquaculture industry. This was said to include efforts to identify new culture species with good market potential for extension to farmers; and promote artificially propagated species culture to fishermen. Another Economy responded that it has provided training to analysts working in fisheries quality assurance labs. It reported that it has also been conducting capacity building programs with SMEs on post-harvest handling and marketing.

A novel response observed that the floating cages and rafts in its offshore fish farms act as fish habitat and enhance the abundance of fish. That Economy also noted that its coastal waters are suitable for aquaculture and that it encourages regional players to co-invest with local farmers. Promotion of the development of 'fishing ground improvement plans' by fishermen was cited by an Economy to conserve and improve aquaculture sites, which in turn contribute to food security and the sustainability of coastal communities and wild stocks.

The greatest challenge according to one Economy, lies in obtaining a common understanding among stakeholders in coastal communities on the economic, social and environmental contributions of aquaculture.

Four Economies did not provide a response.

d) One Economy reported that it aims to achieve sustainable aquaculture production through implementation of biosecurity procedures, but no Economy specifically elaborated on their participation in ANA.

One Economy did not respond, and another indicated that it has not participated in the ANA initiative.



Eleven Economies responded that ANA is 'not applicable' to them.

e) An Economy reported that it has improved post-harvest practices through a quality management program, which is a regulatory-based system that requires all federally registered fish processing plants in the Economy to develop and implement in-plant quality control procedures. This Economy, along with two others, reported the use of HACCP principles to provide a high level of assurance on the safety of fish and fish products. It also stated that significant progress has been made at the provincial level in developing standards, e.g. Codes of Containment exist in most marine coastal provinces. The industry associations in its provinces were said to have developed Codes of Practice to improve production and post-harvest handling. Reportedly, there have also been discussions at the national level to examine the potential for an overarching national code system. A similar response was obtained from another Economy, which stated that it improves production practices through development of the industry codes of practice that are consistent with the principles of ecologically sustainable development. It also reported the development of best management standards as Aquaculture Industry Development Plans, with a strong focus on the development of enterprise or industry level Environmental Management Systems (EMS). The National Fisheries Institute of an Economy reportedly has been tasked to manage the quality and hygiene control of fish and fishery products through regular inspections on production and processing facilities.

Another Economy responded that its Accredited Fish Farm Scheme aims to enhance operation and production standards of aquaculture. This scheme was reported to involve routine inspection of fish farm hygiene, fish health, culture management records and water quality. A similar program was established in another Economy to ensure that fish are caught from safe and non-polluted areas. Analysis to detect the presence of bacteria, histamine, heavy metals, and pesticides were said to be conducted under this program. One Economy reported that it works with Codex and ISO bodies on food safety and quality issues. It noted the harmonisation of the political realities to formulate laws and regulations consistent with policy priorities as the main challenge faced. A single Economy indicated that its aquaculture sector already practises good farming principles, and good post-harvest and handling procedures.

With regard to harmonising practices, an Economy reported that it is formulating a project to standardize and systemize the production processes of high-value aquaculture species. It claimed to have developed technical documents on preservation systems that reduce on-board quality loss. All processing plants in this Economy were said to have quality assurance programs. Another Economy is reported to be in the process of preparing several technical regulations to meet international standards, such as zero tolerance, HACCP and eco-labelling.

Five Economies did not respond.

f) Traceability issues are addressed by one member Economy through a quality management program that requires all federally registered fish processing plants to develop and implement in-plant quality control procedures. In order to become federally registered, a fish processor is required to develop a quality management program plan based on HACCP. The Economy noted that there are no current programs to enhance the traceability of fish with regard to aquaculture. The use of HACCP in processing and labelling of fish and fish products was also reported to have been implemented by another Economy.

An Economy stated that it is drafting new food safety legislation to enhance safe food consumption and improve the traceability of fish and fish products. Another Economy stated that it secures consumer confidence in aquaculture products through implementation of Code of Conduct (CoC) and Good Aquaculture Practices (GAP); registration of farms; and issuance of movement documents.

In order to monitor health issues relating to fish and fish products, one Economy claimed to have taken up a lead role in the inspection and control of fisheries and aquaculture activities. This was said to be done through the development of a national sanitary authority, which aims



to create permanent traceability in the seafood supply chain. The existing sanitary legislation of this Economy also requires the adoption of HACCP, which implies the maintenance of a recording system for traceability actions. Another Economy reported that it ensures that certification is applied to all fish and fish products in order to improve traceability, while yet another reported that it has prepared accurate methods to be practised by exporting companies

One Economy noted that the challenge is not necessarily the traceability between countries but rather the traceability along the food chain due to denaturation of ingredients. Tests on the robustness and reliability of a genetic traceability system for fish developed by a Norwegian company are reportedly being undertaken in an Economy. If proven successful, this system may be utilized to ensure reliable authentication of traceability. A basic plan for a seafood traceability system was established by another Economy in 2004, which was said to have been implemented in three phases.

Six Economies did not respond.

g) An Economy reported having a fish marketing organisation to ensure orderly marketing of fresh marine fish and to provide a fair trade platform. It also claimed to undertake enforcement actions against illegal marine fish marketing. Two Economies responded that good governance and strict enforcement of law keeps corruption at bay. Citizens were said to be encouraged to comply with rules and regulations that are designed to facilitate trade and business. Similarly, two other Economies reported undertaking official surveillance and control of fishery and aquaculture activities, and one of these Economies highlighted the importance of international cooperation in combating the problem. One Economy stated that it has limited capacity with regard to this matter.

Five Economies did not provide a response.

h) An Economy reported that it participates in catch documentation schemes through its dockside monitoring program, which ensures that landed fish are weighed and that catch reports are verified against landings. The Economy is also reportedly facilitates the Marine Stewardship Council (MSC) accreditation for some of its fisheries. Another Economy stated that it plays a proactive role in promoting an Accredited Fish Farm Scheme and the branding of local aquaculture products. A similar aquaculture farm certification scheme is practised in another Economy, where farms are audited by relevant government departments and given a certificate that is valid for two years. Seminars and workshops were said to have been conducted actively to create awareness among farmers on the importance of GAP in food production.

An Economy stated that its relevant ministry is initiating a program to work with the seafood sector to demonstrate the environmental integrity of its seafood through attainment of environmental certification of particular fisheries or farms. The program aims to evaluate the current management standards against internationally recognized standards for the sustainable management of aquatic seafood production; and establish a contestable fund to assist industries that seek to certify their fisheries. The FAO guidelines for eco-labelling will be used to determine the credibility of any certification program. The Economy also stated that compliance with the ISEAL Code of Good Practice for Setting Social and Environmental Standards is also considered. This Economy has obtained MSC certification for one fishery.

Another Economy reported a similar approach in promoting the use of certification schemes. It claims to have encouraged its seafood industries to develop environmental monitoring systems (EMS) that improve and demonstrate their environmental performance. The EMS can be used as a component of certification schemes. Apart from that, two of its fisheries are certified under the MSC, while others have ISO Environmental Management Certification. This Economy noted its concern that eco-labelling may be used as technical barrier to trade, where the adoption of eco-labelling systems in marine capture fisheries could have a big impact upon developing countries due to prohibitive compliance costs and a lack of technical capability in setting up and administering certification systems.



One Economy reported that it does not necessarily promote voluntary labelling initiatives, but was active in the elaboration of the FAO eco-labelling guidelines, and supports their use. The Economy has also launched a 'fish watch' program, to help the community identify the status of fishery stocks, and understand the requirements involved in maintaining sustainable fisheries. A GAP Scheme for coastal fish farming was said to have been drafted in one Economy. Another Economy noted that it has yet to establish a policy to promote eco-labelling, while yet another stated that it is currently undertaking studies on the establishment of a certification system for fish and fish products. An Economy that has obtained 'dolphin-free tuna' certification mentioned that it will seek to have more labels consistent with FAO standards, while another respondent Economy said that it ensures that certification is applied to all fish and fish products.

Five Economies did not respond.

i) An Economy stated that it is engaged in on-going efforts to develop and implement strategies to minimize incidental catches through various management measures including limits on by-catch, improved selective fishing practices and changes to gear technology. It also claims to have implemented by-catch initiatives for certain fishery species along its coast. The Economy noted that its current best management practices meet or exceed federal and provincial regulations with regard to waste management. Through an R&D program, the Economy has conducted research that directly influences feed management and waste production.

One member Economy stated that it has released a publication to address by-catch and discards in fisheries, and said that it is discussing the operationalisation of this policy intent with industry. It claims currently to be developing work plans in a number of fisheries. This Economy also said that it promotes the use of recyclable technology in aquaculture, and where appropriate, practises waste-water recycling. It noted that future challenges will be to ensure the consistency and rationality of monitoring requirements; and to ensure that the data generated will be used to improve waste management practices.

An Economy reported that it supports the development of environmentally friendly feeds, and technology to reduce residual feeds, e.g. from automated feeders, while research was reported by another Economy on different techniques of waste processing in order to maximize economic benefits. In this regard, one Economy has taken up steps in waste minimisation, such as recycling oyster shells to assist the growth of seedling, and extracting collagen and peptide from scales and oyster shells to produce skin-care products. Another new approach taken by an Economy to minimize fisheries discards is the introduction of a juvenile trash excluder device, along with mandatory implementation of mesh size of 38mm for cod end trawl nets.

Two Economies stated that fisheries discards and wastage is uncommon in their fisheries, while two other Economies reported that it is illegal to discard fish that are unlikely to survive, and that such activities are prosecuted under its fisheries legislation. One of the two Economies stated that by-catch products are used by fishmeal factories.

Five Economies did not provide a response.

j) Two Economies reported implementation of the International Ship and Port Facility Security (ISPS) Code. One Economy reported that its maritime security measures focus on better protection of marine infrastructure, security of ports and watersides, container security, and domain awareness. It also stated that its Marine Security Program funds up to 75% of the cost of modernizing and strengthening security systems and programs in its ports and marine facilities, to meet the ISPS Code. The Economy's security clearance program was said to further enhance port security through background checks on marine workers with access to sensitive or secure areas at dock facilities. The other Economy stated that it has established a national centre to coordinate maritime-related matters.

One Economy reported that its efforts in countering illegal foreign fishing vessels in its waters have significantly reduced the problem in its EEZ over the last two years. Increase in



surveillance coverage has also increased the apprehension rate of foreign fishing vessels. The Economy continues border protection operations in order to provide on-going strong deterrence to potential threats from illegal foreign fishing.

Four Economies declared that its police force, together with relevant government departments, are taking active measures in combating maritime crimes, including destructive fishing practices. One of these Economies imposed mandatory use of Emergency Position Indication Radio Beacon in vessels larger than 24m, starting from September 2009. It has also been developing a centre to consolidate all relevant VMS-based systems into a single system to enhance safety of vessels.

Four Economies did not respond.

One Economy commented that the issue is not really applicable to it.

Regional Initiatives

No qualitative elaboration was offered on Parts a,b,c,e,h or i on regional initiatives.

d) One Economy reported that it actively participates in SEAFDEC's Aquaculture Programme. Another Economy stated that it is a contributing member to the Network of Aquaculture Centres in Asia (NACA).

f) An Economy cited its involvement in an APEC project on traceability.

g) One respondent Economy stated that it has actively participated in the implementation of a 'Single Window' Policy in the ASEAN region with the intention to cut the red-tape bureaucratic system and to simplify the custom/clearance processes for export and import procedures.

j) Two Economies stated that they combat pirate attacks in a joint effort with other member Economies in the region.

Relevant International Initiatives

No qualitative elaboration was offered on Parts a,b,c,g or i on international initiatives.

d) An Economy reported that it has allocated time and resources to monitor the implementation of the ANA, and is engaged with a leading Economy to help facilitate development of the organisation. It noted that the challenge lies in building consensus among participants on the scope and directions of this organisation. Another Economy responded that, as the project coordinator, it has been actively involved in the preparations for the launch of ANA and has provided support/input to the contractor in all aspects of the Network.

One Economy stated that it has supported the development of ANA, and activated the Aquaculture Investigation Fund for financing of the respective economic contribution.

e) One Economy stated that it actively supports the harmonisation of standards for post harvest practices through participation in a number of international fora, including CODEX Alimentarius Commission and the Office Internationale des Epizooties (the World Animal Health Organization). Another Economy reported that it has conducted harmonisation programs in joint efforts with other countries.

f) An Economy reported that it has actively improved and promoted the traceability of fish and fish products through participation in international fora such as: the CODEX Alimentarius Commission; the Office Internationale des Epizooties (the World Animal Health Organization); Biosafety Protocol; and the Organisation for Economic Cooperation and Development.

h) One Economy reported that it is engaged in international discussions with FAO and RFMOs to raise awareness on certification systems. It claims also to have been actively engaged in FAO aquaculture discussions and to play a role in efforts to develop certification



guidelines for aquaculture products and processes. This Economy also stated that it participates in the development of aquaculture standards through the International Standards Organization; and in dialogue processes with WWF to develop standards for aquaculture products.

j) An Economy stated that it will be chairing a session on maritime safety in June 2008 at the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea.

