

Annex I: Food Security & Food Safety Break-Out Group (Part IV, Chapters 10-15)

Participants

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Overall Points Related to Completing the Table and the Food Security and Food Safety Part of the WCR Assessment (based on summary presentation)

In general, the availability of information related to the main chapter topics were ranked as: capture fisheries (fair); aquaculture (limited); fish stock (limited); seaweed/sea-based (limited); ocean and seafood (limited); and social and socioeconomic (limited). The following topics were identified as having significant gaps: socio-economic data; marine protected area enforcement; trans-boundary issues; data for quantitative stock assessments and ecosystem-based fisheries management; larval transport; and, information regarding the value chain from supporting industries.

Several key data sources were identified for the Group of Experts to consider: FAO, CRFM, SEDAR (FMC), OSPESCA, CANARI, OECS, CLME, ICCAT, UM/RSMAS and UWI. And several key individuals were identified to be part of the Pool of Experts: Susan Singh Renton, CRFM; Manuel Perez & Bessy Aspra, OSPESCA; Raymon van Anrooy, FAO/WECAFC; and Elizabeth Mohammed, Fisheries Division – Trinidad; Robin Mahon; Milton Haughton, UWI; Terrence Phillips; Angel Gumy, FAO/Rome; Paul Medley; and Patrick McConney.

Several overall capacity limitations were identified, including:

- Lack of documented institutional knowledge
- Lack of standardized data and data management services
- Limited access to tools & scientific literature

- Lack of quantitative stock assessment expertise
- Limited harmonization across regional vs national capacities
- Limited health and safety abilities for processing products for international export

It was also noted that the Caribbean Dev Bank is willing to fund CB projects.

Topics (e.g. Capture Fisheries) and Sub-Topics (e.g. Commercial fish...) to Include in the WCR Assessment	Relevant Studies, Documents, Reports and Other Sources of Information (refer to the Inventory list)	Priority Individuals & Institutions to Engage (email; who suggested)	Information Gaps	Comments
<p>Capture fisheries (Chapter 11)</p> <ul style="list-style-type: none"> Commercial fish and shellfish stocks status and factors affecting large-scale industrial, artisanal, and recreational sectors and their socioeconomic implications Other fish and shellfish stocks status and factors affecting artisanal and recreational sectors and their socioeconomic implications Effects of pollution and the socioeconomic implications Scale, location and impact on fish stocks of illegal, unreported and unregulated fishing Projections of status of fish and shellfish over the next decade 	<p>Pelagic fishery studies: ICCAT – commercial stock status for HMS (BFT, YFT, billfish etc) www.iccat.org</p>	<p>CRFM: Susan Singh Renton - ssinghrenton@vincysurf.com (OSPESCA and CRFM are the two main fishery management bodies in the wider Carib. Assessments in Caribbean region on conch and groundfish)</p>	<p>Bycatch/discards, don't include regional coastal pelagics (blackfin tuna, wahoo, mackerels etc); indices of abundance</p>	
	<p>Pelagic fisheries: Mahon, R. and P. McConney. 2004 [ed]. Management of large pelagic fisheries in CARICOM. FAO Fisheries Technical Paper No 464, 149 p.</p>	<p>OSPESCA: Manuel Perez (general): mperez@oirsa.org (OSPESCA and CRFM are the two main fishery management bodies in the wider Carib. Assessments in Caribbean region on conch and groundfish)</p>	<p>Problems with species IDs in some reports</p>	
	<p>OSPESCA - Manuel Perez (general): mperez@oirsa.org</p>	<p>Bessy Aspra (spiny lobster):</p>	<p>Socioeconomic data</p>	

	Bessy Aspra (spiny lobster): baspra@oirsa.org.hn (*project-based position)	baspra@oirsa.org.hn		
	FAO working group on Lobster - OSPESCA: Bessy Aspra (spiny lobster): baspra@oirsa.org.hn (*project-based position), CRFM review of lobster fisheries in Wider Caribbean Reports - http://www.caricom-fisheries.com/PublicationsandDocuments/CRFMFisheryReports/tabid/85/Default.aspx	FAO/WECAFC: Raymon van Anrooy Raymon.VanAnrooy@fao.org	Assessments of dolphinfish (Mahi Mahi)	
	FAO working group on shrimp and groundfish on Guayana/ Brazil Continental Shelf (link on website broken) – Tarub Bahri tarub.bahri@fao.org	Elizabeth Mohammed (Fisheries Division – Trinidad) e.mohammed@ttst.net.tt	Indices of abundance for stock assessments	
	CRFM - Susan Singh-Renton ssinghrenton@vincysurf.com http://www.caricom-fisheries.com/	Robin Mahon – UWI – rmahon@caribsurf.com Professor of Marine Affairs and Director Centre for Resource Management and Environmental Studies (CERMES) University of the West Indies, Milton Haughton miltonhaughton@hotmail.com	Age, growth, fecundity, life history studies	leader of regional conch effort, plus all US Fisheries in US Caribbean
	Reports - http://www.caricom-fisheries.com/PublicationsandDocuments/CRFMFisheryReports/tabid/85/Default.aspx	Terrence Phillips Terrencephillips@vincysurf.com	Pollution studies	

