



ISSN: 1995 – 1124

**CRFM Technical & Advisory Document Series
Number 2015 / 03**

DEVELOPING THE CRFM'S FISHERIES AND AQUACULTURE RESEARCH AGENDA

**CRFM Secretariat
2015**

CRFM Technical & Advisory Document - Number 2015 / 03

Developing the CRFM's Fisheries and Aquaculture Research Agenda

CRFM Secretariat
Belize, 2015

CRFM TECHNICAL & ADVISORY DOCUMENT – Number 2015 / 03

Developing the CRFM's Fisheries and Aquaculture Research Agenda

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Correct Citation:

Mohammed, E. 2015. Developing the CRFM's Fisheries and Aquaculture Research Agenda. *CRFM Technical & Advisory Document*, No. 2015/03. 110 pp.

ISSN: 1995-1124

ISBN: 978-976-8257-10-9

Published by the Caribbean Regional Fisheries Mechanism Secretariat,
Belize and St. Vincent and the Grenadines.

ACRONYMS AND ABBREVIATIONS

ACP	African, Caribbean and Pacific states
AES	Agricultural Experimental Station
AMF	Adaptive Management Framework
ANCORS	Australian National Centre for Ocean Resources and Security
AOSIS	Alliance of Small Island States
ASM	Annual Scientific Meeting
BIOPAMA	Biodiversity and Protected Areas Management
BMZ	German Ministry for Economic Cooperation and Development
CABI	Centre for Agriculture and Bioscience International
CANARI	Caribbean Natural Resources Institute
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Community
CARIFICO	Caribbean Fisheries Co-management project
CARIFORUM	Caribbean Forum of ACP states
CARPHA	Caribbean Public Health Agency
CATS	Caribbean Aqua-Terrestrial Solutions
CC4FISH	Climate Change Adaptation in the Eastern Caribbean Fisheries Sector
CCA	Climate Change Adaptation
CCCCC	Caribbean Community Climate Change Centre
CCCFP	Caribbean Community Common Fisheries Policy
CCH	Caribbean Cooperation in Health
CCRF	Caribbean Catastrophe Risk Insurance Facility
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CERMES	Centre for Resource Management and Environmental Studies
CFMC	Caribbean Fisheries Management Council
CFTDI	Caribbean Fisheries Training and Development Institute
CHRA	Caribbean Health Research Agenda
CIMH	Caribbean Institute for Meteorology and Hydrology
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLIC	Caribbean Law Institute Centre
CLME	Caribbean Large Marine Ecosystem
CNFO	Caribbean Network of Fisherfolk Organizations
COFI	Committee on Fisheries (FAO)
COTED	Council for Trade and Economic Development
CPUE	Catch Per Unit Effort
CRFM	Caribbean Regional Fisheries Mechanism
CRMP	Certified Risk Management Professional
CTA	Technical Centre for Agricultural and Rural Cooperation
DFATD	Department of Foreign Affairs, Trade and Development (Canada)
DFID	Department for International Development (UK)
DREAL	Direction Régionale de l'Environnement, de l'Aménagement et du Logement (Regional Directorates of Environment Planning and Housing)
DRM	Disaster Risk Management
EAF	Ecosystem Approach to Fisheries
EC	Eastern Caribbean

EDF	European Development Fund
EU	European Union
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization of the United Nations
FD	Fisheries Division
FIRMS	Fisheries and Resources Monitoring System
FMP	Fisheries Management Plan
FORCE	Future of Reefs in a Changing Environment
FSG	Florida Sea Grant
GCCA	Global Climate Change Alliance
GCF	Green Climate Fund
GCFI	Gulf and Caribbean Fisheries Institute
GEF	Global Environment Facility
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
GPS	Global Positioning System
IAS	Invasive Alien Species
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICT	Information and Communications Technology
IDB	International Development Bank
IFREMER	L'Institut Français de Recherche pour l'Exploitation de la Mer (French Research Institute for Exploitation of the Sea)
IGFA	International Game Fish Association
IIR	Institute of International Relations
ILVO	Instituut voor Landbouw- en Visserijonderzoek (Institute for Agriculture and Fisheries Research)
IMA	Institute for Marine Affairs
IUU fishing	Illegal, Unreported and Unregulated fishing
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
LAPE	Lesser Antilles Pelagic Ecosystem project
LFDA	Length Frequency Distribution Analysis
LPWG	Large Pelagic Working Group
M&E	Monitoring and Evaluation
MAGDELESA	Moored fish AGregating DEvice in the LESser Antilles
MCS	Monitoring, Control and Surveillance
MPA	Marine Protected Area
MSC	Marine Stewardship Certification
MTIASCIC	Mitigating the Threats of Invasive Alien Species in the Insular Caribbean
NCD	Non Communicable Disease
NOAA	National Oceanic and Atmospheric Association
OAS	Organization of American States
OECS	Organization of Eastern Caribbean States
OSPESCA	Fisheries and Aquaculture Sector Organization of the Central American Isthmus
PA	Precautionary Approach
PoA	Plan of Action
PPCR	Pilot Programme for Climate Resilience – Regional Track
PY	Programme Year

REBYC	Reduction of Environmental Impact from Tropical Shrimp Trawling, through the Introduction of Bycatch Reduction Technologies and Change of Management
REETA	Renewable Energy and Energy Efficiency Technical Assistance Project
RFB	Regional Fisheries Body
RSWG	Reef and Slope Fish Resource Working Group
SAP	Strategic Action Programme
SCPWG	Small Coastal Pelagic Fish Resource Working Group
SGWG	Shrimp and Groundfish Resource Working Group
SIDS	Small Islands Developing States
sLMR	Shared Large Marine Resources
SME	Small and Medium Enterprises
SPS	Sanitary and Phyto-Sanitary
SSF	Small-scale Fisheries
TAC	Total Allowable Catch
TCI	Turks and Caicos Islands
TNC	The Nature Conservancy
UF	University of Florida
UK	united Kingdom
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNU	United Nations University
UVI	University of the Virgin Islands
USA	United States of America
UWI	University of the West Indies
VIMS	Virginia Institute of Marine Science
VMS	Vessel Monitoring System
WECAFC	Western Central Atlantic Fishery Commission

FOREWORD

The CRFM is mandated under its 2013 – 2021 Strategic Plan to develop a regional fisheries and aquaculture research agenda which is to be implemented through several means, including meetings of its specific Working Groups and targeted research projects and in collaboration with national, regional and international academic and research institutions. This Strategic Plan seeks to initiate implementation of the Caribbean Community Common Fisheries Policy (CCCFP) which was approved as a regional policy document by the Council for Trade and Economic Development (COTED) in October 2014.

In 2015, with the approval of 13th meeting of the Caribbean Fisheries Forum, the CRFM embarked on an exercise to develop a regional Fisheries and Aquaculture Research Agenda. This Research Agenda is intended to: (1) strengthen the science-policy interface in fisheries and aquaculture in the region; (2) facilitate more strategic and efficient deployment of the resources of the Mechanism; and (3) strengthen the linkages between the Mechanism and academic and research institutions at the national, regional and international levels.

The effort involved review of 36 regionally agreed policies, strategies and action plans, reports of the CRFM's Annual Scientific Meetings and reports of regional projects to identify and consolidate the respective research recommendations. The consolidated list of 182 research recommendations was circulated to the CRFM's 17 Member States for feedback aimed at identifying those activities of high-priority for regional implementation. Simultaneously, the full list of research recommendations was circulated to 50 academic and research institutions, regional partners and related agencies in order to identify potential research collaborators and to 10 donor agencies in order to identify potential financial sources for implementation of the Research Agenda.

The major components of the Research Agenda include a list of research activities to be implemented regionally in accordance with the CRFM's Strategic Plan (2013-2021) based on inputs of Member States and the First Special Meeting of the Executive Committee of the Caribbean Fisheries Forum, a list of potential research collaborators and a list of potential sources of funding. Regional projects and initiatives in which the CRFM is involved, that are currently being, or soon to be, implemented and which may contribute to achievement of activities under the Research Agenda, either through technical or financial assistance, are also identified.

The first draft of the Research Agenda was reviewed and endorsed, with specific amendments, by the First Special Meeting of the Executive Committee on 14 September 2015, as a provisional document for immediate implementation throughout the rest of PY 2015/2016. Additional time would be given to facilitate full participation of Member States in developing the final draft of the Research Agenda. This final draft would be submitted for consideration and endorsement of the Caribbean Fisheries Forum in 2016. Thereafter, the Research Agenda would be subject to review and update biennially, or on the request of the Caribbean Fisheries Forum (as appropriate), to consider any new developments, changing circumstances or emerging issues; the respective activities would be integrated into the CRFM's biennial Work Plan from PY 2016/2017 onwards. The CRFM's Resource Mobilization Committee will play a critical role in identifying and sourcing funds in support of implementation of the Research Agenda.

The Research Agenda is published as CRFM Special Publication No. 5. The detailed process followed in its development is published as CRFM Technical and Advisory Document – Number 2015/03. This document includes: the responses of Member States, academic and research institutions, regional partners and related agencies as well as donor agencies pertaining to the full list of 182 research recommendations; the method used to identify high-priority research activities for regional implementation; regional projects

which will contribute to achieving recommended research in general; the constraints in development of the Research Agenda; and recommendations for updating the document.

ACKNOWLEDGEMENTS

The production of the CRFM's Fisheries and Aquaculture Research Agenda would not have been possible without the support of our Member States, several national, regional and international academic and research institutions, as well as donor agencies and staff of the Secretariat. We especially would like to thank the Fisheries Departments/Divisions of Belize, Barbados, Grenada, Montserrat, St Vincent and the Grenadines, Trinidad and Tobago and the Turks and Caicos Islands for their feedback and inputs.

We also wish to express our gratitude to the following institutions and donor agencies which provided feedback: The University of the West Indies (including the Centre for Resource Management and Environmental Studies and the Faculty of Law), the French Research Institute for Exploration of the Sea, the Institute of Marine Affairs, the Caribbean Agricultural Research and Development Institute, the Caribbean Community Climate Change Centre, the Caribbean Disaster Emergency Management Agency, the Caribbean Fisheries Training and Development Institute, the Caribbean Natural Resources Institute, the Caribbean Public Health Agency, the Fisheries and Aquaculture Sector Organization of the Central American Isthmus, NOAA Fisheries Southeast Regional Office, the Aquaculture and Fisheries Group (Wageningen University), the Australian National Centre for Ocean Resources and Security (University of Wollongong), the Fisheries Department of the Institute of Agricultural and Fisheries Research (Belgium), the Fisheries Training Programme (United Nations University), the Florida Sea Grant (University of Florida), the Horticulture and Aquaculture Program (University of the Virgin Islands), the Marine Affairs Program (Dalhousie University), the Melbourne Law School (University of Melbourne), the Fisheries Centre (University of British Columbia), the University of Ghent, the Network of Co-operating Marine Laboratories (University of South Florida), the University of Southern Mississippi, the Virginia Institute of Marine Science, the Inter-American Development Bank, the National Oceanic and Atmospheric Administration, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GMBH (implementing agency of the German Government) and the Technical Centre for Agricultural and Rural Cooperation.

As well, the following members of staff of the Secretariat are acknowledged for their assistance and support: Members of the Technical Team led by Dr Susan Singh-Renton (Deputy Executive Director) and including Mr Peter A. Murray (Programme Manager Fisheries Management and Development) and Ms June Masters (Statistics and Information Analyst) who provided suggestions on possible institutions which could be engaged in the exercise and reviewed the initial list of research recommendations, Dr Singh-Renton also provided technical advice and reviewed the technical content of this document; Ms Sherlene E. Audinett (Senior Secretary) and Ms Rochelle Staine-Gill (Documentation Clerk/Typist) for assistance in finalizing and distribution of the many letters to all those consulted; Ms Pamela Gibson (Administrative Secretary) for formatting of the document and general review and editing of the content. The advice and support of the Executive Director, Mr Milton Haughton, throughout the process of development of the Research Agenda is also gratefully acknowledged.