Discussion of Organisational Perspective (from the Survey of Organisations)

The majority of organisational involvement was observed at the regional level, where a number of collaborative efforts were evident. In general only a few organisations reported activities that reflect a broader international approach.

a) However, overall, the reported level of organisational involvement in improving understanding and management of the potential impacts of aquaculture on environmental sustainability is low. One NGO indicated a need for improvements in monitoring measures in order for efforts to be effective.

b) Efforts by respondent organisations towards providing assistance or programs to secure consumer confidence in aquaculture products were limited, with specific elaboration by two organisations indicating activity at both the domestic and regional levels (i.e. promotion of Good Aquaculture Practices, Guidelines for Aquaculture Certification, Principles for Responsible Shrimp Aquaculture, Better Management Practices for Aquaculture, Training and Capacity Building etc).

c) Domestic level initiatives reported as relevant to facilitating the sustainable contribution of aquaculture for coastal communities, wild stocks and food security was minimal. One NGO indicated meeting this matter through mangrove planting. One IGO observed undertaking ICM project work of direct benefit to Economies. While another IGO reported a work program that primarily benefits non-APEC Economies.

d) Participation in the ANA was not indicated, although two IGOs stated that they had participated in NACA. As the ANA had not yet to become operational, the limited response to this question was expected.

e) Reported Organisation involvement in improving production and post-harvest practices through harmonised standards was low, although efforts at the regional level appear to have resulted in positive outcomes for APEC Members and the Asia Pacific Region in general.

f) Initiatives relevant to improving fish traceability in the Asia Pacific Region were indicated by respondent organisations at all levels (domestic, regional and international). One reported activity at the domestic level (development of a computer-based program), may hold practical applicability for APEC Economies, particularly those Economies where traceability may be of most benefit towards enhancing international trade. Regionally applied initiatives and actions for improving traceability of fish products were limited, where one RFMO indicated a resolution on statistical documentation and one IGO indicated collaborative activity specifically for aquarium fish. Interestingly, one IGO involved in fisheries reported that they have not been requested by member to do work in this area. A noteworthy activity where economic and ecological benefits may be achieved by APEC Economies was through the internationally promoted sustainable fisheries certification program. The NGO undertaking this program observed that there is now increasing demand for certification in order to enter or comply with some market requirements. This NGO also reported the provision of a chain-of-custody initiative.

g) Overall, organisational involvement in combating hindrances to sustainable fisheries management was minimal. One NGO reported that the identification of hindrances to sustainability and the identification of solutions was an integral part of the sustainable



fisheries certification that they offer, while an IGO reported a similar although slightly more generic response.

h) The rate at which organisations indicated promotion of voluntary initiatives such as certification schemes was moderate. One IGO said that it undertook relevant action in aquaculture development, while another indicated the development of an ICM code towards developing an international standard for voluntary use for ICM certification. Once again one NGO cited meeting the objective (at least in part), through the sustainable fisheries certification program, where voluntary mechanisms are promoted.

i) Reported Organisation participation in activities to minimise fisheries discard and wastage was limited. Opportunities for APEC to improve efforts may be realised on at least one front; where one RFMO indicated unimplemented provisions in their founding convention where it stated that action will be required “at some stage”. An NGO indicated that the issue of fisheries discard was an area addressed in the sustainable fisheries certification program which appears to have gained some momentum in recent years.

j) Assisting in mechanisms to combat maritime crimes was reported to be an area of low participation by these organisations.

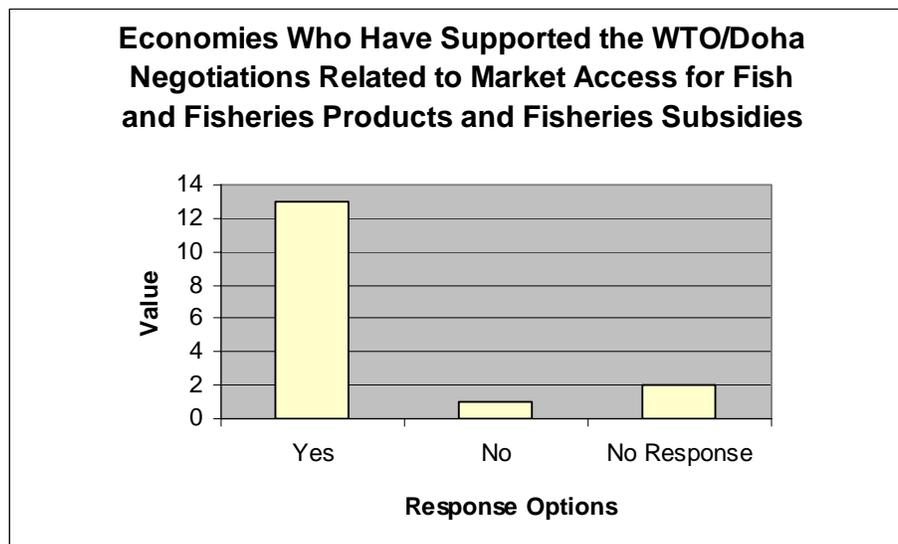
Section Summary

Question 39 is a ten-part question of considerable breadth. Whilst each part explores an aspect of the common theme of aquaculture, they allow also for quite different indication of emphasis in effort. Nevertheless, the main thrust of the question relates to aquaculture management (i.e. Parts d,f,g and j.) and marketing (i.e. Parts b,e and h). Environmental impact is explored in Parts a and I, and economic contribution is considered in Part c.

With the exception of Economy participation in the ANA initiative, which the majority of Economies did not believe was applicable to them, there were consistently active reports of initiatives and effort for each of the other areas explored by the question. Few Economies offered qualitative elaboration of initiatives taken to combat corruption in fisheries, reflecting perhaps the sensitive nature of this issue.



Question 40	Relates to BPA Action: II.ix
Has your Economy supported the WTO/Doha negotiations, in particular those related to market access for fish and fisheries products, and fisheries subsidies?	Support the WTO/Doha negotiations, including those related to market access for fish and fishery products, and fisheries subsidies.



Interpretation of Quantitative Data

An overwhelmingly positive response to this question furnishes strong evidence that the respondent Economies have been active in their support of the WTO/Doha negotiations, in particular those related to market access for fish and fisheries products, and fisheries subsidies. Only three Economies either did not respond or did not indicate any related activity.

Domestic Initiatives

One respondent Economy reported that it actively works with relevant domestic agencies/departments in providing input in NAMA negotiations. It aims to increase transparency and predictability by supporting NAMA modalities that provide flexibilities for developing countries. Another Economy said that it participates in the negotiations on fishing subsidies within WTO through its inter-sector ministries and departments. It reported that its current legislation is harmonised with the provisions of *Codex Alimentarius*, and that it is continuously harmonising with the legislation of other countries with which it maintains trade.

Regional Initiatives

One Economy reported that it has provided \$9M under the APEC-WTO Capacity Building Initiative Economic Integration Program to assist in capacity building of government agencies and departments in four APEC Economies in Southeast Asia (i.e. Vietnam, Thailand, Indonesia and Philippines) in order for them to function effectively in WTO to meet their obligations under WTO agreements, and facilitate regional and global trading relations.

Relevant International Initiatives

Four Economies reported active participation in NAMA Negotiations on market access. One respondent Economy was noted to have participated in the WTO Negotiations on Fisheries Subsidies (27-28 March 2007) and NG Rules Meeting (24-26 September 2007), held in Geneva, Switzerland. An Economy stated that besides participation in WTO/DOHA



Negotiation meetings, it has also submitted a proposed legal text on fisheries subsidies.

Three other Economies also reported that they are active participants in WTO/DOHA Negotiations in relation to both fisheries subsidies and market access, where one Economy claimed that it supports substantial and early reduction of tariffs and non-tariff barriers to achieve significant market access through participation in sectoral initiatives for fish and fisheries products.

In an effort to liberalise trade in specific categories of goods, five Economies reported that they support and co-sponsor the “Fish and Fish Products Sectoral” proposal, on which negotiations are still ongoing at the WTO.

One Economy that is fully engaged in all WTO/DOHA negotiations noted that it has emphasised the need to focus on subsidies that contributes directly to fishing vessel overcapacity. It also highlighted that disciplines should apply equally to developing countries, many of which are significant participants in the world fisheries sector.

A respondent Economy observed that the fishing sector is not large and influential compared to other sectors, thus fishing sector priorities can be overshadowed by larger sectors of the Economy in multilateral negotiations. Another Economy reported that it does not subsidise fishing activities, and has been an active participant in the WTO Rules Negotiating Group’s work on clarifying and improving disciplines on fisheries subsidies.

One Economy that responded ‘yes’, did not elaborate on the type of support provided.

Two Economies did not provide a response.

Discussion of Organisational Perspective (from the Survey of Organisations)

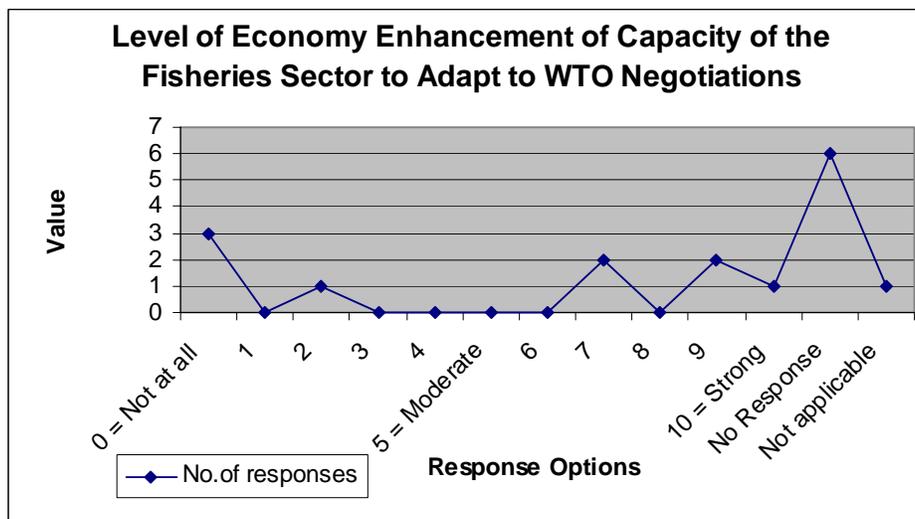
None reported.

Section Summary

Although the WTO/Doha negotiations have proven to be awkward for the participating States, the survey response shows that APEC Economies are strongly committed to improving market access for fish and fish products through this mechanism. However, the qualitative elaboration suggests that most Economies focus more on the issue of market access than they do on fisheries subsidies.



Question 41	Relates to BPA Action: II.x
Since September 2005, to what extent has your Economy enhanced the capacity of the fisheries sector to adapt to the results of WTO negotiations?	Build the capacity of the fisheries sector of APEC Economies as a matter of highest priority, to adapt to the results of WTO negotiations.



Interpretation of Quantitative Data

Out of the sixteen Member Economies, almost half of the respondent Economies did not respond to the question on the enhanced capacity of the fisheries sector to adapt to the results of WTO negotiations. A further quarter indicated that no initiatives in this regard have been taken or that the issue is not applicable. Only about a quarter of the respondent Economies rated the level of their activity as moderate to strong, which suggests scope for greater collaboration and possibly awareness building on this Action Item.

Domestic Initiatives

Four Economies reported that they do not follow WTO negotiations as a standard or guideline for fisheries subsidies due to the fact that no agreements have been reached so far. One Economy reported that it has small fishing capacity, thus it imports food including fish from countries worldwide. Another Economy responded that it has adopted its own fisheries policy on sustainable use of fisheries resources.

One respondent Economy stated that it is in the process of implementing the Technical Barrier to Trade (TBT) and Sanitary and Phytosanitary (SPS) Agreements. It has also implemented the application of traceability for all fishery products according to the international standards. Another Economy established policies to assist its fisheries and fisheries communities, and is carrying out studies on reforming the subsidiary system. A developing Economy reported that it has made effort to harmonise its health legislation with other Economies of the APEC.