	Documents/CRFMFisheryReports/ tabid/85/Default.aspx	urf.com		
	Research Publication: http://www.caricom- fisheries.com/PublicationsandD ocuments/CRFMResearchPaper Collection/tabid/86/Default.asp x	Angel Gumy – FAO/Rome Angel.gumy@fao.org	Impacts of fishing activities on habitat	
	Management : http://www.caricom- fisheries.com/PublicationsandD ocuments/CRFMManagementRe ports/tabid/91/Default.aspx	Paul Medley – UK contractor who does some regional resource assessments paulahmedley@yahoo.c o.uk Paul.medley@virgin.net	Ecosystem models	
	University of British Columbia – catch reconstructions for Caribbean - Daniel Pauly	Patrick McConney – CERMES	Fishery independent indices of abundance	
	IFREMER- Lionel Reynal (lionel.reynal@ifremer.fr)	GulfBase - Good source for points of contact throughout the Caribbean Region	Industrial scale fishing fleets – especially foreign fleets	
	GCFI www.gcfi.org - publication page has 60+ years of publications on science in the Wider Caribbean	Elizabeth Mohammed (Fisheries Division – Trinidad)	Fisheries bycatch and discards	
	Mahon, R. 1999. Dolphinfish fisheries in the Caribbean region. Scientia Marina. 63 (3-4): 411-420.	Lauretta Burke – WRI	Disputed boundaries for transboundary species	
	Mahon, R. and H.A. Oxenford. 1999. Precautionary assessment and management of dolphinfish	Dr. Cesar Toro, IOC UNESCO: c.toro@unesco.org	Recreational Fishing – WECAFC just established a	

	in the Caribbean. Scientia Marina. 63 (3-4): 429-438. hazel.oxenford@cavehill.uwi.edu)		group recently.	
	OECS - Sustainable Environmental Unit – Peter Murray (pamurray@oecs.org) - Ocean Governance, find OECS Fisheries Digest (historical data)	US Caribbean Fishery Management Council - Miguel Rolon	Artisanal fisheries	
	CITES regional assessments (eg conch)	FAO-WECAFC ad hoc working group on flying fish - Raymon van Anrooy Raymon.VanAnrooy@fao.org	Contributions of fishing to local economies – “value chain” eg: recreational/tourism, artisanal	
	Cuba assessment data Rodolfo Claro, Julio Baisre (chief of fisheries, GulfBase), Ken Lindeman, Georgina Bustamante (action: get OSPESCA participant list from Panama Mtg for POCs)			
	Claro, R., Y. S. Sadovy de Mitcheson, K.C. Lindeman, and A. Garca-Cagde. 2009. Historical analysis of commercial Cuban fishing effort and the effects of management interventions on important reef fishes: 1960-2005 . Fisheries Research 99(1):7-16.			
	CLME – portal IMS Paul Geerders: paul@pgcons.nl (*project-based position) Dr. Cesar Toro, IOC UNESCO:			

	c.toro@unesco.org			
	Caribbean Natural Resource Institute – Nicole Leotaud (director) assessments/socioeconomic linkages, capacity building			
	TNC, WCS (shark populations), EDF			
	Sources of fishery independent visual reef surveys: REEF – reef environmental education foundation (www.reef.org), AGGRA (Henri.valles@cavehill.uwi.edu), REEF check, Mesoamerican Barrier Reef System synoptic monitoring program (Miguel Alamilla - species@btl.net) - distribution and abundance of reef fish, Lionfish invasion			
	Honduras – shark conservation - Center for Marine Ecology (Stephen Box)			
	IWC – whaling activities in the Caribbean (St. Vincent & Grenadines)			
	Int'l Fund for Animal Welfare (Rebecca Brimley) www.ifaw.org Produce Marine Mammal Plan for the Wider Caribbean - fishing for small cetaceans			
	SCRFA (Society for the Conservation of Reef Fish Aggregations = Clearing house			