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1.0 BACKGROUND AND RATIONALE

The CRFM has, since its inauguration in 2003, implemented an informal research agenda based on its biennial work plans, annual Scientific Meetings, specific donor-funded research projects and individual country requests for technical assistance. As the Mechanism moves towards implementation of the Caribbean Community Common Fisheries Policy (CCCFP), which was adopted by the 4th Meeting of the Ministerial Council in Antigua and Barbuda in May 2011 and approved as a regional policy document by the Council for Trade and Economic Development at its 51st Special Meeting in Suriname on 10 October 2014, it has developed a new Strategic Plan for the period 2013 to 2021 and an Action Plan for the CCCFP to guide the way forward. Underlying the key requirements to facilitate management of fisheries and aquaculture, research remains a critical component to the activities of the Mechanism in its efforts to improve the information base for decision-making.

The Strategic Plan (CRFM, 2013), and specifically Strategic Objective B2, mandates that *A regional (collaborative) fisheries and aquaculture research agenda is effectively implemented through annual scientific meetings, joint species specific Working Groups, and targeted research projects and in collaboration with national, regional and international academic and research institutions.* Such a research agenda is intended to: (1) strengthen the science-policy interface in fisheries and aquaculture in the region; (2) facilitate more strategic and efficient deployment of the resources of the Mechanism; and (3) strengthen the linkages between the Mechanism and academic and research institutions at the national, regional and international levels.

1.1 Agreed Process for Development and Finalization of the Research Agenda

The process for development, finalization and update of the Research Agenda was approved by the Executive Committee at its 24th meeting in St Vincent and the Grenadines in February 2015 (CRFM, 2015), endorsed by the Caribbean Fisheries Forum at its 13th meeting held in Grenada in March 2015 (CRFM, 2015a) and subsequently revised by the First Special Meeting of the Executive Committee held electronically on 14 September 2015 (CRFM, 2015b).

This process includes a transparent and participatory mechanism for arriving at a comprehensive list of regionally-prioritized research activities for immediate implementation, in collaboration with CRFM Member States. In addition, the process includes consultation with a range of national, regional and international academic and research institutions, regional partners and related agencies as well as donor agencies, identified by the Secretariat, so as to ascertain potential research collaborators and donor partners with which formal arrangements could be made to facilitate implementation of the finalized and approved Research Agenda. The Executive Committee and Caribbean Fisheries Forum agreed that the Secretariat would:

- (a) complete the first draft of the Research Agenda and circulate to Member States by 06 March 2015, for their review, inputs, prioritization of activities and feedback by 20 March 2015;
- (b) make the necessary amendments to the Research Agenda and circulate by 17 April 2015 to national, regional and international research and academic institutions as well as to donor partners for review, prioritization of activities and feedback as to possible areas of collaboration by 15 May 2015;
- (c) finalize the Research Agenda with all inputs and submit to the Executive Committee by 30 June 2015 for its review and endorsement for immediate implementation; and
- (d) share the final Research Agenda for 2015-2016 with the Caribbean Fisheries Forum and Ministerial Council.

Due to the limited participation of Member States in development of the Research Agenda, the Secretariat, in consultation with the Executive Committee, extended the deadline for submission of Member States' feedback from 20 March 2015 to 24 June 2015 in order to facilitate their wider participation. During this period inputs were sought simultaneously from academic and research institutions, regional partners and related agencies as well as donor agencies so as not to further delay production of the document. Consequently, it was agreed that the first draft of the Research Agenda would be submitted to the Executive Committee by 31 August 2015.

The First Special Meeting of the Executive Committee was convened electronically on 14 September 2015, to review the first draft of the Research Agenda and provide specific recommendations for its improvement, endorsement and implementation (CRFM, 2015b). The Executive Committee endorsed the Research Agenda, which contains 26 high-priority research activities identified by Member States and 8 research activities identified by the Executive Committee, as a provisional document for immediate implementation in PY 2015/2016. The Executive Committee also agreed that Member States would be given further opportunity to participate fully in development of the final draft of the Research Agenda, which is to be submitted for consideration and adoption of the Caribbean Fisheries Forum in 2016. In accordance with the CRFM's Strategic Plan, this final Research Agenda would outline the CRFM's research priorities and the respective activities would be integrated into the CRFM's biennial Work Plan from PY 2016/2017 onwards. The Research Agenda would be subject to review and update biennially, or on the request of the Caribbean Fisheries Forum (as appropriate). Such updates are necessary to ensure that the Research Agenda remains relevant i.e. new developments, changing circumstances or emerging issues are considered. As well, the CRFM's Resource Mobilization is expected to play a critical role in identifying and sourcing funds in support of implementation of the Research Agenda.

2.0 DEVELOPMENT OF THE RESEARCH AGENDA

2.1 Identification of Recommended Research Activities from Regionally Agreed Policies, Strategies and Action Plans

A number of regionally agreed policies, strategies and action plans as well as reports of the CRFM's Annual Scientific Meetings from 2004 to 2014 pertaining to regional level stock assessments (a core research activity of the Mechanism), and other relevant publications of the CRFM, were reviewed, including the:

1. Caribbean Community Common Fisheries Policy
2. Castries (2010) Declaration on Illegal, Unreported and Unregulated Fishing
3. Caribbean Regional Food and Nutrition Security Policy
4. Caribbean Coral Reefs Regional Plan of Action (2014-2019)
5. Strategy and Action Plan for Climate Change Adaptation and Disaster Risk Management in Fisheries and Aquaculture in the Caribbean Region
6. Regional Strategy on Monitoring, Control and Surveillance to Combat Illegal, Unreported and Unregulated Fishing in the CARICOM/CARIFORUM Region
7. Regional Strategy for the Control of Invasive Lionfish in the Wider Caribbean
8. CRFM-OSPESCA Joint Action Plan
9. Sub-Regional Fisheries Management Plan for Flyingfish in the Eastern Caribbean
10. Work Plan for Aquaculture Development
11. Regional Invasive Alien Species Strategy and Action Plan*
12. Diagnostic Study on Poverty Levels*
13. JICA Master Plan Study*

14. CLME+ Strategic Action Programme (SAP)*
(*additional documents identified by Member States to be reviewed)

The full list of reference documents is included in **Appendix 1**. The purpose of the review was to identify and create a list of research recommendations. Each research recommendation was aligned to the respective strategic objective(s) as outlined in the CRFM's Strategic Plan for 2013 to 2021 (see **Appendix 2**) and assigned a category (based on the subject areas) as well as corresponding keywords. For purposes of transparency, the wording in the original documents was retained in the list of research recommendations, to the extent possible, so as to remain faithful to the original interpretation. As a consequence, research recommendations ranged from the general to the very specific, with some topics repeated in various contexts or overlapping with others.

The list of research recommendations was compiled in an Excel Workbook named "CRFM Fisheries and Aquaculture Research Agenda", with separate worksheets that outlined the: (1) Background and rationale for development of the Research Agenda; (2) Instructions for review and inputs to the Research Agenda; (3) Detailed list of research recommendations linked to specific strategic objectives and reference documents, with customized columns for inputs of Member States, potential research collaborators and potential donor partners; (4) Strategic Objectives and Organizational Results of the Strategic Plan (2013 to 2021); (5) Shortened and full references of the documents reviewed. The spreadsheet at (3) also identified regional projects of relevance to specific activities of the Research Agenda and their respective status. These projects were either being implemented at the time, or were in the process of approval, or were in the planning stages.

The list (**Appendix 3**) currently contains 182 research recommendations, 72 of which pertain to the following regional instruments: Aquaculture PoA (7, 1 linked to the Diagnostic Study on Poverty Levels); CCA and DRM Strategy (14); CCCFP (6); Coral Reef PoA (4); CRFM-OSPESCA Joint Action Plan (7); Flyingfish FMP (6); Food and Nutrition Security Policy (1); IUU Fishing Declaration (1); Lionfish Strategy (6); MCS Strategy (5); Regional IAS Strategy and Action Plan (14); CLME SAP (1). The remaining 110 research recommendations are based on other CRFM publications many of which arise from consultation with stakeholders as well as recommendations of the CRFM's Annual Scientific Meetings and other CRFM research initiatives that are regional in scope (e.g. Diagnostic study on poverty levels; JICA Master Plan Study).

The list of recommendations was categorized into broad topics reflective of the various regional instruments. The number of research recommendations by category is given in **Table 1**. The table presents both the original categories shared with stakeholders as well as new categories (hereinafter referred to as "subject areas"), assigned subsequent to their response, in order to facilitate grouping of issues by ecosystem and even broader concerns (e.g. the concerns regarding the invasive lionfish are categorized under the broader concern of invasive alien species). Readers are cautioned however, in their interpretation of the contents of the table, since some documents itemized research recommendations in specific detail (e.g., assess the implications of alternative stock structure hypotheses for dolphinfish in the WECAFC region), whereas others provided general recommendations e.g. conduct research in order to ascertain the status of fish stocks.

Table 1. Number or research recommendations re-categorized.		
Subject Areas	Original Categories (identified in spreadsheet shared with stakeholders)	Number of research recommendations
Aquaculture	Aquaculture	22
Climate change & natural hazards	TOTAL	23
	<i>Climate change</i>	21
	<i>Natural hazards</i>	2
Continental shelf species, fisheries and ecosystems	TOTAL	9
	<i>Seabob</i>	1
	<i>Shrimp</i>	1
	<i>Shrimp fishery</i>	7
Food and Nutrition Security	Food and Nutrition Security	1
Gender	Gender	3
Invasive alien species	TOTAL	23
	<i>Invasive alien species</i>	15
	<i>Lionfish</i>	8
IUU fishing	IUU fishing	4
Marketing and trade	Marketing and trade	3
MCS	MCS	5
Monitoring and Evaluation	Monitoring and Evaluation	2
Pelagic species, fisheries and ecosystems	TOTAL	44
	<i>Blackfin tuna</i>	4
	<i>Dolphinfish</i>	1
	<i>Dolphinfish fishery</i>	1
	<i>FAD fisheries</i>	14
	<i>Flyingfish</i>	2
	<i>Flyingfish fishery</i>	6
	<i>Large pelagic fishery</i>	2
	<i>Large pelagics</i>	4
	<i>Small coastal pelagic fishery</i>	7
	<i>Wahoo fishery</i>	3
Policy, governance & management	TOTAL	6
	<i>EAF</i>	1
	<i>Governance</i>	1
	<i>Management</i>	1
	<i>Participatory approach</i>	1
	<i>Policy</i>	2
Recreational fisheries		6
Reef and slope species, fisheries and ecosystems	TOTAL	19
	<i>Coral reefs</i>	4

Table 1. Number of research recommendations re-categorized.		
Subject Areas	Original Categories (identified in spreadsheet shared with stakeholders)	Number of research recommendations
	<i>Deep slope fisheries</i>	<i>1</i>
	<i>Nassau grouper</i>	<i>1</i>
	<i>Queen Conch</i>	<i>9</i>
	<i>Spiny lobster</i>	<i>4</i>
Small-scale fisheries	Small scale fisheries	3
Stock assessment and fisheries analyses	TOTAL	8
	<i>Fisheries analyses</i>	<i>3</i>
	<i>Resource valuation</i>	<i>1</i>
	<i>Socio-economic performance</i>	<i>1</i>
	<i>Stock assessment</i>	<i>3</i>
Under- or unutilised species	Under- or unutilised species	1
GRAND TOTAL		182

2.2 General Research Areas Identified

The general areas of interest for those subject areas with three or more recommendations are listed below. Full details for all categories are given in **Appendix 3**.

2.1.1 Aquaculture

- determining the aquaculture potential of different CRFM Member States to inform ecological, social and financial viability;
- conducting national GIS-based surveys of biophysical, infrastructural and institutional factors to assess aquaculture potentials of individual countries to guide decision-making for development of the sector;
- determining the commercial viability (through marketing surveys and other means) and technical viability of indigenous/native (preferred) species, ornamental fish species (both freshwater and marine), low-trophic level species (e.g., sea urchins, sea cucumbers, blue crabs) and specific marine species (e.g., groupers and mangrove oysters) for sustainable aquaculture production.
- testing the feasibility of small-scale tilapia aquaculture and similar activity for commercial scale aquaculture through pilot projects, to determine their applicability for different Member States;
- conducting studies in support of diversification of aquaculture into integrated multi-trophic aquaculture and aquaponic systems;
- research into seed production, production technologies, environmental measures, markets and health measures associated with aquaculture
- assessing the technology needs of energy supply, including use of renewable energy, and cultivation;
- research on feeds used in aquaculture to facilitate cost-effective, local-feed substitution; improved digestion of feed through experimentation with fermentation techniques, improving feed quality to optimize growth for a given protein content while reducing costs, experimentation with pelletized feed so as to reduce the unutilized portion of the feed that causes water contamination.