Although not directly involved in the WTO negotiations, an Economy reported that it attentively follows updates on the negotiations on fisheries subsidies and provides continuous input on trade facilitation to its focal agency. Another Economy that is a significant participant in the fisheries sector has reported that it operates an open market Economy with low domestic industry subsidisation. It noted that it has only one binding tariff on seafood imports and has no import quotas for seafood products. Five Economies did not provide a response on successes or challenges met.

**Regional Initiatives**

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

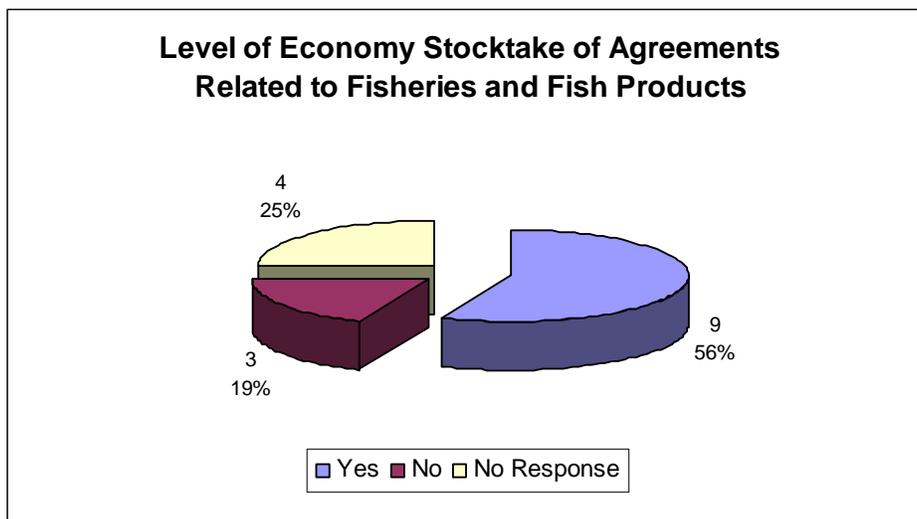
Organisation responses did not reflect activity in this area, suggesting that the issues of free trade agreements and cooperative arrangements are driven primarily by Economies.

Section Summary

Very few APEC Economies indicated that they have taken measures to prepare their fisheries sector for possible impacts arising from the outcome of WTO/Doha negotiations. A significant number of Economies suggested that they are waiting to see if an agreement is reached. Such a position probably reflects both a degree of caution over the likely success of the negotiations combined with awareness of the sensitivity of any cuts in domestic fisheries subsidies.



Question 42	Relates to BPA Action: II.xi
Since September 2005, has your Economy undertaken a stock-take of existing commitments regarding fisheries and fish products in free-trade agreements and regional Asia-Pacific trade agreements or related cooperative agreements?	Undertake stocktaking of existing commitments regarding fisheries and fish products in free-trade agreements and regional trade agreements in the Asia-Pacific region and related cooperative agreements to complement broader APEC Review efforts overall.



Interpretation of Quantitative Data

The quantitative data demonstrates that a majority of the respondent Economies have undertaken a stock-take of existing commitments regarding fisheries and fish products in free-trade agreements and regional Asia-Pacific trade agreements or related cooperative agreements since 2005. Only three Economies reported that they have not done a stock-take, and four Member Economies did not respond.

Domestic Initiatives

None reported.

Regional Initiatives

One Economy that is a member of the WTO reported to have concluded bilateral free trade agreements (FTAs) with four other Economies. It is currently negotiating additional bilateral free trade agreements with six other parties, and conducting pre-FTA feasibility studies with a number of countries. Another Economy responded that it is committed to free-trade agreements on Closer Economic Relations, Trans-Pacific Strategic Economic Partnership, and two Closer Economic Partnerships. One Economy stated commitments to two Free Trade Agreements and One Economic Partnership Agreement, while another Economy noted its commitments to an Economic Partnership Agreement and ASEAN Free Trade Agreement.

A respondent Economy stated that it is currently negotiating free-trade agreements with two other APEC Economies and will be seeking further FTAs in the region. One Economy is committed to three FTAs, and is in the process of negotiating agreements with other countries. It is currently undertaking a joint study with its business and academic circles on FTA preparatory works with another Economy and has also agreed to ratify the Asia-Pacific trade agreement in June 2007, which will go into effect soon. One Economy simply stated that it would comply with the agreements that it reaches with other Economies/countries, while another Economy cited five FTAs that it is committed to, including AFTA.



One Economy noted that it has agreed to eliminate tariffs on all goods in the FTAs to which it has committed, and provided a source where all of its FTAs are listed. Similarly, another Economy also provided a source where a full list of products, including certain fish and other aquatic products covered by its tariff codes is available.
Four Economies did not provide any response.

One Economy responded 'no' and declared that the question is not applicable.

Three Economies responded 'no'.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

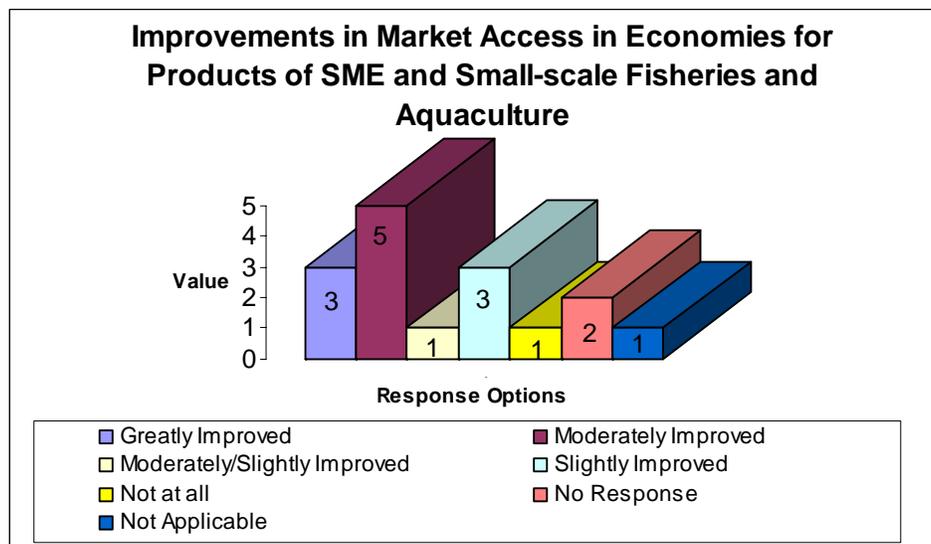
This is not an area in which non-government organisation reflected that they are active. Indeed, 88% of participating organisations declined to answer a question on this topic.

Section Summary

This question explored the extent to which Economies have undertaken a stocktake of their existing fisheries commitments under free-trade agreements. Such a stocktake inherently has a domestic dimension because any such commitments, and particularly the cumulative impact of these commitments, will vary amongst Economies depending on the array of international instruments to which they are a party or have voluntarily committed. However, remarkably, although nine Economies indicated that they have undertaken such a stocktake, none provided any examples or elaboration on initiatives taken at the domestic level. Such a result suggests that Economies may have assessed FTAs on a case-by-case basis but may yet to have examined fully the combined domestic impact of FTA commitments.



Question 43	Relates to BPA Action: II.xii
<p>Please indicate the extent to which market access in your Economy has improved since September 2005 for the products of small and medium enterprises (SMEs), and small-scale fisheries and aquaculture:</p> <p>a) Greatly b) Moderately c) Slightly d) Not at all</p>	<p>Enable greater market access for the products of small and medium enterprises (SMEs), small-scale fisheries and aquaculture.</p>



Interpretation of Quantitative Data

The quantitative data (half of the Economies reported moderate or greatly improved access) demonstrates a significant enhancement of market access for the products of small and medium enterprises (SMEs), and small-scale fisheries and aquaculture in the respondent Economies.

Domestic Initiatives

One Economy stated that it operates an open market Economy with low domestic industry subsidisation. It noted that it has only one binding tariff on seafood imports and no import quotas for seafood products.

Two Economies observed that their market access to the EU has improved since September 2005, and one Economy cited programs such as a Trade Support Program with another APEC Economy to increase capacity building and provide technical assistance to its SMEs. An Economy noted that there is no limitation for products from its small-scale fisheries and aquaculture on access to markets. Another Economy noted that, in order to generate income for poor fishermen, it is currently addressing field-oriented problems through cooperation between supervisory bodies and fishermen; providing support for efficient administration and management through provision of business education; and providing income analysis services for each aquaculture product.

An Economy reported that its existing sanitary legislation promotes the implementation of Good Manufacturing Practices (GMP) for the processing of fish products by SMEs in order to encourage their integration in international trade. This was said to have increased the export



of aquaculture products and small-scale fishery products, and generated new medium enterprises involved in the export of fish products. Another Economy noted that its market access to other countries also improved due to aggressive expansion by companies coupled with new innovations to cater to different markets.

One Economy stated that its relevant federal government agency has provided funding to SMEs for numerous fisheries and aquaculture-related projects. Another Economy responded that it has taken a number of initiatives, such as research to improve the quality of products; promote the concept of one product for one district; and develop variation in products to suit local needs.

An Economy stated that it has seen some improvements pursuant to FTAs to which it has committed since September 2005, which it notes were not necessarily a consequence of WTO negotiations.

One Economy responded that this question is 'not applicable' because its market access has already reached a mature stage.

Two Economies did not provide a response.

Regional Initiatives

An Economy reported that its tariffs on fish and fish products are already low and that it does not apply import quotas to fish and fish products. Preferential tariff rates of 5% or less are granted to developing countries, with the rates otherwise being 6.5% or less. This Economy noted that it has not unilaterally reduced the Most Favoured Nation (MFN) tariffs on fish since September 2005. Also, the Economy observed that it made imports from another Economy duty-free earlier in 2005 as part of a Closer Economic Partnership with that Economy. It reportedly also removed tariffs on imports from two other Economies as part of the Trans-Pacific Strategic Economic Partnership. Another Economy declared that it has consistently maintained zero tariffs on all its imports, including the products of SMEs and small-scale fisheries and aquaculture industries.

Relevant International Initiatives

One Economy observed that its International Program on agriculture and food is a key element of its international strategy. This program was said to have been designed to support the Economy's agriculture and food industry by helping to build long-term international strategies that ensure that the industry is well-positioned to succeed in key markets.

Discussion of Organisational Perspective (from the Survey of Organisations)

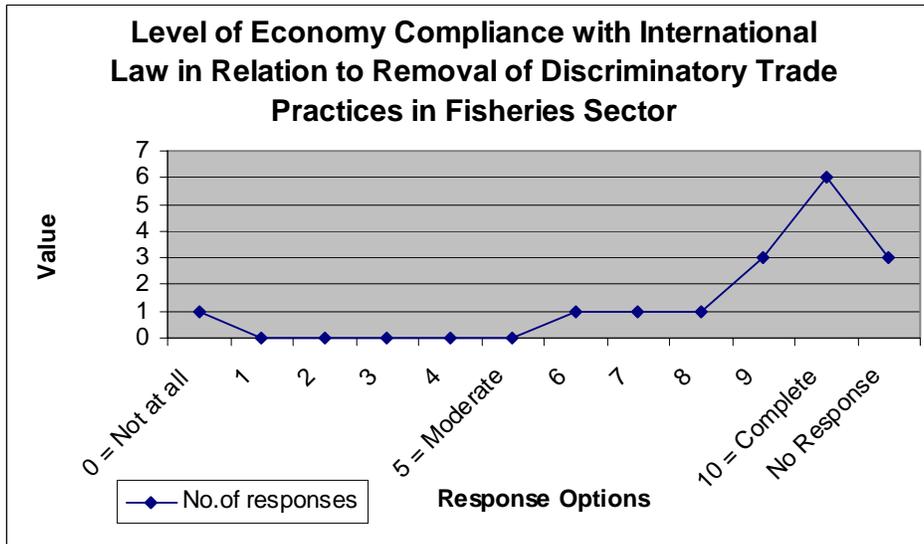
Almost none of the participating Organisations chose to answer a survey question on this topic suggesting that it is seen primarily as a matter for government.

Section Summary

This question explored the issue of market access for SMEs, and small-scale fisheries and aquaculture. There are many factors that can affect market access, including: price competitiveness, product quality versus consumer expectations, packaging quality, access to logistics, access to trade finance, access to market intelligence, and more. However, in the qualitative comments, the main factor discussed by the participating Economies was import tariffs, which relates to only one of the factors listed above, i.e. price competitiveness. Such a narrow treatment of the topic may betray an overly simplistic approach to market access for SMEs, and could indicate the need to further education and effort in this area of BPA implementation.