	for reef fish spawning aggregation data) - Yvonne Sadovy Sadovy de Mitcheson, Y., Cornish, A., Domeier, M., Colin, P.L., Russell, M., and Lindeman, K.C. 2008. Reef fish spawning aggregations: a global baseline. Conservation Biology 22(5):1233-1244.			
	FAO – State of World Fisheries and Aquaculture 2012(ISSN 1020-5489): http://www.fao.org/docrep/016/i2727e/i2727e.pdf			
	Reefs at Risk and Reefs at Risk Revisited			
	TNC Eco Regional Planning			
	Paddack 2009			
	Stahlings			
	Fanning, L., R. Mahon and P. McConney. [Eds.]. 2011. Towards Marine Ecosystem-based Management in the Wider Caribbean. Amsterdam University Press, Amsterdam, 426 p.			
	MAREA – Nestor Windevoxhel			
	Conch Assessments – Wesley Clerveaux (Turks and Caicos gov't – wvclerveaux@gmail.com) Also Paul Medley			
	Area 31 FAO Species update? (2008ish?) – 3 volumes			
	LAPE (Lesser Antilles Pelagic			

	Ecosystem) – 6 reports on ecosystem considerations with Fisheries - Downloadable from FAO website; Elizabeth Mohammed and Paul Fanning			
	Health and safety/sanitary aspects of fishery products for export to the EU (evaluation of capacity needs)			
	Transboundary Diagnostic Analysis via CLME program CLME website www.clmeproject.org Paul Geerders: paul@pgcons.nl (*project-based position)			
	Coral Reef Targeted Research Program (Mesoamerican Reef Program) www.gefcoral.org			
	Larval Connectivity Studies: Cowen/Sponaugle/Claire Paris			
	Millennium ecosystem scenarios within subregional CARSEA (Caribbean Assessment) – (publication from Robin Mahon) http://cbd.cbd.netdna-cdn.com/doc/meetings/mar/rw_ebsa-wcar-01/other/rwebsa-wcar-01-crfm-03-en.pdf			
	Turtle Fishery (St. Lucia, Turks and Caicos, Nicaragua, plus others): Amdeep Sanghera (MCS UK partnership project with and			

	<p>TCIG – looking at socioeconomics of turtle fishery in TCI) - amdeep.sanghera@mcsuk.org</p> <p>Peter Richardson – MCS UK – peter.richardson@mcsuk.org Aquaculture of turtles for consumption and release: Cayman Turtle Farm (info@turtle.ky) Sea Turtle Monitoring Network in St. Kitts - Kimberly Stewart - cturtlegirl@gmail.com</p> <p>Legislation: http://www.widecast.org/Legislation/Caribbean.html</p> <p>Publication: http://www.widecast.org/Resources/Pubs.html</p> <p>http://www.widecast.org/Resources/Pubs.html</p> <p>http://www.widecast.org/Resources/Docs/Fleming_Swimming_Against_the_Tide_pre-print.pdf</p>			
	<p>John MacManus – assessment of regional fisheries regulations</p>			
	<p>Flying fish: Oxenford, H.A., R. Mahon and W. Hunte (eds). 2007. Biology and management</p>			

	of eastern Caribbean flyingfish. Centre for Resource Management and Environmental Studies, UWI, Barbados. 268 pp.			
	D.C. Dunn, K. Stewart, R.H. Bjorkland, M. Haughton, S. Singh-Renton, R. Lewison, L. Thorne, P.N. Halpin. A regional analysis of coastal and domestic fishing effort in the wider Caribbean< http://www.sciencedirect.com.ezproxy.library.dal.ca/science/article/pii/S0165783609002744 > Fisheries Research, Volume 102, Issues 1–2, February 2010, Pages 60-68			
Aquaculture (Chapter 12)	FAO – Aquaculture development in LA and the Caribbean ISBN#9747313553	Working group on impacts of shrimp aquaculture (Latin Amer.)		
<ul style="list-style-type: none"> • Economic magnitude, location and species of aquaculture activities and their ecosystem and socioeconomic impacts • Impacts of chemical pollution and contamination of wild fisheries • Projections of aquaculture activities over the next decade 				
	OIE (World Animal Health) (from Lucille)			
	Datasets from conch production from Caicos Conch Farm - Dept. of Env and Maritime Affairs (Turks and Caicos) contact: Luc Clerveaux			