2.1.2 Climate change and natural hazards

- (a) developing post-harvest processing and marketing capacity to use unfamiliar, altered season and more abundant species;
- (b) research in alternative sources of energy (green technology, renewable energy such as solar, wind, biofuels) for fishing vessels and processing plants;
- (c) research into improving vessel design and fuel efficiency in engines for fishing vessels, fish processing plants and fish farms;
- (d) research to identify coral species that are adaptive to warming sea temperatures and other factors;
- (e) research into waste management, resource economics and remote sensing;
- (f) identification of alternative livelihoods for fishers and other vulnerable groups in the coastal zone so as to build resilience and reduce vulnerability to climate change;
- (g) developing methodologies for aquaculture of indigenous species (fresh water, brackish water and marine) to build coastal community resilience to climate change and relieve fishing pressure on marine living resources; (note link with aquaculture subject area)
- (h) risk assessment and mapping of natural disasters within fisheries and aquaculture sectors;
- (i) assessment of the vulnerability and risks associated with climate change;
- (j) research on the link between climate and health with emphasis on disease and impacts;
- (k) developing models to forecast change in distribution, abundance and production of commercially important fisheries and marine ecosystems, as well as social and economic impacts based on different climate scenarios to facilitate planning and decision making in disaster risk management;
- (l) gender analyses to demonstrate usefulness in policy, planning and management; (note link with gender subject area);
- (m) economic valuation of fisheries and aquaculture (and related ecosystems) as well as mapping and valuation of coastal ecosystems and habitats (including coral reefs, seagrass beds and mangrove systems) for decision-making in respect of altered coastal habitat;
- (n) standardizing and harmonizing risk management methodologies and practices;
- (o) baseline studies to identify the strengths and weaknesses of disaster reduction programmes.

2.1.3 Continental shelf species, fisheries and ecosystems

- (a) comparative study of Guyana and Suriname seabob fisheries and management regimes;
- (b) stock assessment of main *Penaeus* spp.
- (c) survey of bycatch in trawl fisheries;
- (d) improve existing assessment models to provide more reliable management advice – considering new hypotheses of stock structure, improved morphometric parameters, considering changing catchabilities and standardized catch rates as well as historical time series data, growth parameters, need for species specific models, hydrometric data as a growth/recruitment index.

2.1.4 Invasive Alien Species

- (a) socio-economic impact surveys related to lionfish invasion;
- (b) assess and develop safe lionfish harvesting strategies for seafood markets;
- (c) identify and assess existing technologies, and develop new technologies, to control the lionfish invasion;
- (d) research to determine the current and long-term impacts of invasive species (such as lionfish and *Sargassum*) on fishing industries and regional fisheries in the Caribbean;
- (e) overview of current understanding and knowledge of the biology and ecology of lionfish;
- (f) overview of best management control practices for lionfish;
- (g) studies on ciguatera and other potential food-borne illness that may be associated with lionfish;
- (h) assess survey methods to standardize lionfish monitoring;

- (i) develop a reference list of IAS species and determine the respective baseline status using historical and other data;
- (j) identify priority IAS species through risk assessment pathway analysis and niche modeling for monitoring, containment and control efforts;
- (k) identify priority habitats impacts by IAS for rehabilitation or restoration;
- (l) develop and implement national monitoring plans for IAS, including development of protocols for reference collection, control of IAS species and rehabilitation or restoration of impacted habitats;
- (m) develop and implement a regional research plan for IAS, including development and strengthening of linkages with regional and international taxonomic institutions;
- (n) assess environmental and economic impacts of IAS and risks associated with biological control agents;

2.1.5 IUU Fishing

- (a) improved methodologies and approaches to harmonize and enhance the reliability of data collection concerning IUU fishing;
- (b) specific research on IUU fishing linked with queen conch and spiny lobster fisheries;
- (c) assessment and management of overcapacity and IUU fishing.

2.1.6 Monitoring, Control and Surveillance (MCS)

- (a) study on bi-lateral and multi-lateral agreements among CARIFORUM States for fisheries protection and MCS activities;
- (b) regional study to amend/update fisheries sector legislation for MCS;
- (c) regional cost-benefit analysis of MCS strategic options;
- (d) identification of harmonized MCS measures for conch and lobster, including enforcement measures;
- (e) regional study to improve public awareness and involvement in MCS.

2.1.7 Pelagic species, fisheries and ecosystems

The respective research recommendations ranged from the species specific (blackfin tuna, dolphinfish, flyingfish, wahoo) to the general fisheries categories (e.g., FAD fisheries, large pelagic fisheries and small coastal pelagic fisheries). The broad areas of interest are as follows:

- (a) Blackfin tuna – assessment of the impacts of FADs on the blackfin tuna fishery; identification of blackfin tuna migration patterns and studies on the genetics, growth, reproduction, maturity and spawning aggregations of the species;
- (b) Dolphinfish – assessment of alternative stock structure hypotheses in the WECAFC region on stock status; monitor trends in landings, catches and catch rates to identify stock status based on a regional collaborative approach to management that involves the USA, Venezuela and French Territories and the respective data mining to acquire historical time series data on catches and fishing effort [to improve the quality of assessment models and reliability of their outputs].
- (c) Flyingfish – assessment of the impacts of sea and land-based human activities on the habitats, life cycles and food webs of flyingfish as well as the productivity of the related marine ecosystem; development of a research plan for a synoptic [biomass] survey; bio-economic analysis of flyingfish in the context of the EAF; identification of the optimal fishing capacity for achieving the stated management goals in the Sub-regional flyingfish FMP; risk analysis of climate change and variability on flyingfish and associated large pelagic fisheries and related ecosystems; sub-regional costs and earnings study on the flyingfish fishery; identification and refinement of operational objectives, indicators and reference points for monitoring and evaluation of agreed management priorities; socio-economic study of flyingfish fishers and processors.
- (d) Wahoo – validation of presumed annual growth rings to facilitate otolith-based ageing of the species to improve assessment of the stock status (use of growth parameters and the age structure

of catches); implement a tagging program to generate data and information on migrations and other biological/ecological characteristics; monitor trends in landings, catches and catch rates to identify stock status based on a regional collaborative approach to management that involves the USA, Venezuela and Netherland Antilles and the respective data mining to acquire historical time series data on catches and fishing effort [to improve the quality of assessment models and reliability of their outputs].

- (e) FAD fisheries – estimation of fishing capacity around FADs and impacts of FADs on overall exploitation levels in pelagic fisheries and population dynamics, biology and ecology of the respective resources; estimation of optimal FAD densities for sustainable fisheries; assessment of the socio-economic aspects of FAD fisheries; identification of social customs that can characterize formal and informal FAD governance arrangements including co-management arrangements; research on FAD technology to minimize FAD submersion and loss and to maximize their cost-effectiveness as well as to minimize the capture of small/juvenile fish; research on best FAD fishery practices to minimize the capture of small/juvenile fish; research on markets, product development and sanitary and phyto-sanitary as well as environmental degradation, climate change and variability issues in FAD fisheries;
- (f) Large pelagic fisheries – improve existing ECOPATH model developed under the LAPE Project and use the updated model to explore different management options for pelagic fisheries and to develop or identify appropriate ecosystem indicators for the pelagic ecosystem; determine the socio-economic value of large pelagic fisheries; assess the impacts of sargassum [outbreaks/invasions] on large pelagic species (especially dolphinfish and wahoo) as well as the impacts of climate change, climate variability and other environmental changes on large pelagic species and related ecosystems;
- (g) Small-coastal pelagic fisheries – research on the biology and ecology of the respective resources (including fish movement and migration patterns); assessment of the social and economic importance of small coastal pelagic fisheries; identification of spawning periods to inform development of management strategies; assessment of the level of sharing of the respective stocks among countries; examine linkages between vulnerability to fishing gear and level of maturity; examine the vulnerability of scads and other small coastal pelagics to environmental conditions and impacts on management approaches.

2.1.8 Policy, governance and management

- (a) research to determine the effects of environmental changes on fisheries and aquatic ecosystems, to fulfil management objectives under the CCCFP;
- (b) to develop and coordinate integrated and sectoral research strategies in support of the implementation of broader ocean governance in the region;
- (c) survey to monitor Member States' compliance with WECAFC recommendations concerning spawning aggregations;
- (d) identification of mechanisms to move participation of fisherfolk in the decision-making process from consultation to equitable decision-making;
- (e) regular reviews and analysis of policies (to assess their impacts on small-scale fisheries), and of policy processes (to assess the extent to which small-scale fisheries interests are being included);

2.1.9 Recreational fisheries

- (a) identification of target species for recreational fisheries considering changes in species distribution and abundance associated with climate change;
- (b) socio-economic assessment of recreational fisheries as well as studies on the biology of recreational species and assessment of the respective stocks, economic valuation of the recreational fishing sub-sector;

- (c) assessment of physiological impacts of tag and catch or release programmes particularly on post-release mortality with emphasis on dolphinfish and wahoo.

2.1.10 Reef and slope species, fisheries and ecosystems

- (a) coral reefs - assessment of vulnerability of coral reefs to the impacts of climate change and research to determine countries' resource dependency and links to vulnerability, identifying tools and approaches to integrate social and ecological resilience ;
- (b) deep slope fisheries – obtaining baseline data to determine the respective fishery potential;
- (c) Nassau grouper – regional stock assessment of the species and assessment of trade in the species;
- (d) queen conch – development of regional factors for converting the weights at various levels of processing to whole weights, improving length-weight parameter estimates to refine TAC estimates for the Grenadines, monitoring of population through analysis of plankton samples and quantifying deep-water stocks, socio-economic analysis of queen conch fisheries, improving estimates of catches including catches from IUU fishing, development of an operating model to guide queen conch to guide and test harvest strategies and stock assessments, GIS mapping of queen conch habitat and fishing grounds.
- (e) spiny lobster – improve stock assessments by incorporating ecosystem and environmental information as well as considering the source-sink configuration of larval production and settlement and to develop appropriate harvest control rules , develop morphometric factors for converting the weights at various levels of processing to whole weights, develop fishery-independent techniques to monitor distribution and abundance of spiny lobsters.

2.1.11 Stock assessment and fisheries analyses

- (a) detailed analyses of the development, status and importance of the fisheries sector as a whole;
- (b) valuation (social and economic) of the fisheries sector and related activities ;
- (c) assessment of the development potential of underutilized and unutilized species;
- (d) collaboration with OSPESCA in research on species and fisheries of mutual interest;
- (e) research to ascertain the status of fish stocks, particularly of main target species in artisanal fisheries, and determining the nature and levels of exploitation.

2.3 Engaging CRFM Member States to Participate in Development of the Research Agenda

Since it would be unfeasible to implement the extensive list of research recommendations simultaneously, guidance of the 17 CRFM Member States was sought to prioritize the respective activities in the Excel workbook based on their importance at the national level, which in turn would inform prioritization at the regional level. High-priority regional research activities so identified would be implemented with urgency, subject to the availability of resources. The respective 17 Member States are Anguilla, Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago and Turks and Caicos Islands. A copy of the initial circular sent to the Chief Fisheries Officers and Directors of Fisheries is attached at **Appendix 4**. Member States were requested to prioritize each research recommendation based on the following scale: 0 – not applicable; 1- high-priority; 2 – medium to high priority; 3 – medium priority; 4 low to medium priority; 5 – low priority. Four requests were made, the first on 06 March (initial circular) with deadline date of 20 March for feedback; the second (with recommendations from documents marked * in **Section 2.1** included) on 15 April with deadline date of 24 April, the third on 05 June with the deadline date extended to 12 June, and the fourth based on consultation with the Executive Committee to 24 June 2015 - the latter three requests being made through email dispatched by the Programme Manager, Research and Resource Assessment.