Question 44	Relates to BPA Action: II.xiii
Please indicate the degree to which your Economy has taken steps to comply with international law by removing discriminatory practices that obstruct the trade of fish and fish products.	In accordance with international law, avoid the use of discriminatory practices and obstacles to trade for fish and fish products.



Interpretation of Quantitative Data
 The respondent Economies reported significant success with regard to compliance with international law by removing discriminatory practices that obstruct the trade of fish and fish products. However, three Economies declined to respond to this question, and one reported that it has taken no steps in this regard at all.

Domestic Initiatives
 One Economy stated that it operates an open market Economy with low domestic industry subsidisation. It claims to have only one binding tariff on seafood imports and no import quotas for seafood products. Another Economy noted its reduction of tariffs on fish and fisheries products, and stated that it is reviewing the import licensing system applied to products imported into the Economy. Yet another Economy reported that it has lowered duty rates through an enlargement of duty concessions.

Three Economies declared that they have no discriminatory practices to obstruct the trade of fish and fish products, and one of these Economies noted environmental-related trade measures as the major challenges (besides stringent SPS requirements) by some importing countries. An Economy emphasised that all food imports must comply with international standards and meet AVA’s requirements on food safety. Another Economy responded similarly, stating that there are no restrictions for trade of fish or fish products in that Economy as long as national sanitary standards are met.

Two other Economies reported that they have either taken the necessary steps to ensure that their regulatory framework is fully compliant with rights and obligations under the various WTO arguments, or have performed harmonisation on import tariffs for 2007-2008.

Seven Economies did not provide elaboration on successes or challenges met.



Regional Initiatives

Besides harmonisation on import tariff for 2007-2008, one Economy reported that it has signed a Mutual Recognition Admission (MRA) with four other Economies.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)
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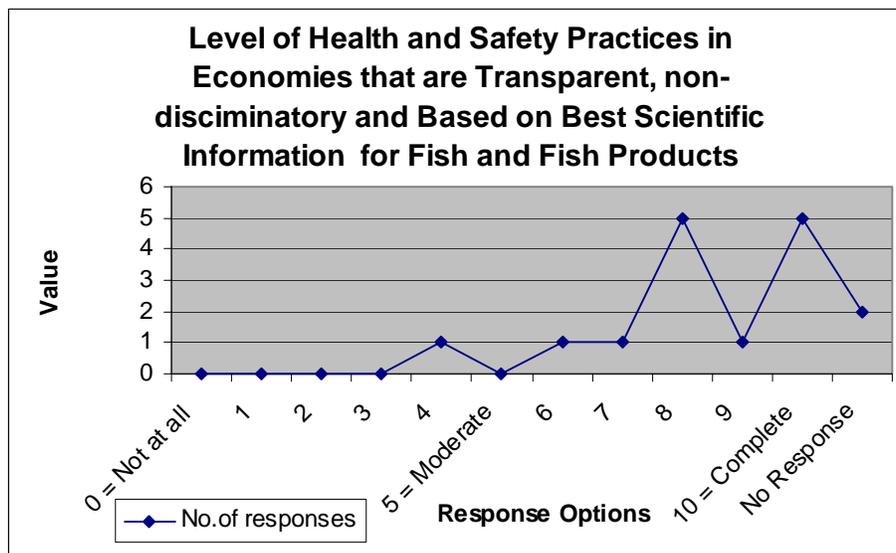
None reported.

Section Summary

<p>Almost three quarters of participating Economies reported that they have either taken moderate steps or fully complied with international law by removing discriminating practices that obstruct the trade of fish and fish products. However, quite a number of these Economies did not elaborate on the measures that have been taken. In each case where Economies did elaborate on their response, the focus was on the regulatory framework. No Economy reported that it has conducted a study to examine the nature and extent of discriminatory practice in fish trade. Such an approach fails to recognise the discriminating impact that informal structures and practices can have in a market place. There can be significant departure in market behaviour from the theoretical model suggested by a regulatory framework. Such behaviour can be influenced by factors such as; racism, cultural predispositions and beliefs, nationalism, entrenched practices and interests, monopolies, and other factors. To meet international obligation fully, there may be a need for intervention beyond the simple absence of regulatory control. Such interventions might include education and awareness building, promotion of market diversity, provision of alternative infrastructure or dismantling of monopolies etc. The absence of any indication by Economies of such effort suggests that there may be a need for further discussion and measures to promote genuine market access in the trade of fish and fish products.</p>



Question 45	Relates to BPA Action: II.xiv
To what extent does your Economy ensure that health and safety standards and practices for fish and fish products are transparent, non-discriminatory and based upon best scientific information?	Ensure that health and safety standards and practices for fish and fish products are transparent, non-discriminatory and based on best scientific information.



Interpretation of Quantitative Data

Almost all of respondent Economies rated high levels in ensuring that health and safety standards and practices for fish and fish products are transparent, non-discriminatory and based upon best scientific information.

Domestic Initiatives

Two Economies reported that they have a transparent and non-discriminatory health and food safety system for all imported products, and that these support science-based decision-making. One of these Economies stated that this policy is reflected in its Risk Analysis Framework and Import Risk Analysis Process. Another Economy said that it sets standards for fish and seafood exports based on science through its relevant ministry, and that it has an agency to ensure that standards are met based on a Quality Management Program. It stated that imported fish products are inspected to prevent the marketing of unsafe, unwholesome or mislabelled products. The Economy claims also to have published a guide on its regulatory requirements, which is available online. This Economy also declared that it plays active roles in all relevant international standard setting bodies, e.g. the Codex Alimentarius and the World Animal Health Organization. Another Economy stated that its sanitary measures affecting the import of fish and fish products are consistent with the WTO, General Agreement on Tariffs and Trades (GATT), SPS and TBT Agreements.

An Economy responded that it manages the quality and hygiene control of fish and fishery products through its National Inspection Service. Only fisheries products or companies that are approved by this institute can display certifications such as HACCP. This institute was said also to be in the process of implementing the management of 'country-of-origin' labelling, and genetically modified fish and other fishery products. Similarly, another Economy reported that its processing factories are required to obtain hygiene certification from a special bureau prior to exporting fish and fisheries products to the EU.

One Economy stated its compliance with international food safety standards and provided a source that lists its requirements.



Three Economies reported that rules on the implementation of HACCP have been promulgated. The fisheries sector of one of these Economies was also reported to have met the criteria of GMP, ISO 9000 and other international standards. One Economy claimed to have established a traceability system for monitoring sanitation of fishery products similar to the EU system. A new act was said to have been adopted to regulate relevant procedures for certification and labelling, aiming to upgrade the quality and safety of fisheries products. Another Economy also noted that it is in the process of drafting new food safety legislation to enhance safe food consumption and improve the traceability of fish and fish products.

An Economy stated that getting sufficient good scientific data to make best judgments/policies is the greatest challenge and that the implementation of continuous HACCP across the board would be the greatest success. Another Economy reported efforts such as: farm monitoring; inspection; and certification to ensure food safety of aquaculture products; implementation of Code of Conduct (CoC) and Good Aquaculture Practices (GAP); farm registration; and issuance of movement document.

One Economy stated that it has inadequate expertise and noted the need for capacity training.

Four Economies did not elaborate on successes or challenges.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

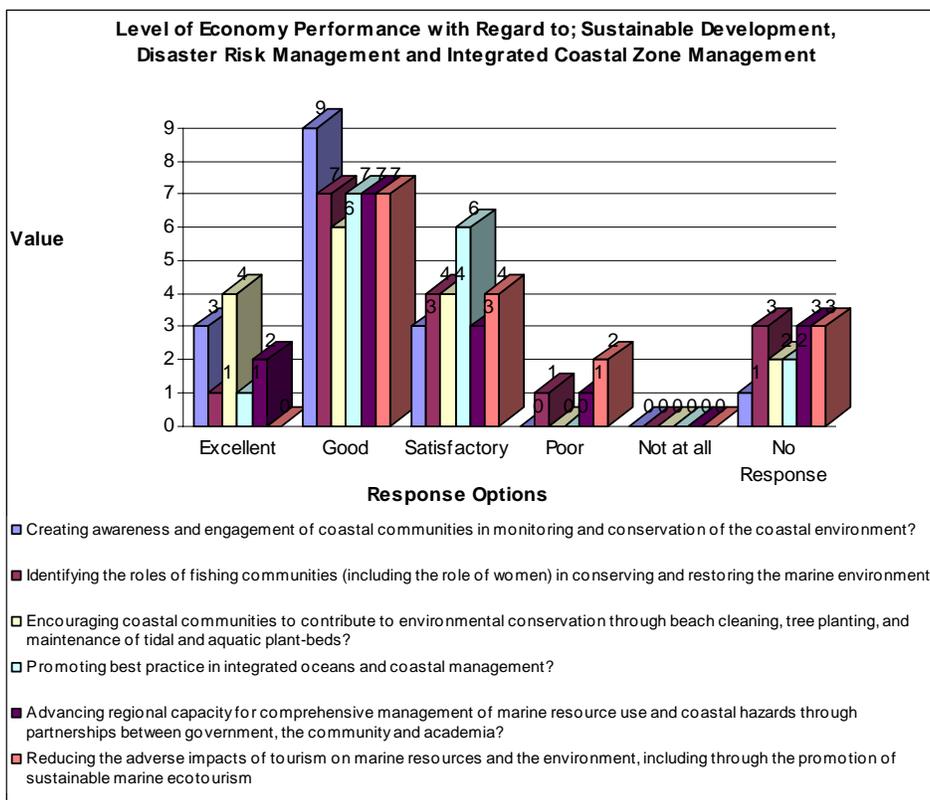
None reported.

Section Summary

With very few exceptions, APEC Economies reported that their health and safety standards and practices for fish and fish products are transparent, non-discriminatory and based on best available scientific information. Most of the Economies that elaborated on their response cited international standards and processes, e.g. HACCP, to support their conclusion that domestic processes are indeed fair and transparent. Although one Economy noted the challenge of producing good scientific data to support decision-making in this regard. No Economy described its arrangements for fisheries food safety scientific research.



Question 46	Relates to BPA Action: III.i, III.ii, III.iii, III.iv, III.v, III.vi.
<p>Consistent with the principles of sustainable development, disaster risk management and integrated coastal zone management, please rate how well your Economy has performed since September 2005 with regard to the following activities:</p> <p>a) Creating awareness and engagement of coastal communities in monitoring and conservation of the coastal environment?</p> <p>b) Identifying the roles of fishing communities (including the role of women) in conserving and restoring the marine environment?</p> <p>c) Encouraging coastal communities to contribute to environmental conservation through beach cleaning, tree planting, and maintenance of tidal and aquatic plant-beds?</p> <p>d) Promoting best practice in integrated oceans and coastal management?</p> <p>e) Advancing regional capacity for comprehensive management of marine resource use and coastal hazards through partnerships between government, the community and academia?</p> <p>f) Reducing the adverse impacts of tourism on marine resources and the environment, including through the promotion of sustainable marine ecotourism?</p>	<p>i: Develop outreach tools that would increase the awareness and engagement of coastal communities in various functions such as monitoring and conservation of the coastal environment.</p> <p>ii: Identify the various roles and functions of fishing communities, including the role of women, in conserving and restoring the marine environment.</p> <p>iii: Encourage coastal communities to contribute to environmental conservation through beach-cleaning, tree-planting and maintenance of tidal and aquatic plant-beds.</p> <p>iv: Promote best practices in integrated ocean and coastal management approaches.</p> <p>v: Advance regional capacity to address pressing marine resource use and coastal hazards issues by promoting a domestic and regional comprehensive approach that includes research, outreach and education through government, community and academic partnerships.</p> <p>vi: Reduce the adverse impacts of tourism on marine resources and the environment, including by promoting sustainable marine ecotourism.</p>





Interpretation of Quantitative Data

This six part question seeks to rate performance of APEC Economies since September 2005 with regard to sustainable development, disaster risk management and integrated coastal zone management:

a) All but one of the respondent Economies rated that they had a satisfactory to higher rating in creating awareness and engagement of coastal communities in monitoring and conservation of the coastal environment.

b) Half the participating Economies rated themselves above satisfactory in identifying the roles of fishing communities (including the role of women) in conserving and restoring the marine environment.

c) Twenty-five percent of participating Economies rated their performance as 'excellent' in encouraging coastal communities to contribute to environmental conservation through beach cleaning, tree planting, and maintenance of tidal and aquatic plant-beds. A further half of the Economies described their performance in this regard as 'good'.

d) Most Economies rated their performance in actively promoting best practice in integrated oceans and coastal management as satisfactory to good.

e) Three quarters of Economies reported that their efforts in advancing regional capacity for comprehensive management of marine resource use and coastal hazards through partnerships between government, the community and academia were satisfactory or better.

f) The quantitative assessment for efforts to reduce the adverse impacts of tourism on marine resources and the environment, including through the promotion of sustainable marine ecotourism, reflect a slightly weaker trend than for the other parts to this question. Indeed, two Economies rated their performance in this regard as poor and a further three declined to answer the question. However, overall, the majority of Economies rated their performance as satisfactory to good.