	UN University – Impacts of persistent organic pollution and Pers. Toxic substances – Hanneke Van Lavieren (vanlav@unu.edu) http://www.inweh.unu.edu/Coastal/CCPP/Whitegrunt/Finalreport.pdf			
	IFREMER – in Martinique – Red Drum (en.aquaculture.ifremer.fr/secteur/fish/discoveries/red-drum.)			
	Cobia Aquaculture – University of Southern Mississippi (Jeffrey M. Lotz - jeff.lotz@usm.edu) Daniel Benetti UM RSMAS (dbenetti@rsmas.miami.edu)			
	Fishery Attraction Devices (FADs) - IFREMER; JICA CRFM master plan- Milton Haughton and Peter Murray , Caribbean Fishery Management Council (Miguel Rolon)			
	Tilapia aquaculture in seawater - Dr. Barrington Brown (www.snapper.com) (from Samuel Heyliger)			
	Report on Aquaculture for the Future; WECAFC – Raymon Van Anrooy Raymon.VanAnrooy@fao.org			
Fish stock propagation (Chapter 13) <ul style="list-style-type: none"> Rebuilding depleted stocks Ecosystems and socioeconomic 	Annual report to Congress on the Status of the stocks by NOAA Fisheries –	CRFM, OSPESCA, WECAFC – regional fisheries management	Enforcement of fishery management	We are unclear on the definition of “artificial

<p>impacts of artificial propagation on natural ecosystems</p>	<p>www.caribbeanfmc.com/reports.htm</p>	<p>organizations</p>	<p>laws/regulations</p>	<p>propagation” - from FAO: Collection, rearing of eggs, larvae and fry; to achieve a better survival of offspring From Enrique Marschopp old draft “ranching and release of fish from hatcheries, transplantation of LMR to different ecosystems”</p>
	<p>SEDAR – provides assessments of US Caribbean fish stocks (www.sefsc.noaa.gov/sedar/) Gulf of Mexico Fishery Management Council (www.gulfcouncil.org); Caribbean Fishery Management Council (www.caribbeanfmc.com)</p>	<p>ICCAT – transboundary management of HMS</p>		
<p>Seaweeds and other sea-based food (Chapter 14)</p> <ul style="list-style-type: none"> Economic magnitude and location of food other than fish and shellfish and their ecosystem and socioeconomic impacts 	<p>General pub ref: http://www.canari.org/publications.asp</p>	<p>CANARI - Caribbean Natural Resource Institute – Nicole Leotaud (director) (seamoss, sea urchins)</p>	<p>Population information on sea cucumber, diamondback squid (exploratory fishery); impacts of foreign buyers</p>	
	<p>Belize is doing an assessment of sea cucumber populations (Dr. Leandra Cho – Env. Research</p>		<p>Market potential for sustainable exploitation</p>	

	Institute, Univ. of Belize – Iricketts@ub.edu.bz) Turks and Caicos is not considering Sea Cucumber fishing until studies are complete		(socioeconomics)	
	West Indian Sea Egg – FAO “Biology and Management of the White Sea Urchin” Circular #1056		Bait fisheries in the region (population, take, impact on fisheries/trophic cascades, market)	
	Smith, A. H. and F. Berkes. 1991. Solutions to the "Tragedy of the Commons": sea-urchin management in St. Lucia, West Indies. Environmental Conservation 18(2):131-136.			
	Smith, A. H. and R. Walters. 1991. Co-management of the white sea urchin resource in St. Lucia. CANARI Communication No. 38:12 pp.			
	Smith, A.H. and S. Koester, 2001. A description of the sea urchin fishery in Laborie, St. Lucia. CANARI LWI Project Document No. 4. CANARI Technical Report No. 294: pp. (41 Kb)			
	Information on seaweed cultivation & socioeconomic impacts @ Union Island in the Grenadines - Raul Rhinconé (sustainable Grenadines NGO -			