The assumptions taken in seeking feedback of Member States were that: (a) regionally **agreed** fisheries and aquaculture management instruments were already subject to review and consultation with stakeholders at the national and regional levels; (b) recommendations of other CRFM initiatives such as the Annual Scientific Meetings as well regional projects were already subject to review and approval by the Caribbean Fisheries Forum and consequently used in formulating the Research Agenda to inform national level decision-making; (c) already established in-country linkages between fisheries management authorities and resident research and academic institutions aimed at implementation of national Research Agenda would not be negatively impacted.

2.4 Engaging Academic and Research Institutions and Regional Partners

In order to ascertain potential research collaborators, the Excel workbook containing the list of research recommendations was circulated to 50 national, regional and international academic and research institutions as well as regional partners within the CARICOM framework and other relevant institutions as listed below. These institutions were identified by the CRFM Secretariat based on: networking arrangements; previous CRFM initiatives; specific expressed interest in collaboration with the CRFM on the part of the institution or agency; and existence of the relevant research expertise pertinent to the range of topics contained in the list of research recommendations. The initial correspondence was sent between 06 and 12 May with a deadline date of 01 June 2015 for feedback. A reminder was sent on 27 and 28 May 2015 and another call for feedback was made on 05 June with the deadline date extended to 12 June. A copy of the form letter is attached at **Appendix 5** and the detailed contact information of the academic and research institutions as well as regional partners to which this letter was sent is provided in **Appendix 6**. These institutions were requested to prioritize possible areas of collaboration either at the level of each research activity or at the original category level, using the same scale provided to CRFM Member States, and to identify the possibility of any funding assistance (responses were either “yes” or “no”). The institutions marked with (*) are those with which the CRFM already has a formal arrangement in place to facilitate cooperation in areas of mutual interest and or capacity development while those that are in emboldened text are the ones which provided feedback, albeit not all positive.

National and Regional Academic and Research Institutions

Anton de Kom Universiteit van Suriname (University of Suriname)

Bellairs Research Institute (University of McGill)

Caribbean Law Institute Centre

Caribbean Marine Research Centre – Perry Institute for Marine Science

Centre for Marine Sciences – Discovery Bay Marine Laboratory

The University of the West Indies (UWI - Mona, Cave Hill and St. Augustine Campuses)*

Centre for Resource Management and Environmental Studies (UWI, Cave Hill Campus)

Faculty of Law (UWI, Cave Hill Campus)

Institute of International Relations (UWI, St Augustine Campus)

French Research Institute for Exploration of the Sea (IFREMER)*

H. Lavity Stouff Community College

Institute of Marine Affairs

University of Belize*

University of Guyana

University of Havana

University of Trinidad and Tobago

Other Regional Partners or Institutions

Caribbean Agricultural Research and Development Institute (CARDI)

Caribbean Community Climate Change Centre (CCCCC)
Caribbean Disaster Emergency Management Agency (CDEMA)
Caribbean Fisheries Training and Development Institute (CFTDI)
 Caribbean Institute for Meteorology and Hydrology (CIMH)
Caribbean Natural Resources Institute (CANARI)
Caribbean Public Health Agency (CARPHA)
Fisheries and Aquaculture Sector Organization of the Central American Isthmus (OSPESCA)*
 Ocean Governance Unit, OECS Commission
Southeast Regional Office (National Oceanic and Atmospheric Administration – Fisheries)¹

International Academic and Research Institutions

Aquaculture and Fisheries Group (Wageningen University)
Australian National Centre for Ocean Resources and Security (University of Wollongong)*
Fisheries Department, Institute of Agricultural and Fisheries Research (Belgium)²
Fisheries Training Programme (United Nations University)*
Florida Sea Grant Program (The University of Florida)*
Horticulture and Aquaculture Program (University of the Virgin Islands, St Croix)
 Institute of Aquaculture (University of Stirling)
Marine Affairs Program (Dalhousie University, International Ocean Institute)*
Melbourne Law School (The University of Melbourne)
 School of Marine Science and Technology (Newcastle University)
 Stockholm Environment Institute
 The Centre for Marine Science (St Lucia Campus, University of Queensland)
The Fisheries Centre (University of British Columbia)
University of Ghent
University of South Florida (Network of Co-operating Marine Laboratories)
University of Southern Mississippi
 University of Sussex
Virginia Institute of Marine Science

Other International Institutions

BioMar Group (EU Feed Company)
 Copens Scientific (EU Feed Company)
 Le Gouessant Aquaculture (EU Feed Company)
 Skretting Group (EU Feed Company)
 Food and Agriculture Organization
 The Nature Conservancy

2.5 Engaging Donor Agencies

In order to identify potential donor partners which the CRFM's Resource Mobilization Committee could approach to source funds for implementation of specific activities in the Research Agenda, the Excel workbook containing the list of research recommendations was also circulated to 10 donor agencies (below) in early May 2015 for feedback by 01 June 2015. This deadline date was eventually extended to 12 June 2015. These donor agencies were identified by the Secretariat based on: networking arrangements; previous CRFM initiatives and tendency to fund studies pertinent to the range of topics

¹ *Inputs and feedback facilitated through the Florida Sea Grant Programme, University of Florida*

² *Inputs facilitated through sharing of the research agenda with this department by the University of Ghent*

contained in the list of research recommendations. A copy of the form letter is attached at **Appendix 7** and the detailed contact information of donor agencies is provided in **Appendix 8**. These institutions were requested to prioritize possible areas of funding at the level of each research activity or at the broader original category level and to identify the availability of any associated technical assistance. The institutions in emboldened text are the ones which provided feedback.

African, Caribbean and Pacific Group of States (ACP)

Caribbean Development Bank (CDB)

Department of Foreign Affairs, Trade (Canada)

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GMBH

Global Environment Facility (GEF)

Inter-American Development Bank (IDB)

Japan International Development Agency (JICA) - Belize Office and Research Institute

National Oceanic and Atmospheric Administration (NOAA)

Organization of American States (OAS)

Technical Centre for Agricultural and Rural Cooperation (CTA)

3.0 ANALYSIS OF FEEDBACK FROM MEMBER STATES, ACADEMIC AND RESEARCH INSTITUTIONS AND REGIONAL PARTNERS AND DONOR AGENCIES

3.1 Regional Research Priorities

3.3.1 – CRFM Member States’ Inputs

As at 24 June 2015, of the 17 CRFM Member States, 3 (Montserrat, St Vincent and the Grenadines and Turks and Caicos Islands) provided feedback on the full list of 182 recommendations and 4 (Barbados, Belize, Grenada and Trinidad and Tobago) provided feedback on the initial, shorter list of 144 recommendations. The individual responses of CRFM Member States are given in **Appendix 9**, while specific comments of Member States are provided in **Appendix 10**. These comments were adjusted to reflect only those that could contribute to refinement of the respective research recommendations and to highlight research already, or currently, being conducted nationally.

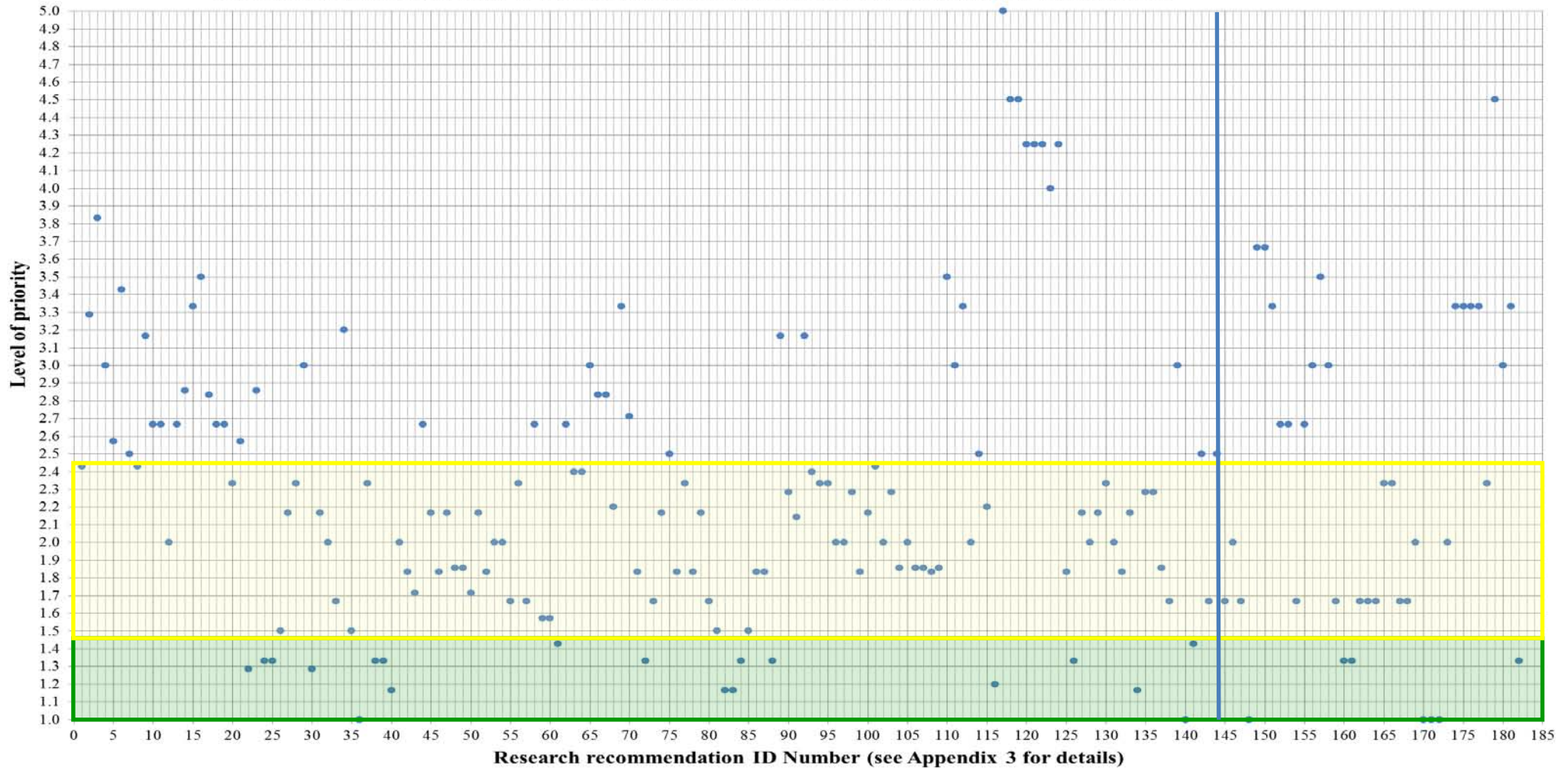
Identification of high-priority regional research activities to be considered in the Research Agenda (CRFM, 2015c) was initially based solely on the responses of Member States. As a consequence, full participation by all Member States in development of the Research Agenda was critical towards increasing the likelihood that regional priorities emerge from the process. The priority assigned by each of the responding Member States to each of the 182 research recommendations was used to estimate a corresponding weighted average priority. Activities that were identified as ‘not applicable’ or for which there were no responses were not included in the analysis.

Taking into consideration the weighted averages to one decimal point, 26 of the recommendations scored high priority (scores from 1.0 to 1.4); 94 of the recommendations scored medium to high priority (scores from 1.5 to 2.4); 47 of the recommendations scored medium priority (scores from 2.5 to 3.4); 11 of the recommendations scored low to medium priority (scores from 3.5 to 4.4) and only 4 recommendations scored low priority (scores from 4.5 to 5) – (**Table 2**). The high priority activities and medium to high priority activities are highlighted in the green and yellow boxes respectively in **Figure 1**. However, only the high priority activities are included in the Research Agenda (CRFM, 2015c).