Domestic Initiatives

One developed Economy reported that it has created awareness and engagement in coastal communities through several outreach programmes e.g. National Marine Sanctuaries, National Estuarine Research Reserves, Sea Grants network and programs, coastal zone management plans and other coastal community resilience programmes. By effectively using appropriate fishery management planning, fishery management councils, and through other networks and programs, it claims to have assisted in identifying the roles of fishing communities. According to this Economy, promoting best practice in integrated oceans and coastal management has been done through the funding of conferences and/or workshops, and university/academic institutions. In a different approach, another developed Economy maintains that the degree of engagement with coastal communities varies depending on the priorities of the community, and the commitment of local and central government. Its fisheries management tools were said to provide for involvement by customary fishers in the management of traditional customary fishing areas.

A developed Economy reported that it has initiated a community driven initiative in one month of each year called 'Clean Up Day' with a strong emphasis on beach cleaning. It also claims to implement integrated oceans and coastal management through a range of initiatives, including regular meetings of senior officials from all jurisdictions, and a range of government agencies to discuss and agree on common approaches to coastal and oceans management. This group reports to a council of relevant ministers from all jurisdictions. Moreover, this Economy stated that it has world leading whale watching regulations that mitigate the potential adverse impacts on migrating whales from whale watching tourism operators. These include specifying the minimum distance that must be kept between boats and whales. The Economy also reported that within certain jurisdictions, it has put in place



guidelines for managing whale shark tourism, which like the regulation for whales, also includes distances between divers and the shark.

Two developed Economies maintain a public website on programs for the protection, monitoring, and conserving of the marine environment, and use this tool to disseminate information to coastal communities on various conservation efforts, including the designation of Marine Protected Areas. One website in particular features a section on what ordinary citizens can do to help.

Another developed Economy stated that it has strengthened a surveillance system of participating fishers, raising awareness of the need to ensure environmental conservation of the fishery, and has encouraged coastal communities to engage in activities to clean the beach. It further reported that its laws promote the conservation of identified forests that play an important role in maintaining living environments for aquatic animals.

One emerging Economy reported that only its water pollution control program protects and maintains the quality of its coastal waters. Another emerging Economy maintained that it has implemented an adaptive learning program for coastal community awareness and resilience in disaster management, and that it has conducted relevant projects in areas affected by natural disasters. The projects were said to include the training of a volunteer civil defence service to promote risk awareness and to establish a culture of safety.

Another emerging Economy reported that it has helped communities located in the coastal area by allowing NGOs to encourage coastal communities to contribute to environmental conservation. It further claimed to have commissioned related experts to conduct research and set up a limit on the total number of tourists allowed, so as to mitigate the impacts of marine tourism on the marine environment. In a similar manner, one emerging Economy stated that it has encouraged NGOs and community associations to organise regular tree planting and beach cleaning activities. It further observed that it maintains a web-page on a biological indicators monitoring program, and to disseminate information on the biological effects of pollution in local coastal waters. According to this emerging Economy, this program has recently celebrated its 20th anniversary by publishing three reports on the overview of water quality trends for the past two decades of beaches, rivers and marine water.

A developing Economy noted that it has established a multi-institutional commission for the protection of its marine environment and coastal zones. This commission reportedly includes all related Ministries, regional and local Districts. Best practice was said to be maintained for this initiative with the formation of seven specialised Technical Work Groups within the commission to promote integrated oceans and coastal management. The Economy claims that through these Work Groups, practical standards have been established to encourage indigenous communities, as well as a fisherman and farmers, to contribute to environmental conservation.

Another developing Economy reported that an event named the Beach Clean Up Movement has been held each year since 2003. Furthermore, it claims to have enacted several National Laws on The Management of Coastal Zones and Small Islands, and also conducted greenbelt planting activities at several sites.

Regional Initiatives

A developed Economy stated that it has large funding programs that are accessed by regional groups and communities for practical ground conservation measures, such as beach dune restoration and vegetation management to prevent dune erosion. Another developed Economy reported that it has made advances in regional capacity outreach by sharing its many home-grown programs with neighbouring countries. Only one developing Economy reported the implementation of workshop/training and cooperation initiatives with other institutions throughout the Region.



Relevant International Initiatives

A developed Economy reported that it is encouraging coastal communities and the international coastal community to have a national beach clean-up day. It also reported that NGOs and business based within the Economy have taken actions internationally to reduce the adverse impacts of tourism on the marine environment.

According to an emerging Economy, it has pledged in 2007 to promote international exchanges and the sharing of experience on environmental protection policies and technological research through an 'Environment and Conservation Fund' that involves community and academia.

Discussion of Organisational Perspective (from the Survey of Organisations)

Organisation responses show a moderate level of relevant activity at a domestic and regional dimension.

a) A number of initiatives and programs were cited to create awareness and engagement of coastal communities in monitoring and conservation of coastal environments. In some instances, initiatives such as a Seagrass Watch project and participation in the XXXII *Pacem in Maribus Conference* in 2007 were reported. At the regional level, two IGOs observed that there are a number of ICM initiatives in many Economies, and that there is an active program of learning and sharing occurring both within, and from outside of the APEC framework.

b) Specific examples and generic reference to programs were made by respondent organisations on the level and types of initiatives occurring to identify the role of fishing communities in conservation and restoration of the marine environment. Amongst the cited activities was a turtle conservation program. No specific mention of gender based initiatives was noted.

c) ICM was promoted in the qualitative comments as a means to encourage community involvement in environmental conservation. Respondents reported generic actions including the delivery of publications aimed at encouraging community involvement.

d) Respondent organisations cited a moderate level of activity specifically focused on the promotion of best practice in integrated ocean and coastal management. Interestingly, one IGO stated that the task of defining best practice is problematic. Positive Economy outcomes were said to include adoption by an Economy of ICM policy as a national strategy, delivery of training courses on MPA development and management, coral reef initiatives, promotion of best practice through fisheries certification, and participation and sharing of best practice through a conference.

e) Respondent organisations reported various initiatives that contribute to advancing regional capacity for managing marine resources and hazards, where partnerships between government, academia and other institutions were noted. Two examples in particular are likely to have produced positive outcomes, i.e. the development of a National Disaster Warning Centre, and an Inter-Economy Cooperative Project specific to post-tsunami matters.

f) The level of organisation involvement in activities aimed at reducing the adverse effect of marine tourism was moderate. The elaboration provided also offers limited scope to understand the nature of these activities or initiatives.

Section Summary

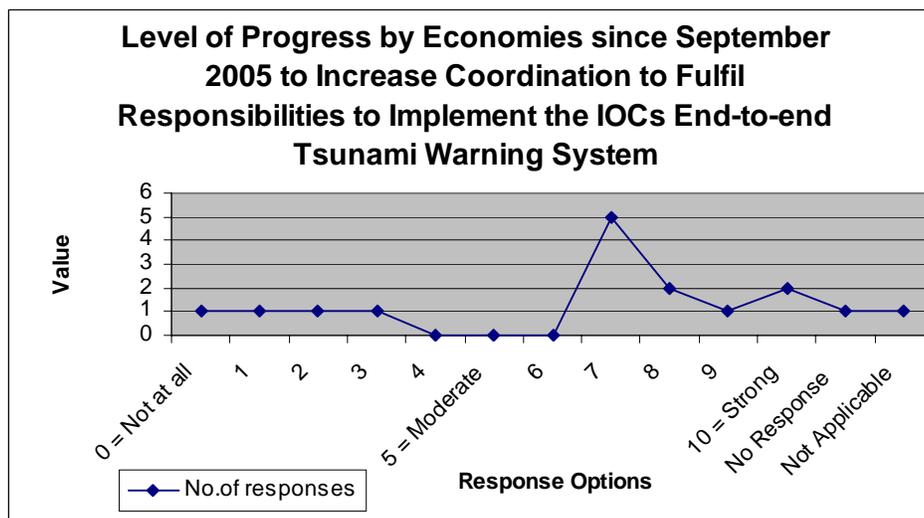
This question investigates Economy activities relating to the engagement of coastal communities and fishing communities, particularly women, for the conservation and management of the marine environment. It also seeks to assess the extent to which ICZM has been promoted, and partnerships established to meet the challenges of marine resource use and coastal hazards. Lastly, the extent to which impacts of marine tourism have been addressed is also explored.



The quantitative results report strong performance by almost all participating Economies in each part of the question. However, most qualitative elaboration was provided by developed Economies. Two emerging Economies cited initiatives mostly related to water quality management, and most developing Economies declined to comment. Such an outcome could reflect the 'soft' nature of initiatives that defy simple measurement and are less tangible than infrastructure development or new legislation etc. The absence of specific details by lesser developed Economies could suggest that the quantitative results are more a reflection of commitment than achievement, and that there may be scope for greater awareness building, education and expertise transfer to assist developing Economies with these challenges.



Question 47	Relates to BPA Action: III.vii
Please indicate the level of progress that your Economy has made since September 2005 in increasing coordination to fulfil responsibilities to implement the IOC's end-to-end tsunami warning system.	Increase coordination to fulfil responsibilities to implement the IOC's end-to-end tsunami warning system, including contingency planning.



Interpretation of Quantitative Data

Over 60% of participating Economies rated moderate to high levels in increasing coordination to fulfil responsibilities to implement the IOC's end-to-end tsunami warning system. A quarter of the respondent Economies rated less than moderate levels. One Economy did not respond to this question, and another declared that it is 'not applicable'.

Domestic Initiatives

A developed Economy reported that it has facilities that are responsible for issuing tsunami warnings. Moreover, it also stated that it has provided a tsunami preparedness fund to coastal communities. This fund was said to have been used to identify risks, develop enhanced response plans, upgrade communication and warning systems, and support public education programs. To assist these coastal communities, this developed Economy recommended that tsunami planning provide guidance to emergency managers in: determining their evacuation areas, evacuation routes and safe areas; preparing emergency response plans; and providing public education.

This developed Economy further reported that it has initiated a project to coordinate the efforts of all stakeholders (the authorities, communities, private industry, humanitarian organisations and the media) to ensure the enhancement of its tsunami preparedness. As part of this project, a thorough review of all available tsunami warning methods was said to have been carried out to develop "a toolkit for community planning". The toolkit was reportedly made available to community emergency personnel. Based on this toolkit, the authorities were said to be currently collaborating to implement Weather Radio as a key communication tool for tsunami warnings in the coastal area.

Furthermore, this developed Economy indicated that it is setting up a seven-station GPS network prototype to facilitate real-time positioning along the coast of its subduction zone. The aim is to evaluate the feasibility of automatically determining, within minutes, major vertical and horizontal motion at coastal areas, versus inland GPS stations, that would unambiguously indicate tsunami generation. The Economy declared that it hopes that this



relatively low cost technique can become a mainstream tool of tsunami warning systems worldwide.

Another developed Economy reported that it has had success by forming a tsunami working group, and through this working group, has made progress in setting up tsunami signage national standards, and the formation of a local level planning guideline. According to this developed Economy, it is still working on a national tsunami contingency plan, and is in initial discussions with its scientific community on evacuation plan guidelines. Yet another developed Economy observed that it has installed a Deep Ocean Tsunami Monitoring Buoy in the seas around one of its main islands. Only one developed Economy reported that it has already established its end-to-end tsunami warning system and noted that it has been in place the last ten years. This Economy expressed the opinion that its system is considered the best in the region.

One emerging Economy stated that it has included tsunami risk as an explicit item in its Contingency Plan for Natural Disasters, and has published educational materials on tsunami to educate members of the public. Similarly, another emerging Economy noted that it has formulated a contingency manual for earthquake and tsunami disasters, which includes necessary measures and the roles of authorities and relevant organisations. Another emerging Economy reported that it has successfully deployed 2 tsunami-meters and is planning to deploy another one before the end of 2007.