	Director: Martin Barriteau - Susgrenpm@vincysurf.com)			
Oceans and seas as sources of food (Chapter 10) <ul style="list-style-type: none"> Human dependence on the oceans for food 	FAO database on seafood consumption by country globally – we can extract Caribbean fraction(www.fao.org/economic/ess/ess-home/en/)		Subsistence level fishing, protein availability	
	FAO Food Security Statistics - http://www.fao.org/economic/ess/ess-fs/en/			
	Entangled Communities: Socioeconomic Profiles of Fishers, their Communities and their Responses to Marine Protective Measures in Puerto Rico (Volume 2: Regional Profiles) http://elciel.files.wordpress.com/2008/03/v2regionalprofiles.pdf			
Other social and economic aspects of fisheries and sea-based food (Chapter 15) <ul style="list-style-type: none"> Health benefits and contamination risks Employment and injuries Socioeconomic implications of fisheries in social structure Implementation of international fisheries agreements Long-distance transport of landed fish and shellfish 	CLME economic valuation of fisheries for Wider Caribbean Region – 200 studies for marine environment – CLME website (www.clmeproject.org)	SOLAS (Safety of Life at Sea) – International Convention	This topic is generally lacking information	
	FAO – social and economic statistics by country on fish	NOAA Fishwatch (www.fishwatch.org)	Employment from supporting	

	consumption, employment, exports, etc pointing to valuation of fisheries		industries (boat repair, boat building, processing & marketing and resale)	
	Job satisfaction in fishing – Dominican Republic (MAST - journal) (get from Robin Mahon)	Bioprospecting for pharmaceutical interests etc. International Cooperative Biodiversity Group (ICBG.org)	sustainable livelihood strategies	
	1 study in Grenadines (?)	SOCMON – Peter Espeut (Jamaica)		
	Future of Reefs in a Changing Environment (FORCE) – EU project with 18 regional partners - \$10m Euros. www.force-project.eu (will have data outputs at regional level – reef ecology, reef fish populations, livelihoods)			

Overall Capacity Needs Related to Food Security & Food Safety and How to Address Them

The following food security-related needs were identified for the region:

- Ability to export fishery products, ensure health and safety and provide sanitary aspects for exports (to the EU in particular). Currently there are no processing plants preparing fish for export.
- Non-functioning, designated MPAs, which are not enforced, due to limited human and financial resources.
- Further development for straddling stocks with regard to getting boundaries properly delineated between very close islands.
- Management of larval source/sink dynamics & connectivity. One country has breeding population and countries downstream reap benefits of other countries' management programs. In particular: lobster stock/fishery, some research has been done on this issue.
- Access to tools, literature and what overall scientific community is doing.
- Lab/research capacity to use scientific findings to inform management decisions.
- Access to international markets.
- An institution in region that teaches fisheries from practical standpoint to marketing as well on both artisanal to industrial fleet, master fisherman courses. More industry based rather than scientific.
- Seafood inspection for export: need a national authority to certify seafood for export
- Initiative to harmonize legislation in order to set regional standards
- Development of fisheries and aquaculture. Caribbean Development Bank did a study focusing on food security, which singled out development of fisheries and aquaculture (find that report). Willing to fund training programs in terms of capacity building. Opportunity for development with the Bank.
- Stronger stock assessment capabilities. Stock assessments are very data expensive, very difficult to get all the necessary data in order to conduct the fishery. There is a lack of data but also a lack of manpower to actually go out and collect the data. People trained to collect data at the landing sites however to get biological data need to buy fish so becomes a financial burden. Region needs data collection as well as a central repository for collected data. Data management and archiving, exists at national level but not at regional level. Need for central regional, database for each country to log on and enter data. One standard for data regionally so each country can enter their own into central repository. The reason why the existing (and previous) database do not function is that each country has its own method of data collection and recording. Need collection, standardization and data management. If the region had these things, next would need stock assessment capabilities.
- Reduction in personnel turnover.
- CRFM mandated by governments to do a stock assessment, each country have own assessment but CMM apply to region, not nations.
- Program to address the lack of fishery independent abundance/effort data
- Understanding of connections to apply ecosystem based management, how do all these integrate together to an entire ecosystem
- Basic monitoring activities that you can do to see impacts of aquaculture. Could include monitoring for land-based pollutants
- If food supply is going to be coming more from aquaculture, need to build up more capacity for increasing aquaculture

- Alternative livelihoods for fishermen to reduce fishing capacity to protect fish stocks
- Sustainable fisheries management transfer of knowledge to fishers
 - CRFM has groups where fishermen are stakeholders to bridge that gap
 - In many countries, not transparent how decisions are made and translated to fishermen, not institutionalized
 - Co-ops of fishermen, under form of co-management. Buying materials, vessel repairs etc, forming co-op would lower costs for all fishermen
 - More capacity building on business management, ie micro-loans
 - Over-capitalized fishery could be put towards fishery independent assessment, additionally use vessels to take tourist out, making the fish worth more in the water
 - Need to consider educational and social, traditional culture aspects of fishing. Alternatives to fishing and alternatives fishing methods