Table 2. Prioritization of the full list of 182 research recommendations by subject area.						
Subject Areas	High	Medium to High	Medium	Low to Medium	Low	TOTAL
Aquaculture	0	3	17	2	0	22
Climate change & natural hazards	6	9	8	0	0	23
Continental shelf species, fisheries and ecosystems	0	0	0	5	4	9
Food and Nutrition Security	0	0	1	0	0	1
Gender	0	0	1	2	0	3
Invasive alien species	9	14	0	0	0	23
IUU fishing	2	2	0	0	0	4
Marketing and trade	0	3	0	0	0	3
MCS	0	4	1	0	0	5
Monitoring and Evaluation	0	2	0	0	0	2
Pelagic species, fisheries and ecosystems	1	29	13	1	0	44
Policy, Governance & management	1	4	1	0	0	6
Recreational fisheries	0	2	3	1	0	6
Reef and slope species, fisheries and ecosystems	2	17	0	0	0	19
Small-scale fisheries	0	2	1	0	0	3
Stock assessment and fisheries analyses	4	3	1	0	0	8
Under- or unutilised species	1	0	0	0	0	1
TOTAL	26	94	47	11	4	182

Figure 1. Prioritized List of 182 Research Recommendations based on the weighted average responses of 7 CRFM Member States

(left of blue line is based on responses of 7 Member States and right of blue line is based on responses of 3 Member States)



Priority Levels: 1 - 1.4 = High; 1.5 - 2.4 = Medium to High; 2.5 - 3.4 = Medium; 3.5 - 4.4. = Low to Medium; 4.5 - 5 = Low

3.3.2 – Inputs of the First Special Meeting of the Executive Committee

The First Special Meeting of the Executive Committee of the Caribbean Fisheries Forum (CRFM, 2015c), reviewed the draft Research Agenda and agreed that specific research activities on aquaculture and the *Sargassum* seaweed should be included in the document, even though such activities were not identified as high regional priority based on feedback from the seven Member States. The Executive Committee's decision was based on the need to undertake research on matters that have been receiving the recent and urgent attention of policy makers in the region. Consequently, as agreed by the Executive Committee, activities identified for implementation in years 1 and 2 of the Aquaculture Plan of Action (PoA – See Appendix 1) were included in the Research Agenda. These activities pertain to research recommendation numbers 3, 4, 9 and 10 in **Appendix 3**. As well, research activities pertaining to the *Sargassum* seaweed, research recommendation numbers 31, 71, 78 and 80 in **Appendix 3**, were included in the document.

3.2 Potential Research Collaborators

Of the 50 national, regional and international academic and research institutions, regional partners and related agencies consulted, 26 provided feedback on the 182 research recommendations (**Appendix 11**). The procedure used for identifying potential research collaborators was a simple one, based on linking the feedback from the respective institutions, partners and agencies with the high-priority regional research activities identified by Member States. Those institutions which scored these research activities as being either high, or medium to high, importance to themselves were identified as potential research collaborators – 14 potential collaborators were identified through this process and are listed in the Research Agenda (CRFM, 2015c).

3.3 Potential Sources of Funding

3.3.1 Academic and Research Institutions, Regional Partners and Related Agencies

Of the 26 responses from academic and research institutions, regional partners and related agencies, nine indicated areas of possible funding or willingness to seek funding (IFREMER, IMA, CARDI, CCCCC, CARPHA, OSPESCA, the Florida Sea Grant Program, the University of Southern Mississippi, the Melbourne Law School) – **Appendix 12**.

Otherwise, the majority of academic, research and related institutions provided no response regarding the availability of funding (which is interpreted as non-availability of funding), while the Australian National Centre for Ocean Resources and Security, the Caribbean Disaster Emergency Management Agency and the Virginia Institute of Marine Science (VIMS) all explicitly indicated that there was no available funding to implement the research recommendations of mutual interest. The Virginia Institute of Marine Science expressed specific interest in collaborating with the CRFM to develop research/grant proposals in areas of mutual interest while OSPESCA indicated that it was in the process of seeking funds from donor agencies to facilitate implementation of research in areas of mutual interest. The Fisheries Centre (University of British Columbia) pointed to opportunities for funding research through Canada's Caribbean Program accessible through the Department of Foreign Affairs, Trade and Development Canada³. The Florida Sea Grant (FSG) Program indicated specific areas of available funding in its inputs to the Research Agenda but noted its constraints and those of the NOAA to directly fund research outside of the US territories in the Caribbean. It indicated its support for co-ordination of collective research such that projects and results can be used more broadly or be more applicable or relevant to the region. The

³ Note that there was no feedback from the Department of Foreign Affairs, Trade and Development Canada under 3.3.2

Fisheries Training Program (United Nations University) also expressed interest in being a co-funder, or co-applicant for funds, to facilitate activities of mutual interest related mainly to capacity-building.

3.3.2 Donor Agencies

Of the ten donor agencies consulted, four provided feedback and of these agencies only one, the Technical Centre for Agricultural and Rural Cooperation (CTA), responded positively in respect to the possibility of funding to implement specific research activities (*Appendix 12*). It was intended to use the same procedure as described under *Sub-section 3.2* to identify potential donor partners, but this was not necessary under the circumstances.

The other three agencies that provided feedback were NOAA, GIZ and IDB. The GIZ indicated that it is not engaged in funding research, however, as an implementing agency of the German Government, it supports commissioning parties and partners in the CARICOM Region in their efforts to resolve local, national and/or regional challenges and in the implementation of sustainable development measures. Consequently, it may provide support only as commissioned by the respective donor, which, in the majority of cases, are Ministries of the German Federal Government. Although GIZ is not able to provide financing for implementation of the Research Agenda it encouraged the exchange of information and knowledge between institutions and indicated that it was looking forward to incorporating results of the CRFM's research into its ongoing cooperation with CARICOM/CARPHA. The IDB applauded the regional coordination efforts in the respective sectors and reminded that it places high priority to support its members in plans to shift towards more effect science-based fisheries management policies and measures. It advised of a grant to the Government of Haiti that is about to be approved for sustainable artisanal fisheries development that includes a robust fisheries data collection and research component. Given current funding constraints however, the IDB's priority is to support grants that make a direct contribution to its operational program in fisheries, which is limited in scope. Consequently, the IDB advised that it was unable to identify research topics of immediate interest in the CRFM's Research Agenda at the time.

3.3.3 Regional projects and initiatives

Funding, as well as technical assistance, is also available under several planned, recently approved and soon to be implemented regional projects and initiatives in which the CRFM is involved, to implement some of the research recommendations (*Appendix 12*): (1) Caribbean Large Marine Ecosystem Project: Catalysing Implementation of the Strategic Action Programme for the Sustainable Management of shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+ Project – Second Phase); (2) Pilot Programme for Climate Resilience – Regional Track (PPCR); (3) Climate Change Adaptation in the Eastern Caribbean Fisheries Sector (CC4FISH Project); (4) Sustainable management of bycatch in Latin America and Caribbean trawl fisheries (REBYC-II LAC); (5) Promoting Sustainable Energy Use in the Fisheries Sector (CARICOM-GIZ REETA - Supporting Institutional Structures to promote Renewable Energy and Energy Efficiency in the Caribbean Region – Fisheries Sub-project); and (6) Caribbean Fisheries Co-management Project (CARIFICO Project). See *Section 4* for details.

4.0 REGIONAL PROJECTS AND INITIATIVES CONTRIBUTING TO GENERAL RESEARCH IN FISHERIES AND AQUACULTURE

At the time of development of the Research Agenda there were already several regional projects and initiatives either planned, recently approved, or being implemented in which the CRFM is involved, that could contribute, or are contributing, to achievement of some of the research recommendations in *Appendix 3* (including those high-priority recommendations that are incorporated in the Research

Agenda). These projects and initiatives and the respective research recommendations to which they are likely to contribute are listed in *Appendix 13*.

The regional projects are as follows:

CLME+ (Second Phase): This project was approved by the Global Environment Facility in March 2015. It is a 5-year project that aims to facilitate the implementation of the 10-year politically endorsed Strategic Action Programme for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME+ SAP). The project will focus on establishment and implementation of governance mechanisms and therefore will contribute to the broad governance activity #182. It is also expected to address some of the research recommendations pertaining to the flyingfish, lobster and shrimp and groundfish fisheries (with direct linkages with recommendations concerning reef and slope, pelagic and continental shelf species, fisheries and ecosystems). The Project is being executed by a Program Coordination Unit in Colombia. The CRFM is implementing the Flyingfish Sub-project, while the FAO is implementing the Shrimp and Groundfish Sub-project and OSPESCA is implementing the Lobster Sub-Project. All CRFM Member States are included in the list of participating countries which extends to Latin America and Brazil.

PPCR: The Investment Proposal for this 4-year project was approved by the Inter-American Development Bank (IDB) in May 2015. The overall executing agency is the Mona Campus for Research and Innovation (UWI), in partnership with eight regional organizations. The project is focusing on improving geospatial data and management for adaptation planning, sea level rise and storm surge impact analysis; consolidating and expanding the regional climate network and global platform linkages; downscaling and expanded climate projection models and high resolution maps; and applied adaptation initiatives. The CRFM is implementing the Applied Adaptation Initiatives Component – Marine Sub-Component. The main research activities focus on fisheries and marine ecosystem assessments and analyses as well as socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf), in order to provide management advice for decision-making in climate change adaptation and disaster risk management in fisheries. There is preference by the funding agency for implementation of this project in countries which are already implementing the national-track of the PPCR, namely: Jamaica, Haiti, Dominica, Saint Lucia, Grenada and St Vincent and the Grenadines. However, it is recognized that analyses on the continental shelf fisheries and ecosystems would require inclusion of additional CRFM Member States.

REBYC-II LAC: This project was approved by the Global Environment Facility in March 2015. The project addresses the barriers to better management of bycatch in support of sustainable development of the trawling sector and the people who depend on and are influenced by it, including also other fisheries. The project focuses on improving institutional and regulatory frameworks for shrimp/bottom trawl fisheries and co-management; strengthening by-catch management and responsible trawling practices within an EAF framework; and promoting sustainable and equitable livelihoods through enhancement and diversification. The project is being executed by the Western Central Atlantic Fishery Commission in partnership with the governments of six countries with significant trawl fisheries, including two CRFM Member States, Suriname and Trinidad and Tobago.

CARIFICO Project: This five-year project was inaugurated in May 2013. It is being implemented as a bilateral technical co-operation project between the Government of Japan, through the Japan International Cooperation Agency (JICA), and six CRFM Member States that are also Members of the Organization of Eastern Caribbean States (Grenada, St Vincent and the Grenadines, Saint Lucia, the Commonwealth of Dominica, St Kitts and Nevis and Antigua and Barbuda). The project focuses on development and sustainable management of fisheries that use fish aggregating devices (FADs), with particular emphasis

on FAD fishery governance through a participatory, co-management approach. Anticipated outputs include appropriate fishery management rules and regulations which govern the use, deployment and maintenance of FADs, a co-management mechanism for enforcement of rules and regulations, improved systems for fisher registration and fishing vessel licensing, establishment of a data collection system to facilitate management decision-making on FAD fisheries and capacity-building (CRFM, 2013b). The Project will also share best practices in FAD fisheries, including those practices that promote sustainable fishing strategies. Consequently, the CRFM is a collaborator on the project to facilitate the sharing of lessons learnt, and in particular best practices in co-management, throughout the sub-region.

CARICOM-GIZ REETA (Fisheries Project): This GIZ REETA Project, *Supporting Institutional Structures to promote Renewable Energy and Energy Efficiency in the Caribbean Region*, is a four-year Project that forms part of the German Development Co-operation in the Caribbean and is financed by the German Ministry for Economic Cooperation and Development (BMZ). The project, which was launched in October 2013, supports the Energy Unit in the CARICOM Secretariat to develop and implement the Caribbean Sustainable Energy Roadmap and Strategy in member countries. A proposal for a 2-year project on fisheries, *Promoting Sustainable Energy Use in the Fisheries Sector*, was developed by the CARICOM Energy Unit in 2015 for implementation in three CARICOM Member States. This Project is intended to be steered by the CRFM with the broader GIZ-REETA Project providing technical and capacity assistance during the formulation and execution phases. Approval of the project is pending.

CARICOM-Cuba Technical Cooperation in Aquaculture: This five-year project was approved for implementation with the requisite funding from the Government of Cuba in 2015. The project will provide technical assistance and support for intensive farming of tilapia and Chinese carps, including administration of farming systems, production of fingerlings for farmers and development of a comprehensive system of Aquaculture Sanitary and Biosafety standards. The Project is to be piloted in three or four CARICOM Member States, with the Government of Guyana as the implementation agency and the CRFM Secretariat the executing agency in collaboration with Cuban experts.