A developing Economy reported that it has responded to the threat of tsunami disasters by providing multi – hazard mitigation instead of just a tsunami warning system. According to this Economy, it has also implemented the IOC's end-to-end tsunami warning system as follows:

1. Establishment of National Disaster Warning Centre (NDWC)
2. Technical cooperation between NDWC and a developed Economy through the Pacific Disaster Centre.
3. Technical cooperation between NDWC and a developed Economy under the Indian Ocean Tsunami Warning System to implement Tsunami Alert Rapid Notification System (TARNS)
4. Technical cooperation between NDWC and the Asian Disaster Preparedness Centre (ADPC) under financial support from the United Nations International Strategy for Disaster Reduction (UN/ISDR) to implement knowledge-based capacity building.
5. Technical cooperation between NDWC and United Nations Development Programme (UNDP) to implement training on Disaster Early Warning System for government function levels in tsunami prone provinces.
6. Technical cooperation between NDWC and UNESCO/IOC to implement Adaptive Learning in Disaster Management for Community Awareness and Resilience.
7. Technical cooperation between NDWC and United Nations Office of Coordination for Humanities affairs (UN/OCHA)/UNDP under United Nations Special Envoy Program to implement competition on the best community work plan on disaster preparedness and response (CBCWP)
8. NDWC deployed a Deep Ocean Assessment and Reporting of Tsunami (DART) in the high seas.
9. NDWC installed 79 warning towers in strategic locations along the sea's coastal areas.
10. NDWC developed and improved Standard Operating Procedures (SOP) for tsunami response.
11. NDWC carried out full-scale early warning system drill.

A developing Economy also reported that it has conducted training for citizens living in a tsunami prone area.

Regional Initiatives

A developed Economy mentioned that it has stationed Deep Ocean Tsunami Monitoring Buoys near its coast and additional seismic stations in its region.



A developing Economy reported that it is in discussion with a developed Economy to acquire technical assistance on earthquake seismic wave observation technology.

Relevant International Initiatives

A developed Economy reported that its seismic stations assist the Pacific Tsunami Warning Centre in detecting and pinpointing the location and strength of earthquakes and tsunamis. It also stated that it has played a key role in IOC meetings on end-to-end warning systems in the Indian and the Pacific Oceans. This developed Economy also reported that it has deployed 100 newly developed low-cost Internet communicating strong motion accelerographs in the subduction region of its coast. The instrument network was said to extend from the outer coast to 150km inland. Currently, automated algorithms are being explored to make this an effective part of a tsunami alerting system. This system reportedly comprises a network of tsunami-metered instruments that continuously operates ocean bottom seismographs that scan the region.

Another developed Economy reported that its successes in implementing the IOC's end-to-end tsunami warning system includes coordinating and providing technical expertise globally on all aspects of tsunami early warning from detection to public readiness (including technology transfer of DART buoys, tide gauges, RANet, and conducting capacity building on warning centre operations, communications, coastal community resilience, etc.). Special emphasis was said to be placed on the Southern ocean. The Economy noted that the main challenge was to set up mechanisms so that tsunami early warning systems can be sustained by partners.

Discussion of Organisational Perspective (from the Survey of Organisations)

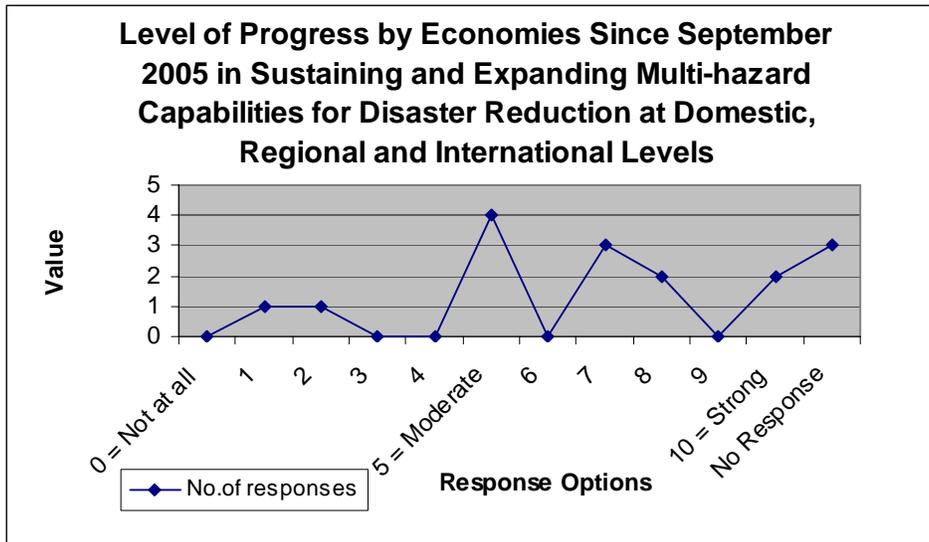
In general, respondent elaboration cited a number of associated initiatives and projects, which in essence support the broader end-to-end IOC tsunami warning system. However, the reported actions were limited and therefore are not likely to provide many options at present to explore collaborative opportunities. One exception to this conclusion might be development of the National Disaster Warning Centre.

Section Summary

Several Economies cited their development of physical tsunami warning facilities rather than focus discussion on coordination initiatives as explored by the question. Nevertheless, developed Economies tended to report favourably in qualitative elaboration to help corroborate the generally positive quantitative results. Two developing / emerging Economies outlined impressive efforts to coordinate tsunami warning responsibilities; however, ten Economies indicated their efforts in this area as moderate to strong, which suggests that there could have been scope for more qualitative elaboration.



Question 48	Relates to BPA Action: III.viii (Part thereof)
Please rate the level of progress which your Economy has made since September 2005 in sustaining and expanding the multi-hazard capabilities for disaster reduction at domestic, regional and international levels.	Sustain and expand as required multi-hazard capabilities for disaster reduction at domestic, regional and international levels, including the use by APEC Economies of the forthcoming All-Hazards Forecast and Warning Compendium that is a product of the June 2005 APEC/US Workshop in Hawaii.



Interpretation of Quantitative Data

A majority of Economies rated moderate to high levels of progress in sustaining and expanding the multi-hazard capabilities for disaster reduction at domestic, regional and international levels since September 2005. Two Economies were rated below moderate, and a further three did not respond.

Domestic Initiatives

An Economy reported that it has prepared for management of marine hazards to the coastal environment through its integrated coastal zone management policy. Another Economy cited progress made after the 2004 Tsunami with the set up of 19 seismic stations linked by VSAT (very small aperture terminal). A developed Economy stated that it has enhanced its tsunami warning system by the placement of DART buoys, expansions of a sea level monitoring network, improvement to a seismic network and the creation of a national tsunami warning centre. Additionally, this Economy noted that a national forum to examine the challenge of emergency warnings delivery network has been convened. Moreover, the capability of Urban Search and Rescue for that Economy was said to have been enhanced through the provision of a grant to purchase state-of-the-art equipment, as well as training for personnel.

The outbreak of Severe Acute Respiratory Syndrome (SARS) was cited by an Economy as the trigger to make efforts to prepare for similar incidences like Flu Pandemic and Avian Influenza.

A developed Economy observed that it has published a National CDEM Plan, a National Hazardscape Report, and a Pandemic Plan. This Economy also claimed to have conducted an exercise program at a national scale (e.g. Capital Quake, Ruaumoko and Cruickshank). A developing Economy said that it has passed a National Law on Disaster Management, and another on Coastal Zone and Small Islands Management. That Economy also cited a national level training program (Training the Trainers) along with four training courses available at the



local level.

A one-year long Safer-living Program was said to have been successfully launched in one Economy. However, another Economy reported a lack of funding and expertise as impediments to making progress on this matter. In addition, another Economy noted a need to restructure its National Disaster Warning Centre (NDWC).

Regional Initiatives

A developed Economy reported that it held a meeting with ASEAN in 2007, which resulted in cooperation in the area of Disaster Risk Reduction. A joint work plan was adopted, and the Economy said that it committed itself to promote disaster risk reduction as a priority in development programming and institutional capacity building. The same Economy also noted a Bilateral Caribbean Program through which it has reportedly undertaken initiatives to improve the capacity of disaster management bodies. Under the Program, a Disaster Preparedness Project was said to have been implemented jointly between the Economy and the Caribbean in 2005. In addition, this Economy claimed to have helped the Caribbean in developing a new harmonised Caribbean regional enhanced disaster risk management framework. However, several challenges were said to have been identified along the way. Institutional weaknesses were observed to hamper the building of decentralised national entities. Disaster management was also not seen to have been elevated on national agendas. Therefore, that Economy concluded that institutional capacity building is a major need. At the same time, the financial and technical resources to expand capacity at the local/national levels was also felt not to have been sufficient. There was limited progress in integrating disaster management into planning/policies due to poor political will.

Haze is a common environmental issue in the Southeast Asia. An Economy reported participation in regional initiatives on measures to mitigate the impact of haze.

Relevant International Initiatives

An Economy reported that it helped formulate the third comprehensive measures for the United Nations Framework Convention on Climate Change (UNFCCC), and that it is currently establishing the fourth comprehensive measures based on the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report. The measures were said to include impact of climate change on the oceans and fisheries sector and responses to climate change.

Discussion of Organisational Perspective (from the Survey of Organisations)

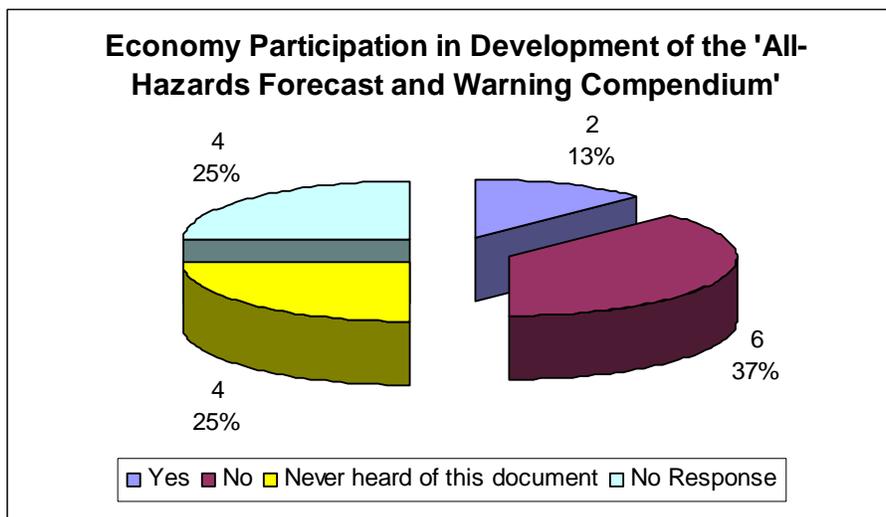
None reported.

Section Summary

Although 11 Economies rated their level of progress in sustaining and expanding multi-hazard capabilities for disaster reduction as moderate or better, four of these did indicate only moderate progress (i.e. a score of 5). Five Economies indicated either poor progress or did not respond to the question. The qualitative elaboration reflected initiatives taken mostly by developed Economies, which suggests that there is probably scope for further education and effort in this area.



Question 49	Relates to BPA Action: III.viii (Part thereof)
Has your Economy participated in the 'All-Hazards Forecast and Warning Compendium' initiated by the June 2005 APEC/US workshop in Hawaii?	Sustain and expand as required multi-hazard capabilities for disaster reduction at domestic, regional and international levels, including the use by APEC Economies of the forthcoming All-Hazards Forecast and Warning Compendium that is a product of the June 2005 APEC/US Workshop in Hawaii.



Interpretation of Quantitative Data

The quantitative interpretation demonstrates that a large majority of respondent Economies have not participated in the 'All-Hazards Forecast and Warning Compendium' initiated by the June 2005 APEC/US workshop in Hawaii. Indeed, 50% of the Member Economies either reported that they have never heard of this document or did not respond.

Domestic Initiatives

None reported.

Regional Initiatives

None reported.

Relevant International Initiatives

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

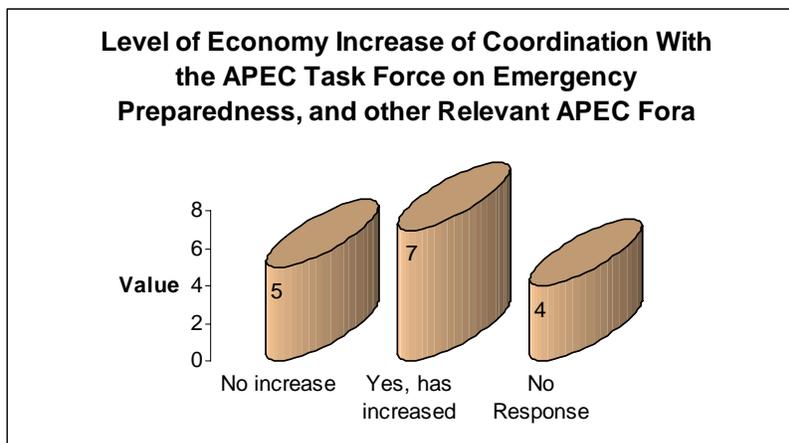
None reported.