CC4FISH: This project is not yet approved. The full Project Document was to be submitted to the Global Environment Facility in mid-2015, for this 4-year project. The Project aims to build understanding and awareness-building of climate change and vulnerability; to build fisherfolk, aquaculturists and coastal community resilience to climate change and vulnerability; and to mainstream climate change adaptation into multi-level fisheries governance. The Project is being executed by the Western Central Atlantic Fishery Commission with other regional partners (CRFM, CNFO, UWI, TNC and CARIBSAVE Partnership) and the governments of the seven participating countries (Antigua and Barbuda, St Kitts and Nevis, Dominica, Saint Lucia, St Vincent and the Grenadines, Grenada and Trinidad and Tobago).

In addition to the regional projects, achievement of the research activities could also be facilitated through implementation of the CRFM-OSPESCA Joint Action Plan as well as several joint regional working groups established under the WECAFC to address the spiny lobster, queen conch, flyingfish, shrimp and groundfish, sharks, spawning aggregations, recreational fisheries, deep-sea fisheries, FAD fisheries and IUU fishing.

5.0 CONSTRAINTS AND RECOMMENDATIONS FOR UPDATE AND REFINEMENT OF THE RESEARCH AGENDA

Updating the Research Agenda is a necessary and critical component to preserving the relevance of the document – to ensure that new developments, changing circumstances or emerging issues are considered. Such updates also allow for expanding the range of academic and research institutions and donor agencies

invited to provide feedback on areas of interest upon which future formal collaborative arrangements can be established to facilitate implementation of high-priority research activities. Below is a list of specific constraints experienced in developing this version of the Research Agenda, with recommendations to inform update and refinement of the document.

Inputs of CRFM Member States: Although the process and timelines for development and finalization of the Research Agenda were approved by the Executive Committee (CRFM, 2015) and endorsed by the Caribbean Fisheries Forum (CRFM 2015a) at the regional level, similar support at the national level was not evident based on the feedback received from Member States. This suggests that Member States did not fully appreciate the importance of their role in the development of the Regional Fisheries and Aquaculture Research Agenda that would be used to guide future efforts of the: (a) CRFM's Working Groups in high-priority areas of research to inform decision-making; (b) CRFM's Resource Mobilization Committee in sourcing funds for specific, high-priority research activities in the region; and (c) Secretariat in establishing formal collaborative arrangements with specific academic, research and other related organizations. The level of responses received (seven of 17 Member States with only 3 prioritizing the full list of 182 research recommendations) is also not consistent with the stated importance of research to inform management decision-making articulated at regional and international fora. There was also no feedback from national academic institutions based in Belize, Guyana, Suriname and Trinidad and Tobago. In light of the poor feedback, there is need to re-examine the process for development and finalization of the Research Agenda as well as the periodicity of updates. Consideration should be given to the respective established procedures within the Mechanism and the time required for Member States to provide their inputs against the time required for planning, resource mobilization, development and implementation of the CRFM Biennial Work Plans with which the Research Agenda should be linked. Although the initial initiative for development of the Research Agenda was taken by the Secretariat in keeping with the requirements of the CRFM's Strategic Plan, agreement of the Executive Committee or any other delegated sub-group of the Forum to champion this initiative would significantly increase the likelihood of success in developing a Research Agenda that meets with the approval and support of all Member States.

Methodology for Identifying High-Priority Research Recommendations to be included in the Research Agenda

The methodology used for identifying high-priority research activities for implementation at the regional level was simple – it entailed estimating a weighted average priority level for each of the 182 research recommendations based on the responses of CRFM Member States, ranking these weighted priority levels and identifying those high-priority activities for inclusion in the Research Agenda. There may be issues of importance to specific Member States which, through this procedure, do not emerge as being of regional importance. This is because there is tremendous diversity in the species and fisheries exploited by the 17 CRFM Member States associated with reef and slope, pelagic and continental shelf ecosystems. This does not preclude the sourcing of the requisite technical and financial assistance for the respective Member States but, if faced with limited resources, greater priority should be placed on those activities which benefit an appreciable number of Member States and for which there is general regional support. Depending on the outcome of the procedure it may be necessary to re-think the approach towards identifying high-priority research activities and to establish specific criteria to better characterize our understanding of 'regional' in the context of research.

General, repeated and overlapping research recommendations: In order to remain faithful to the original intention of the respective documents the research recommendations were listed using the original wording, to the extent possible. As a consequence, the list of recommendations was extensive, with some recommendations repeated in various contexts, some overlapping with others while some lacked specificity. These characteristics may have made the review exercise cumbersome for Member States,

academic and research institutions and donor agencies from which feedback was sought. While the list accurately reflects those research recommendations agreed upon by the CRFM Member States over a number of years there is need to address the generality, repetition and overlapping nature of these recommendations to arrive at a list that is specific enough for review, prioritization and ease of implementation. The role of the Forum in providing the necessary guidance is critical in this regard, since the Research Agenda is intended to address matters of regional importance as informed by national level priorities.

Misunderstanding of the purpose of the requested review and feedback: The responses of some academic and research institutions as well as donor agencies suggest some degree of misinterpretation of the purpose of the requested review and feedback on the list of research recommendations. A few institutions were hesitant to respond because of lack of funding to support collaboration in research. In some instances the language-barrier may have posed a problem for institutions in non-English speaking countries. Future engagement of such academic, research institutions and donor agencies to update and refine the Research Agenda should make clear that their responses confer no obligation to fund the respective research but simply serves as an indication of where the CRFM may source funds for implementation of the Research Agenda through already established formal procedures. It may also be necessary to send correspondences in the native-language of the respective institutions and agencies.

Keeping current: The following documents should be included among the list of documents reviewed in the next version of the Research Agenda: the 2015 St George's Declaration on the Caribbean Spiny Lobster; the Sub-regional Fisheries Management Plan for Blackfin Tuna fisheries (if endorsed by the Ministerial Council), the Sub-regional Fisheries Management Plan for FAD Fisheries (if endorsed by the Ministerial Council). As well, research recommendations arising from meetings and deliberations of the CRFM's Working Groups in 2015 and following, should be incorporated in future versions of the Research Agenda. Due to the expected approval of Associate Member status in 2016, Curaçao should be invited to review the Research Agenda, provide its inputs and prioritize the respective research recommendations.

Qualitative and quantitative responses: In an effort to limit the responses of academic, research and related institutions as well as donor agencies, no provisions were made for the inclusion of comments in providing their feedback on the Research Agenda. As a consequence some agencies arbitrarily included comments in other empty cells or provided detailed explanations in their response emails which made it difficult and time-consuming to collate all the comments. A combination of quantitative (prioritized numerically) and qualitative (explanatory notes in the absence of prioritization) responses on the list of research recommendations also posed a challenge for analysis. Hence the next version of the Research Agenda should provide adequate space for comments of the respective institutions and agencies and specifically indicate that all responses should be provided in the spreadsheet.

Linkages and synergies with Research Agenda of other sectors: Except for the Caribbean Health Research Agenda, this version of the CRFM Fisheries and Aquaculture Research Agenda does not consider existing regional Research Agenda for other sectors which may be linked to fisheries and aquaculture (e.g., the OECS Marine Research Strategy, the Eastern Caribbean Regional Ocean Policy). Regional partners under the Caribbean Community framework should be encouraged to provide the respective feedback.

Other relevant academic and research institutions: During the course of development of this version of the Research Agenda the following institutions were identified as possible collaborators however, due to time constraints these institutions were not invited to review the agenda and indicate areas of interest: Australian Research Council, Centre of Excellence for Coral Reef Studies; International Research

Institute for Climate and Society; the Gulf and Caribbean Fisheries Institute. Inputs of these institutions should be invited for the next version of the Research Agenda.

Limited feedback of donor agencies: Some donor agencies did not recognize or consider the applicability of the Research Agenda in the management of fisheries and aquaculture and the linkages with their own policies and programmes. One agency in particular which has voiced concern regarding illegal, unreported and unregulated fishing openly and is providing some support in this area in the region overlooked the related recommendations in the Research Agenda. A different approach is required in future to engage donor agencies. Due to the time and effort required for meaningful engagement, requiring research into the policies and programmes of such agencies as well as the mechanisms for requesting such funding, and development of strong research project proposals, it is recommended that the CRFM prioritizes its Research Agenda and assigns a timeline to high priority items for focused efforts of the Resource Mobilization Committee. It is also recommended that the CRFM engages the services of an expert to write the respective research proposals tailored to the requirements of the respective donor agencies, with technical support from the CRFM.

6.0 REFERENCES

- CRFM, 2013. CRFM Strategic Plan (2013 – 2021) [provisional]. CRFM Administrative Report. 35 pp.
- CRFM 2015. Report and Proceedings of the Twenty-fourth Meeting of the Executive Committee of the Caribbean Fisheries Forum. Kingstown, St. Vincent and the Grenadines, 19 – 20 February, 2015. Volume 1 – Supplement 2. *CRFM Management Report* – PY 2014 / 15. 73 pp.
- CRFM 2015a. Draft Report and Proceedings of the Thirteenth Meeting of the Caribbean Fisheries Forum, St. George's, Grenada, 30 – 31 March 2015. Volume 1. CRFM Management Report – PY 2015 / 16. 136 pp.
- CRFM 2015b. Report and Proceedings of the First Special Meeting of the Executive Committee of the Caribbean Fisheries Forum, 14 September 2015. Volume 1 – Supplement 1. CRFM Management Report – PY 2015 / 16. 16 pp.
- CRFM. 2015c. The CRFM's Fisheries and Aquaculture Research Agenda (Provisional). *CRFM Special Publication*, No. 5. 51 pp.

APPENDIX 1: LIST OF REFERENCE DOCUMENTS USED TO DEVELOP THE CRFM FISHERIES AND AQUACULTURE RESEARCH AGENDA

Shortened Reference	Full Citation
Coral Reef PoA	Australia Caribbean Coral Reef Collaboration 2014. Improving the outlook for Caribbean coral reefs: A Regional Plan of Action 2014-2019, Great Barrier Reef Marine Park Authority, Townsville.
Regional IAS Strategy & Action Plan	CABI. 2011. Strategy and Action Plan for Invasive Alien Species in the Caribbean Region 2011-2016. CABI, Curepe, Trinidad and Tobago. [An output of the Project: Mitigating the Threats of Invasive Alien Species in the Insular Caribbean (MTIASCIC) and collaborating countries, institutions, not for profit organizations and citizens of the wider Caribbean.
CCCFP	Caribbean Community Common Fisheries Policy
Food and Nutrition Security Policy	CARICOM Secretariat. 2011. Caribbean Regional Food and Nutrition Security Policy. CARICOM Secretariat, Turkeyen, Greater Georgetown, Guyana. 63 p.
IUU Fishing Declaration	Castries (St Lucia) Declaration on Illegal, Unreported and Unregulated Fishing - July 2010
CLME+ SAP	CLME Project. 2013. Strategic Action Programme (SAP) for the Sustainable Management of the Shared Living Marine Resources of the Caribbean and North Brazil Shelf Large Marine Ecosystem. GEF/UNDP. 99p.
9th ASM	CRFM 2013. Report of Ninth Annual CRFM Scientific Meeting - Kingstown, St. Vincent and the Grenadines, 10-14 June 2013. CRFM Fishery Report - 2013. Volume 1. 85p.
10th ASM	CRFM 2014. Report of Tenth Annual CRFM Scientific Meeting - Kingstown, St. Vincent and the Grenadines, 10-17 June 2013. CRFM Fishery Report - 2014. Volume 1. 179 p.
Blue Growth	CRFM 2014. Report of the CRFM / CNFO / CTA Regional Fisheries Workshop: Investing in Blue Growth, St. George's, Grenada on 20 - 21 November 2014
2nd Joint FF WG Mtg.	CRFM 2014. Report of the Second Joint Meeting of the CRFM Small Coastal Pelagic Fish Resource Working Group (SCPWG) and the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean. CRFM Fishery Report - 2013. Volume 1, Suppl. 3. 4p.
CRFM News	CRFM Newsletter - Scientific Issue - August 2014
CCA and DRM Assessment	CRFM, 2013. McConney, P., J. Charlery, M. Pena. Climate Change Adaptation and Disaster Risk Management in Fisheries and Aquaculture in the Caribbean Region. Volume 1 - Assessment Report. CRFM Technical & Advisory Document, No. 2013/8. 93p.
CCA And DRM Strategy	CRFM, 2013. McConney, P., J. Charlery, M. Pena. Climate Change Adaptation and Disaster Risk Management in Fisheries and Aquaculture in the Caribbean Region. Volume 2 - Regional Strategy and Action Plan. CRFM Technical & Advisory Document, No. 2013/8. 29p.
CCA And DRM Projects	CRFM, 2013. McConney, P., J. Charlery, M. Pena. Climate Change Adaptation and Disaster Risk Management in Fisheries and Aquaculture in the Caribbean Region. Volume 3 - Programme Proposals. CRFM Technical & Advisory Document, No. 2013/8. 20p.
MCS Strategy	CRFM, 2013. Regional Strategy on Monitoring, Control and Surveillance to Combat Illegal, Unreported and Unregulated Fishing in the CARICOM/CARIFORUM Region. CRFM Technical & Advisory Document, No. 2013 / 11. 79 p.
FAD Fishery Management	CRFM, 2013. Report of the CRFM-JICA CARIFICO/WECAFC - IFREMER MAGDELESA Workshop on FAD Fishery Management, 09 - 11 December 2013, St Vincent and the Grenadines. CRFM Technical & Advisory Document, No. 2013/9. 42p. (Appendix 11 - Conclusions)
Queen Conch fishery management*	CRFM, 2013. Support to improve and harmonize the scientific approaches required to inform sustainable management of Queen Conch (<i>Strombus gigas</i>) by CARIFORUM

Shortened Reference	Full Citation
	<p>States: Regional Review of the Queen Conch. CRFM Technical and Advisory Document. No. 2013/11</p> <p>CRFM, 2013. Regional Review of the Queen Conch. <i>CRFM Technical & Advisory Document, No. 2013/11. 167p.</i></p> <p>CRFM, 2013. Regional validation workshop on scientific approaches required to inform sustainable management of Queen Conch. <i>CRFM Technical & Advisory Document, No. 2013 / 12. 9 p.</i></p> <p>CRFM, 2013. Regional Management Options for Queen Conch with improved scientific approaches considered. <i>CRFM Technical & Advisory Document, No. 2013 / 13. 24 p.</i></p>
CRFM/CARICOM/Japan Friendship Year *	<p>CRFM, 2014. Draft Report of the CRFM/CARICOM/Japan Friendship Year: Regional Fisheries Workshop, 04-05 December 2014, Trinidad and Tobago. <i>CRFM Technical & Advisory Document, No. 2014/6. 65p.</i></p> <p>CRFM, 2014. Report of Fisheries Seminar Series for Japan-CARICOM Friendship Year. <i>CRFM Technical & Advisory Document No. 2014 / 6. 59p.</i></p> <p>CRFM, 2014. Report of the CRFM/CARIFICO FAD Management Workshop. <i>CRFM Technical & Advisory Document No. 2014/ 7. 17p.</i></p>
Statistics and Information Wksp.	CRFM, 2014. Report of Workshop to Develop a Strategy to Strengthen Capacity in CRFM States in the Area of Fisheries Statistics and Information, 10-12 February 2014, St Vincent and the Grenadines. CRFM Technical & Advisory Document, No. 2014/1. 135p.
Aquaculture PoA	CRFM, 2014. Study on the Potential of Fish Farming in the Caribbean. CRFM Technical & Advisory Document No. 2014/2. 78p.
Flyingfish FMP	CRFM, 2014. Sub-Regional Fisheries Management Plan for Flyingfish in the Eastern Caribbean. CRFM Special Publication No. 2. 42p. + annexes.
1st ASM	CRFM. 2005. Report of the First Annual CRFM Scientific Meeting. CRFM Fishery Report No. 11. 318 p.
2nd ASM	CRFM. 2006. Report of Second Annual Scientific Meeting - Port of Spain, Trinidad and Tobago, 13-22 March 2006. CRFM Fishery Report - 2006, Volume 1. 188 p.
3rd ASM	CRFM. 2007. Report of the Third Annual Scientific Meeting - St Vincent and the Grenadines, 17-26 July 2007. CRFM Fishery Report - 2007, Volume 1. 183 p.
4th ASM	CRFM. 2008. Report of the Fourth Annual Scientific Meeting - Kingstown, St Vincent and the Grenadines, 10-20 June 2008. CRFM Fishery Report - 2008. Volume 1. 219 p.
5th ASM	CRFM. 2009. Report of the Fifth Annual Scientific Meeting - Kingstown, St Vincent and the Grenadines, 09-18 June 2009. CRFM Fishery Report - 2009. Volume 1. 180p.
6th ASM	CRFM. 2010. Report of the Sixth Annual Scientific Meeting - Kingstown, St Vincent and the Grenadines, 07-16 June. CRFM Fishery Report - 2010. Volume 1. 109 p.
7th ASM	CRFM. 2011. Report of the Seventh Annual Scientific Meeting - Kingstown, St Vincent and the Grenadines, 16-24 June 2011. CRFM Fishery Report - 2011. Volume 1. 181 p.
Diagnostic study on poverty levels	CRFM. 2012. Diagnostic Study to Determine Poverty Levels in CARICOM Fishing Communities - Policy Document. CRFM Technical & Advisory Document, Number 2012/3, Volume II. 25p. (Policy Document)
CRFM Management Report - PY 2013-14	CRFM. 2013. Report and Proceedings of the Seventh Meeting of the Ministerial Council of the Caribbean Regional Fisheries Mechanism, Accra Beach Hotel and Spa, Christ Church, Barbados, 31 May 2013. Volume 2. CRFM Management Report - PY 2013/14. 86 p.

Shortened Reference	Full Citation
Queen Conch field surveys*	<p>CRFM. 2013. Report of Workshop to deliver training in the conduct of queen conch field surveys. CRFM Technical and Advisory Document, No. 2013/16.</p> <p>CRFM, 2013. Underwater Fisheries Independent Approaches for Queen Conch Population Estimation –A Review. CRFM Technical & Advisory Document, No. 2013 / 14. 19p.</p> <p>CRFM, 2013. Series of Technical Documents generated during the Queen Conch Survey Training Workshop: Document I – Report of Mock Survey & Document II - Proposals for Country-specific Queen Conch Survey Plans. CRFM Technical & Advisory Document, No. 2013 / 16. 58p.</p>
CRFM-OSPESCA Joint Action Plan	CRFM-OSPESCA Joint Action Plan - September 2012
Lionfish Strategy	Gomez Lozano, R., L. Anderson, J.L. Akins, D.S.A. Budd. Garcia-Moliner, F. Gourdin, M. Laurent, C. Lilyestrom, J.A. Morris, Jr., N. Ramnanan and R. Torres. 2013. Regional Strategy for the Control of Invasive Lionfish in the Wider Caribbean. International Coral Reef Initiative, 31 pp.
Spiny Lobster monitoring	Headley, M. and Seijo, J.C., 2015. A review of the methodologies used for monitoring and evaluation of the spiny lobster stocks in the WECAFC countries and the development of a common methodology. FAO Publication - in prep.
JICA Master Plan Study	JICA IC Net Limited. 2012. Study on the Formulation of a Master Plan on the Sustainable Use of Fisheries Resources for Coastal Community Development in the Caribbean - Final Report. JICA, Japan. 153 pp + Appendices
EC recreational fisheries	Mohammed, E. 2012. Recreational Fisheries of the Eastern Caribbean. CRFM Research Paper Collection. Volume 7: 27-92.
*The first publication listed is the document reviewed during the initial stages of development of the Research Agenda. Since then however, the document has been restructured and published in separate components. The italicized references below reflect the new publications which contain the research recommendations that have been incorporated into the Research Agenda.	

APPENDIX 2: LIST OF STRATEGIC OBJECTIVES - CRFM STRATEGIC PLAN - 2013 - 2021
(Source: CRFM, 2013)

Strategic Objectives	Organizational Results
Strategic Objective A: Information on status and trends in the fisheries and aquaculture sector	<p>A1 – Countries and the CRFM Secretariat have strengthened capacities to collect, manage, analyze and use data and information for decision making, planning, policy formulation and implementation.</p> <p>A2 - Appropriate (regional) standards for data and information sharing are adopted by the Countries, supported by a protocol for data and information sharing</p> <p>A3 - A regional database on fisheries and aquaculture statistics and information from the CRFM members is established and maintained at the Secretariat offices.</p> <p>A4 – A CRFM Statistics and Information report is published annually.</p>
Strategic Objective B: Research & Development	<p>B1 - The social and economic performance of fisheries and aquaculture is evaluated and enhanced through appropriate measures (such as fuel saving technologies).</p> <p>B2 – A regional (collaborative) fisheries and aquaculture Research Agenda is effectively implemented through annual scientific meetings, joint species specific Working Groups, and targeted research projects and collaboration with national, regional and international academic and research institutions.</p> <p>B3 – The status of the ten most important commercially targeted fisheries stocks in the CRFM region is known, management performance relative to agreed targets is determined’ , as well as the need for conservation and potential scope for increase in production.</p> <p>B4 - The effectiveness of management and conservation measures is monitored and evaluated in line with internationally accepted indicators, and results are made publicly available.</p> <p>B5 – Best-practices fisheries technologies and gears are introduced by CRFM members, accompanied by technology transfer compliant with international standards.</p>
Strategic Objective C: Sustainable management of fisheries resources	<p>C1 – Policies, institutional arrangements and standards that facilitate the implementation of the CCCFP and the CCRF and other regional/international fisheries instruments have improved.</p> <p>C2 – The Precautionary approach (PA), Ecosystem Approach to Fisheries (EAF) and the Castries Declaration on Illegal, Unreported and Unregulated Fishing are actively implemented by the CRFM.</p> <p>C3 – Fisheries legal frameworks in the CRFM member countries, in support of sustainable utilization of the fisheries resources, are updated and harmonized where possible.</p> <p>C4 - Fisheries management and development plans and other fishery-specific conservation, management and recovery plans are prepared, adopted and implemented at national level and regional level where appropriate</p> <p>C5 – The state of fisheries resources and aquatic ecosystems in general in the CRFM mandate area is improved through effecting change to more sustainable fisheries practices.</p> <p>C6 - Fisheries operations by all CRFM members are made more transparent, efficient, safer and compliant with rules at all levels through established and functioning Monitoring, Control and Surveillance (MCS) systems, including a regional vessel monitoring system (VMS).</p>
Strategic Objective D: Sustainable use of fisheries resources	<p>D1 Small-scale fisherfolk organizations in CRFM member countries play an active role in planning, managing and monitoring fisheries.</p> <p>D2- Post-harvest losses are reduced and fish and fisheries products quality and safety are improved in the CRFM member countries.</p>

Strategic Objectives	Organizational Results
	<p>D3–The infrastructure for marketing and trade of fish and fisheries products in the CRFM member countries is improved and meets domestic needs and international standards where required.</p> <p>D4 The role of women in all levels of the fish value chain has been strengthened.</p>
Strategic objective E: Sustainable development of aquaculture	<p>E1 – Policy, institutional and legal frameworks enabling responsible aquaculture development have been established in the CRFM member countries.</p> <p>E2 – Most CRFM members have increased production of fish and fish products through improved aquaculture planning, sustainable expansion, diversification of species and intensification of aquaculture production systems.</p> <p>E3 – Voluntary guidelines, best management practices and standards for sustainable aquaculture in the Caribbean developed and adopted by the stakeholders.</p>
Strategic Objective F: Adaptation to climate change and disaster risk management in fisheries	<p>F1- CRFM members have incorporated the “CARICOM strategy and action plan on climate change adaptation and disaster risk management in fisheries and aquaculture” in their national programmes and plans and are effectively implementing at national level.</p> <p>F2 – Fisherfolk and fishing communities’ vulnerability to crisis, threats and emergencies is reduced through better preparedness and integration of disaster risk management approaches (planning and decision-making).</p> <p>F3 - Partnerships with CDEMA, CCCCC, FAO and others are strengthened to effectively address climate change adaptation issues in fisheries and aquaculture and enable the CRFM to play a more active role and coordinating role in this subject.</p> <p>F4 –The establishment of fisheries and aquaculture insurance schemes is promoted and technically supported by CRFM.</p>
Strategic Objective G: Capacity building and institutional strengthening	<p>G1 - Fisheries governance is benefiting from strengthened national fisheries administrations and other supporting institutional frameworks.</p> <p>G2 – Fisherfolk organizations and their representatives are competent and capable to collaborate and participate actively in fisheries management and conservation processes at local, national and regional level.</p> <p>G3 – Dedicated fisheries skills development programmes designed and implemented at national and regional level through strengthened fisheries extension services.</p> <p>G4 – CRFM member countries and stakeholders have access to formal fisheries and aquaculture education programmes designed and implemented at CARICOM level.</p> <p>G5 – Small and Medium Enterprises (SMEs) active in the fisheries sector in the CRFM member states have business plans and access to micro-finance, credit and investment facilities</p>
Functional Objective H: Effective collaboration with member states and stakeholders	<p>H1 – Effective programme and project development that addresses CRFM members needs and priorities, accompanied by efficient resource mobilization, monitoring, implementation and reporting mechanisms.</p> <p>H2 – The process of provision of fisheries management advice is streamlined within the CRFM structure.</p> <p>H3 –The CRFM Communication Strategy is effectively implemented, addressing communication and information needs of CRFM members, Secretariat and other stakeholders.</p> <p>H4 – The joint CRFM-OSPESCA Action Plan and other key partnerships and alliances that contribute to and complement the CRFM work are implemented effectively.</p> <p>H5 – The Caribbean Large Marine Ecosystem (CLME+) Strategic Action Programme (SAP) is implemented actively by the CRFM.</p>