Section Summary

The absence of any qualitative elaboration for this question, combined with a high number of Economies that indicated that they have neither participated in, nor heard of the 'All-Hazards Forecast and Warning Compendium' suggests that this particular tool is yet to enjoy wide acceptance.



Question 50	Relates to BPA Action: III.ix (Part thereof)
<p>Since September 2005, has your Economy increased its level of coordination with the APEC Task Force on Emergency Preparedness, and other relevant APEC fora?</p>	<p>Enhance the readiness of coastal communities for possible future tsunamis by increasing coordination with the APEC Task Force on Emergency Preparedness and other relevant APEC fora, and increasing the use of expertise of the International Tsunami Information Centre through the International Coordination Group for the Tsunami Warning System in the Pacific; and the Indian Ocean Tsunami Warning System.</p>



Interpretation of Quantitative Data
 A small majority of respondent Economies rated increased levels of coordination with the APEC Task Force on Emergency Preparedness, and other relevant APEC fora. Other Economies rated no increase, with four Economies that did not respond.

Domestic Initiatives
 None reported.

Regional Initiatives
 None reported.

Relevant International Initiatives
 One developed Economy hosted the APEC Task Force on Emergency Preparedness CEO's Forum in Cairns in September 2007 as part of the 2007 APEC series of meetings. Another developed Economy also cited their participation in the Forum. A complementary seminar was held by a developed Economy on the Improvement of Coastal Disaster Prevention Technology in Colombo, February 2007. Furthermore, a developed Economy claimed to have actively participated in the APEC Health Task Force, which aims to address health-related threats to trade and security, focusing on emerging infectious disease. A developed Economy reported that it co-sponsored a Tsunami Coastal Resilience Project, which was said to be of interest to the TFEP (Task Force on Emergency Preparedness). On the other hand, a developing Economy cited its efforts at coordination with APEC, "...especially for the Activities Proposal 2007, and Tsunami Preparedness through education, training and outreach."

**Discussion of Organisational Perspective (from the Survey of Organisations)**

Responses indicate a low level of confidence that improved coordination will lead to improved ability for coastal communities to act decisively in the face of a tsunami threat. Only one organisation reported significant improvements for one Economy in which it claimed that many measures had been applied after a recent significant tsunami event. An IGO concluded that Asian coastlines are still largely unprepared, although it noted some awareness of the need for buffer zones in coastal development planning. Nevertheless, this organisation claimed that the reality is that often, in the context of marine tourism, these buffers are disregarded. This IGO also noted that coastal tourism is possibly an impediment to adequate hazard planning, and that in some countries residents sometimes do not have the luxury to choose to live elsewhere. Additionally, this IGO claimed that an over-emphasis on tsunami now over-shadows the need for other disaster preparedness for threats that are likely to occur more frequently, as evidenced by cyclone Nargis (i.e. cyclones and tropical storms).

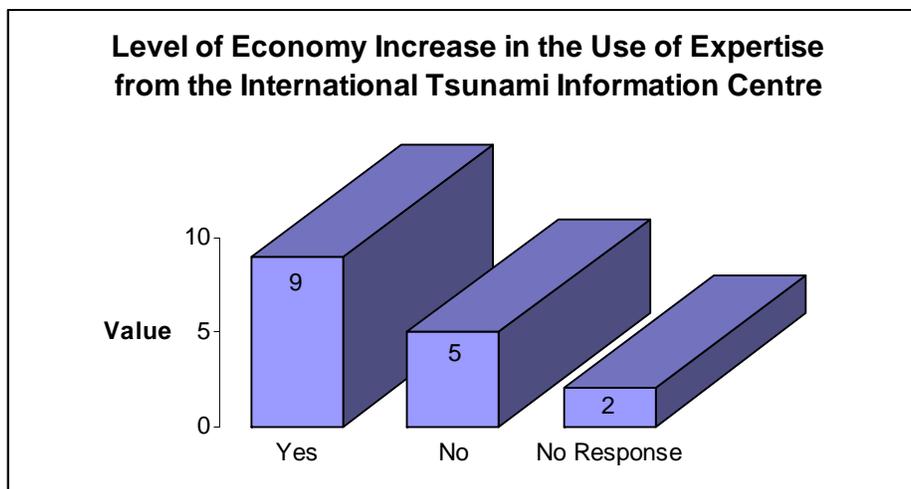
The low level of respondent organisation involvement in collaboration for the Tsunami Warning System in the Pacific or the Indian Ocean Tsunami Warning System reinforces the conclusion made by several organisations that such action is outside the scope of their operational mandate.

Section Summary

Almost half of the participating Economies claim that the level of their coordination with the APEC Task Force on Emergency Preparedness (ATFEP) has increased since September 2005. The comments offered in elaboration were nearly all by developed Economies and referred to workshops. One developing Economy noted that its tsunami preparedness was coordinated with the ATFEP through education, training and outreach. However, there were no examples cited to offer evidence that preparations for emergency response at the Economy level throughout APEC have been modified or developed in any way to bring them into line with ATFEP outcomes. Therefore, perhaps the ATFEP itself might consider a project to explore this question, the implications of which could suggest that extra effort at communication and engagement is needed.



Question 51	Relates to BPA Action: III.ix (Part thereof)
Since September 2005, has your Economy increased its use of expertise from the International Tsunami Information Centre through the International Coordination Group for the Tsunami Warning System in the Pacific, or the Indian Ocean Tsunami Warning System?	Enhance the readiness of coastal communities for possible future tsunamis by increasing coordination with the APEC Task Force on Emergency Preparedness and other relevant APEC fora, and increasing the use of expertise of the International Tsunami Information Centre through the International Coordination Group for the Tsunami Warning System in the Pacific; and the Indian Ocean Tsunami Warning System.



Interpretation of Quantitative Data

A majority of respondent Economies rated an increase in use of expertise from the International Tsunami Information Centre through the International Coordination Group for the Tsunami Warning System in the Pacific, or the Indian Ocean Tsunami Warning System. Whereas, slightly more than quarter of the Member Economies rated that they have not increased use of this expertise. Only two Economies did not respond.

Domestic Initiatives

Two developed Economies noted their support of the International Tsunami Information Center (ITIC) and the range of products and services offered. These Economies reported that they utilise the TsunamiTeacher in local management policy, along with the brochure "Tsunami-The Great Waves", the Tsunami Glossary, and the poster "Tsunami on the Move..". One developing Economy stated that they received Coastal Community Resilience Training from the ITIC.

Regional Initiatives

Six Economies noted their membership of the Pacific Tsunami Warning System (PTWS) while two other Economies said they have participated in the Indian Ocean Tsunami Warning System.

Relevant International Initiatives

Five Economies reported that they are a party to the ITIC. A developed Economy also declared that it is dedicated to promoting the sharing and utilization of related expertise through this platform by increase of staffing, hours of operation, funding, and activities including efforts on member points of contact and the Pacific-wide drill. Another Economy reported that it conducted a review on TsunamiTeacher when it was released and provided



corrections/comments to the ITIC for the upcoming English version. This Economy also said that it assists the ITIC effort to make reference material more readily available to the tsunami community by developing virtual libraries of tsunami publications. Thus, a pdf version of the publication "Seismic Sea Waves-Tsunamis" was said to have been made available. Similarly, a developed Economy claimed to have cooperated with ITIC in the training of international tsunami warning procedures and preparedness, as well as in the assessment of developing countries through ICG/IOTWS and the ICG/PWTS.

Discussion of Organisational Perspective (from the Survey of Organisations)

Responses indicate a low level of confidence that improved coordination will lead to improved ability for coastal communities to act decisively in the face of a tsunami threat. Only one organisation reported significant improvements for one Economy in which it claimed that many measures had been applied after a recent significant tsunami event. An IGO concluded that Asian coastlines are still largely unprepared, although it noted some awareness of the need for buffer zones in coastal development planning. Nevertheless, this organisation claimed that the reality is that often, in the context of marine tourism, these buffers are disregarded. This IGO also noted that coastal tourism is possibly an impediment to adequate hazard planning, and that in some countries residents sometimes do not have the luxury to choose to live elsewhere. Additionally, this IGO claimed that an over-emphasis on tsunami now over-shadows the need for other disaster preparedness for threats that are likely to occur more frequently, as evidenced by cyclone Nargis (i.e. cyclones and tropical storms).

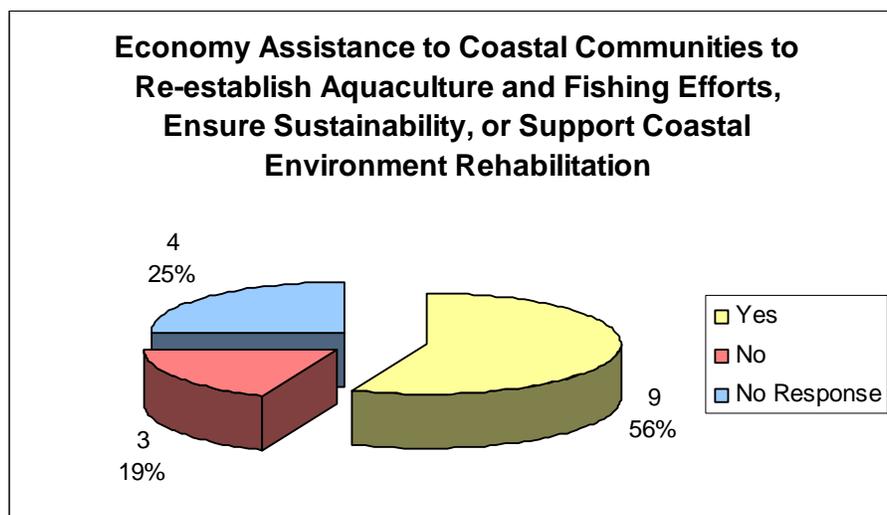
The low level of respondent organisation involvement in collaboration for the Tsunami Warning System in the Pacific or the Indian Ocean Tsunami Warning System reinforces the conclusion made by several organisations that such action is outside the scope of their operational mandate.

Section Summary

More than half of the responding Economies indicated that they have increased its use of expertise from ITIC. The elaborative comments suggest the form of such use has been through application of ITIC tools, including TsunamiTeacher. However, a high number of these comments also suggest that many APEC Economies actually contribute expertise to ITIC rather than draw upon it.



Question 52	Relates to BPA Action: III. x
Since September 2005, has your Economy assisted any affected coastal community to; re-establish aquaculture and fishing effort, ensure sustainability, or rehabilitate the coastal environment?	Re-establish income-generating activities of affected coastal communities, including re-establishing aquaculture and fishing effort, ensuring sustainability, and support coastal zone environmental rehabilitation.



Interpretation of Quantitative Data

A majority of respondent Economies reported that they have assisted affected coastal communities to re-establish aquaculture and fishing effort, ensure sustainability, or rehabilitate the coastal environment. However, almost half of the participating Economies either replied negatively to this question or did not respond.

Domestic Initiatives

Two Economies noted that they were affected by the 2004 Tsunami. One of these Economies cited reconstruction under the Marine and Coastal Resources Management Project (MCRMP) and through Coral Reef Rehabilitation and Management Project (COREMAP) II. The other Economy said that it helped the fishing community by providing new boats and by rehabilitating the coastal environment by mangrove replanting. Also, aquaculture activities were said to have been re-established and research conducted on the impact of the tsunami on local fishery resources. Meanwhile, a developed Economy cited numerous coastal resource management programs related to the rehabilitation of the coastal environment in several jurisdictions.

An earthquake on the magnitude of 8 took place in one Economy in August 2007, killing 500 people and 1,500. That Economy noted that rescue efforts had been sent to Ica, the hardest-hit town.

Regional Initiatives

A developed Economy noted that, in 2005/2006, it supported 'World Vision' relief and rehabilitation work for the Manam Island volcanic eruption victims. This aid was said to include assistance with fishing equipment intended to restore livelihood. Additionally, two small grants (\$ 30,000) were cited as a contribution by this Economy in 2006/2007 for projects to help with reconstruction following the July 2006 tsunami/quake on the south Java coast (Pangandaran area). These funds were said to have provided assistance to fishermen and to have helped to restore the beach environment. Furthermore, the same Economy claimed that aid is given to the communities across Western and the Choiseul provinces of



Solomon Islands to rehabilitate their fisheries livelihood following an earthquake and subsequent tsunami on April 2007.

Aquaculture technology was said to have been transferred to Aceh post tsunami by an Economy which also claimed to have provided aid in home-building and cash contributions.

Relevant International Initiatives

Three respondent Economies noted aid to tsunami affected fishing communities in order to re-establish fishing effort (e.g. providing fishing boats). Moreover, a developed Economy, claimed to be currently funding six post-tsunami rehabilitation projects that include:

- **International Fund for Agricultural Development – Tsunami 2007-2009**
This \$1,200,000 project supports the Post-Tsunami Coastal Rehabilitation and Resource Management Programme. It focuses on the recovery and development of artisan fisheries and other economic activities in tsunami-affected areas.
- **Integrated Social and Economic Recovery– Tsunami 2006-2009**
The \$4,699,303 project assists coastal communities at the civil society level to rebuild their social and economic infrastructure through community-based enterprises. These enterprises not only assist in restoring livelihoods, but also engage the communities in a process of awareness building and positive community action on good governance, transparency, gender equality and peace-building.
- **OXFAM- Tsunami Project 2006-2008**
The \$1,331,168 project seeks to improve household livelihood security and encourage economic growth by increasing the asset base (including skills) of drought and tsunami affected rural organisations, businesses and producers. The project seeks to build the capacities of rural organisations to better manage communal resources and contribute to equitable allocation of land and water for pastoral and agricultural activities.
- **Rehabilitation and Development Program – Tsunami 2006-2009**
The \$4,590,000 project seeks to restore and enhance the livelihood of small-scale producers in the fisheries and agriculture sectors in tsunami-affected rural communities, with a focus on women. Oxfam also seeks to improve affected communities' access to quality water for drinking and domestic and agricultural purposes, and to strengthen the communities' ability to cope with future disasters.
- **District Master Plan - Tsunami 2006 - 2008**
This \$2,500,000 project aims to develop a comprehensive master plan to guide sustainable reconstruction over five to seven years, addressing the district's tsunami and conflict-related reconstruction needs.

Apart from the initiatives of the above-mentioned Economy, a developed Economy has provided bilateral grant aid in the fishery and coastal environment fields. However, this contribution is "...not included in the loan aid or the cooperation through international organisations."

Also, a project was reported by a developed Economy concerning coastal community resilience in two tsunami-hit Economies. This project "...involved capacity building workshops, development of a region-wide guide, and pilot cases." The same Economy went further to invest in a Sea Partnership Program, which was said to entail micro-credit and restoration projects.

Discussion of Organisational Perspective (from the Survey of Organisations)

Although the number of respondent organisations citing relevant activity was minimal, it is clear from the comments offered in elaboration that several activities are well supported by non-APEC organisations.

One NGO reported that in the aftermath of the 2004 tsunami it had conducted adaptive learning training in disaster management for community awareness and resilience purposes under the UNESCO/IOC program. This NGO further claimed to have provided technical



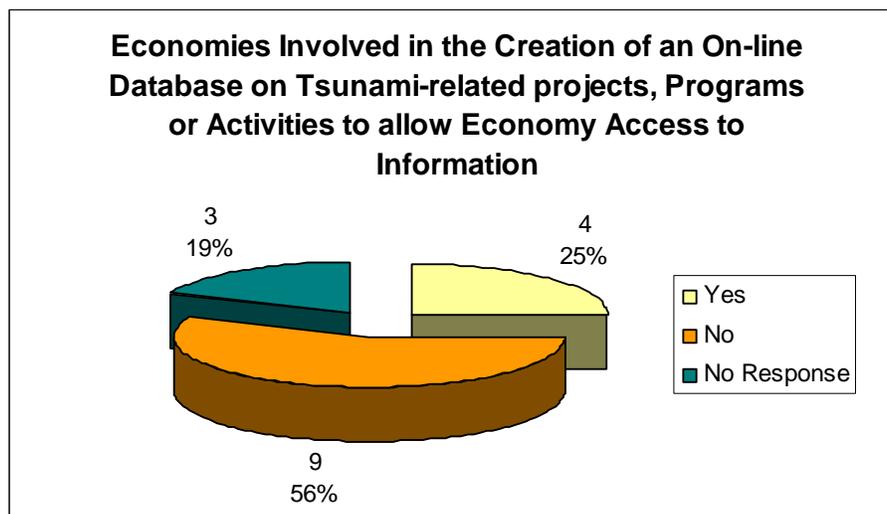
cooperation for UNOCHA and the Asian Disaster Preparedness Centre (ADPC) as well as through the United Nations International Strategy for Disaster Reduction. Another NGO stated that it was in the very early stages of providing assistance in fisheries rehabilitation. One IGO reported that, together with FAO, it has been involved extensively throughout the post-tsunami period on initiatives/programs ranging from assessments to the development of long-term rehabilitation. Also, as a key coordinating body of the CONSRN initiative, it claimed to have participated in an informal regional initiative headed by a number of fisheries related organisations to assist States affected by the recent Indian Ocean 2004 tsunami in fisheries and aquaculture rehabilitation.

Section Summary

The BPA commenced only nine months after the most catastrophic tsunami in recorded history hit certain NE Indian Ocean rim countries. Since then there have been other earthquakes and tsunamis. These events have given rise to many instances of international assistance, most, if not all, of which have involved APEC Economies. Such activity is reflected generally in the response to this question. The qualitative elaboration also indicates that such assistance extends to the rebuilding of communities and marine economic capacity in coastal regions that have been damaged by natural disasters.



Question 53	Relates to BPA Action: III. xi
Since September 2005, has your Economy been involved in the creation of an on-line database to allow APEC Economies to update and view details of all tsunami-related projects, programmes or activities?	Investigate the use of an on-line database to allow APEC Economies to update and view details of all tsunami-related projects, programs and activities.



Interpretation of Quantitative Data

A significant majority of the participating Economies indicated that they have not been involved in the creation of an on-line database to allow APEC Economies to update and view details of all tsunami-related projects, programmes or activities, or declined to answer the question. Nevertheless, 25% of the Economies stated that they have created an on-line database.

Domestic Initiatives

One developed Economy has developed 'RiskScape'. RiskScape is a multi-hazard tool that models potential losses and supports decision-making for the management of natural hazard events. The Economy reported that RiskScape would improve access to information and enable better management of post natural-hazard recovery for a range of end-users: including land-use planners, emergency managers, and the insurance industry.

Another Economy observed that it also has undertaken works to develop a tsunami online database.

Regional Initiatives

A developed Economy reported that it is involved in the Working Group on Tsunami Warning and Mitigation in the Southwest Pacific Ocean (PTWS), with an aim of enhancing tsunami warning and mitigation in the South-west Pacific Ocean.

Relevant International Initiatives

One developed Economy observed that it has an International Development Agency established in 1968 that is mandated to support sustainable development in developing countries in order to reduce poverty.

That same Economy reported that one agency within the Economy provides web-based



educational material on tsunamis. The Economy also stated that information on the water level for Pacific coast is also available on the website.

Discussion of Organisational Perspective (from the Survey of Organisations)

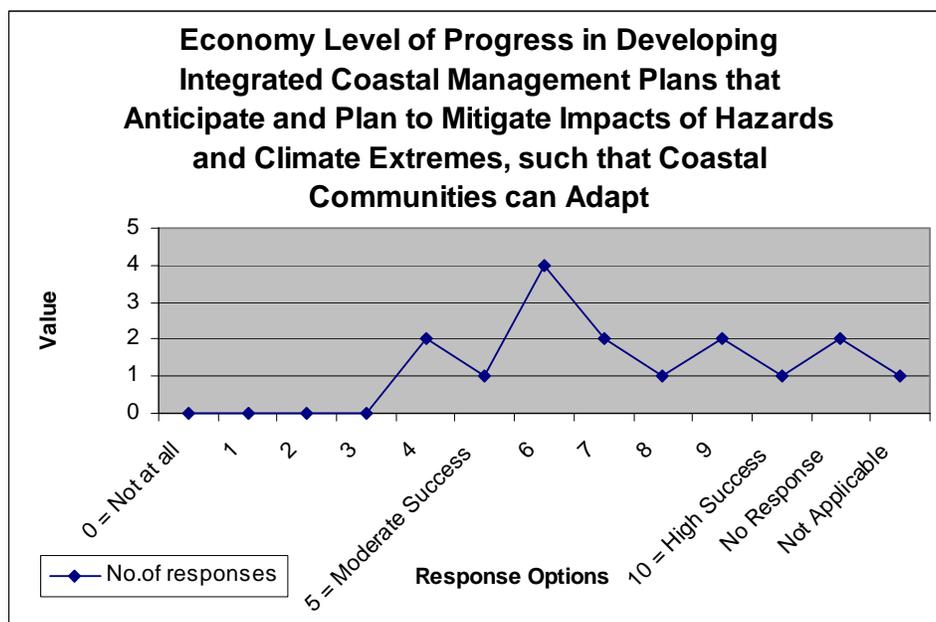
Several organisations claimed to be delivering tsunami information databases; however, no specific examples were cited.

Section Summary

Although four Economies reported that they have taken domestic initiatives to establish a tsunami-related on-line database, most indicated that they have not done so, or declined to respond to the question. Such an outcome suggests either that such a tool is not considered useful or that there remains a requirement for considerably more effort in this regard.



Question 54	Relates to BPA Action: III. xii
How successful has your Economy been in undertaking the development of integrated coastal zone management plans that anticipate and plan to mitigate the impacts of hazards and climate extremes, such that coastal communities can adapt and mitigate detrimental effects?	Develop integrated coastal zone management plans that anticipate and plan to mitigate the impact of hazards and climate change extremes, allowing coastal communities to adapt and mitigate the affects.



Interpretation of Quantitative Data

More than half of participating APEC Economies rated moderate success in undertaking the development of integrated coastal zone management plans that anticipate and plan to mitigate the impacts of hazards and climate extremes, such that coastal communities can adapt and mitigate detrimental effects. Four Economies reported high success in this regard, while three others either did not respond or indicated that the question was not applicable.

Domestic Initiatives

Two developed Economies and a developing Economy reported that they have implemented legislation that incorporates provisions relating to coastal hazards. One of these Economies developed a National Coastal Policy Statement to help address land-use issues. Measures taken by a developing Economy were said to include beach safety rules and regulations, voluntary trust funds for the development of a multi-hazard early warning system, training for disaster rescue teams, efforts to safeguard the safety of fishers in preparation for natural disasters, the provision of population demography information, and establishment of an integrated Tsunami warning system. An Economy reported that its National Office of Civil Defence is responsible for post natural disaster planning, which includes a decentralized logistical support system and an information system to manage resources in time of disaster. The main task of the Civil Defence was said to be to provide training to local authorities and to develop a local disaster mitigation plan. The mayor of each city was identified as responsible for Civil Defence plans relating to natural disaster relief. Similarly, in a developing Economy, the potential for marine hazards has been identified in 42 coastal districts. Apart from a National Act implemented in 2007, this Economy also reported that it has adopted local legislation on Integrated Coastal Management in 18 districts and a provincial strategic plan on coastal management in 15 provinces. Another Economy reported a study on the trends in



recurrence of extreme water levels on its coast to provide data for planning purposes. One Economy observed that after the 2004 Indian Ocean tsunami, it has taken measures to install sirens and coastal cameras. These, coupled with SMS and FAX, were said to serve as the first warning to the coastal communities of the imminent marine hazards.

Regional Initiatives

None reported.

Relevant International Initiatives (from the Survey of Organisations)

None reported.

Discussion of Organisational Perspective (from the Survey of Organisations)

There was very little Organisation assistance to Economies for ICM plans that anticipate and mitigate the effects of hazards and climate extremes. Where such actions occur at the regional level, the assistance indicated was mostly provided to developing States. Within one sub-set of the APEC Region, one NGO tends to dominate the ICM assistance delivered to Economies.

Section Summary

A strong majority of Economies reported access in development of ICZM plans that anticipate and plan to mitigate the impacts of hazards and climate extremes. In the qualitative elaboration for this question, a number of hazard mitigation initiatives were outlined; however, very few of these were clearly identified as part of an ICZM approach. Also, there was no discussion offered on ICZM initiatives to prepare for the impacts of climate change. In light of the skew towards 'moderate' achievement in this aspect of marine management, the absence of discussion on ICZM per se could suggest that little effort has actually been expended on effective ICZM policy development or planning.