Strategic Objectives	Organizational Results
	<p>H6 – The presence of CRFM at ICCAT sessions and in ICCAT decision making processes has significantly increased.</p> <p>H7 – Effective direction of CRFM by the Ministerial Council and Fisheries Forum through improved governance, conflict resolution capacity and oversight.</p> <p>H8 – Enhanced representation of CRFM countries in regional/international fora (ICCAT, UNCLOS, COFI) and events through its members or the Secretariat.</p> <p>H9 - CRFM's status and role within the region as an effective RFB, and its capacity for project management and coordination is strengthened and consolidated</p>
Functional Objective I: Efficient and Effective administration	<p>I1 – CRFM Member States are paying their annual contributions to CRFM in a timely manner, encouraged by the achievements, successes and benefits of CRFM membership and by the sanctions in the CRFM Agreement for non-payment of the contributions.</p> <p>I2 – Improved capacity in and resources available to the CRFM Secretariat to programme, plan and implement its activities in an effective and efficient manner.</p> <p>I3 – CRFM is recognized as provider of accurate and relevant administrative, financial and management information to its members.</p> <p>I4 – Strengthened capacity of the CRFM Secretariat to assume the additional responsibilities that accompany the role of CRFM as Competent Agency to support implementation of the CCCFP.</p> <p>I5 – Efficiency savings and gains identified, agreed and implemented.</p>

APPENDIX 3. LIST OF RESEARCH RECOMMENDATIONS DERIVED FROM AGREED REGIONAL POLICIES, STRATEGIES AND ACTION PLANS AS WELL AS OTHER CRFM REPORTS

SO/OR = Strategic Objective #/Organizational Result # (Note SO B2 applicable to all – See Appendix 2 for details); **Source (Shortened Reference)** – See details in Appendix 1.

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
1	E2	Aquaculture	Aquaculture	Determine commercial viability of species identified for aquaculture production	Blue Growth
2	E2	Aquaculture	Aquaculture	Market feasibility studies for indigenous and locally produced species	Aquaculture PoA
3	E2	Aquaculture	Aquaculture	Market and technical feasibility assessments of ornamental fish culture	Aquaculture PoA
4	E2	Aquaculture	Aquaculture	National GIS-based surveys of biophysical, infrastructural and institutional factors to assess aquaculture potentials of country or region within country	Aquaculture PoA; Diagnostic study on poverty levels
5	E2	Aquaculture	Aquaculture	Institutional research on the potential of low trophic level species for aquaculture (sea urchin, sea cucumber, blue land crab)	Aquaculture PoA
6	E2	Aquaculture	Aquaculture	Further research on native species (preferred) and their feasibility for aquaculture in promoting sustainable practices at the regional level	CRFM-OSPESCA Joint Action Plan
7	E2	Aquaculture	Aquaculture	Explore/diversification including integrated multi-trophic aquaculture and aquaponics	Blue Growth
8	E2	Aquaculture	Aquaculture	Institutional research on reproductive biology on 2-3 indigenous and local species	Aquaculture PoA
9	E2	Aquaculture	Aquaculture	Preliminary scoping study and pilot project in 2 countries on renewable energy development in aquaculture	Aquaculture PoA
10	E2	Aquaculture	Aquaculture	Industry research on local feed material substitution in small-scale fish farming	Aquaculture PoA
11	E2	Aquaculture	Aquaculture	Support the development and/or obtaining of cost effective sources of feed for aquaculture	CRFM/CARICOM/ Japan Friendship Year

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
12	E2	Aquaculture	Aquaculture	Support aquaculture activities in general and, in particular, marine aquaculture such as, but not limited to, grouper farming, mangrove oyster farming and culture of selected ornamental species	CRFM/CARICOM/ Japan Friendship Year
13	E2	Aquaculture	Aquaculture	Seed production, production technologies, environmental measures, markets and health measures associated with aquaculture to be given due attention in research and development	CRFM-OSPESCA Joint Action Plan
14	B3	Blackfin tuna	Pelagic species, fisheries and ecosystems	Conduct study on the impact of FAD on the blackfin tuna fishery.	8th ASM
15	B3	Blackfin tuna	Pelagic species, fisheries and ecosystems	Collect and analyse length frequency data to assist in definition of any migration patterns that may exist.	8th ASM
16	B3	Blackfin tuna	Pelagic species, fisheries and ecosystems	Regional studies on reproduction and genetics with respect to blackfin tuna [note recommendation of 8th ASM to participate in proposed genetic studies of IFREMER to help define stock structure]	7th ASM; 8th ASM
17	B3	Blackfin tuna	Pelagic species, fisheries and ecosystems	Determine growth, maturity and spawning aggregations of blackfin tuna	9th ASM
18	F1; F2	Climate change	Climate change & natural hazards	[Studies in support of]Develop[ing] post-harvest processing and marketing capacity to use unfamiliar, altered season or more abundant species [research aspects]	CCA and DRM Assessment and Projects
19	F1;	Climate change	Climate change & natural hazards	Research on coral nursery to identify species that are adaptive to warming sea temperatures and other parameters in selected countries	CCA and DRM Strategy

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
20	F1; F2; B1	Climate change	Climate change & natural hazards	Increase research, development and investment funding for green technology such as supplemental wind and solar power for fishing vessels and processing plants, and vessel designs or powering to reduce fossil fuel consumption	CCA and DRM Strategy
21	F1; F2; B1	Climate change	Climate change & natural hazards	Accelerate research into and development of biofuels and the use of more efficient and affordable outboard and inboard engines in fishing vessels	CCA and DRM Strategy
22	F1; F2	Climate change	Climate change & natural hazards	(A) Identify, and where possible develop, alternative livelihood opportunities for fisherfolk and other vulnerable groups in the coastal zone; (B) Collaboration with a range of other sector agencies to implement systematic approaches to livelihood diversification for poor fishing and aquaculture communities in ways that build their resilience and reduce their vulnerability	CCA and DRM Strategy (A); CRFM-OSPESCA Joint Action Plan (B)
23	F1; F2	Climate change	Climate change & natural hazards	Develop methodologies and systems for culture of indigenous marine and brackish water and fresh water species to diversify industry, reduce pressures on living marine resources and build coastal community resilience	CCA and DRM Strategy
24	F1; F3	Climate change	Climate change & natural hazards	Undertake risk assessment and risk mapping of natural disasters within the fisheries and aquaculture sectors	CRFM-OSPESCA Joint Action Plan
25	F1; F3	Climate change	Climate change & natural hazards	Assess the vulnerability and risks associated with changing climate;	CCA and DRM Strategy
26	F1; F2	Climate change	Climate change & natural hazards	Vulnerability and capacity assessment of the impacts of climate change on water, agriculture, [tourism], coastal and marine and [forestry sectors] for the years 2020 and 2050 in all CARICOM states	CCA and DRM Strategy
27	B1; B5; F1	Climate change	Climate change & natural hazards	[Research in support of helping to] Improve energy efficiency on all fishing vessels, in fish processing plants and on fish farms within green economy [research aspects]	CCA and DRM Assessment

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28	F1; F2; F3	Climate change	Climate change & natural hazards	Develop and/or implement new research and teaching areas in alternative energy, waste management, resource economics and GIS remote sensing	CCA and DRM Strategy
29	F1	Climate change	Climate change & natural hazards	Conduct research on linkages between climate and health, with emphasis on diseases and impacts	CCA and DRM Strategy
30	F1; F3	Climate change	Climate change & natural hazards	Research development of models to forecast changes in distribution, abundance and production of commercially important fisheries and the social and economic impacts based on different climate scenarios to facilitate planning, decision-making and disaster risk management.	CCA and DRM Strategy
31	F1	Climate change	Climate change & natural hazards	Necessary to advance research in climate change and new invasive species [response based on observation of new seagrass species in Dominica]	CRFM/CARICOM/ Japan Friendship Year
32	B3; C2; F1;F 3	Climate change	Climate change & natural hazards	Develop research to address current and future impacts of climate change and sea-level rise on the marine ecosystems (CLME SAP Action endorsed by RSWG)	9th ASM
33	F1; F2	Climate change	Climate change & natural hazards	Assess the socio-economic impacts of climate change on fisheries and aquaculture	CCA and DRM Strategy
34	F1; F2	Climate change	Climate change & natural hazards	Undertake gender analyses in fisheries and aquaculture to demonstrate usefulness in policy, planning and management	CCA and DRM Assessment and Projects
35	F1	Climate change	Climate change & natural hazards	Resource valuation studies to include ecosystem decisions on the alteration of coastal habitats	CCA and DRM Assessment

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36	F1	Climate change	Climate change & natural hazards	Economic valuation of fisheries and aquaculture resources in selected countries	CCA and DRM Strategy
37	F1	Climate change	Climate change & natural hazards	Add to the cases of economic valuation coastal forests such as mangrove for alternative uses including those related to fisheries and aquaculture; share lessons from valuation studies in order to guide policy	CCA and DRM Strategy
38	F1	Climate change	Climate change & natural hazards	Mapping and valuation of coastal ecosystems and habitats, including coral reefs, sea-grass beds, mangrove systems, to document location, state of health and contribution to economic development	CCA and DRM Strategy
39	F1; F2; F3	Coral reefs	Reef and slope species, fisheries and ecosystems	Identify climate change vulnerabilities and incorporate these into planning and management; Develop and implement vulnerability assessments	Coral Reef PoA
40	B1; F1	Coral reefs	Reef and slope species, fisheries and ecosystems	Valuation of resources and communicate results to policy makers, decision makers and stakeholders	Coral Reef PoA
41	C2; F1; F2	Coral reefs	Reef and slope species, fisheries and ecosystems	Identify tools and approaches for integrating social resilience and ecological resilience	Coral Reef PoA
42	F1;F 2	Coral reefs	Reef and slope species, fisheries and ecosystems	[Research to help]Understand countries' resource dependency and links to vulnerability	Coral Reef PoA

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43	B3	Deep slope fisheries	Reef and slope species, fisheries and ecosystems	Obtaining baseline information of the deep slope fishing to determine the potential for this type of fishery	CRFM/CARICOM/Japan Friendship Year
44	B3	Dolphinfish	Pelagic species, fisheries and ecosystems	Assess the implications of alternative stock structure hypotheses for dolphinfish in the WECAFC region.	6th ASM
45	B3	Dolphinfish fishery	Pelagic species, fisheries and ecosystems	Monitor trends in regional catches and catch rates to identify signs of stock decline and promote regional collaboration on appropriate management strategies to be implement - data to include catch and catch rates of US, Venezuela and French territories fisheries with focus on historical times series catch and effort data and respective "data-mining"	2nd ASM; 5th ASM; 6th ASM
46	B3; C2; F1;F3	EAF	Policy, Governance & management	Conduct research in order to determine the effects of environmental changes on fisheries and aquatic ecosystems	CCCFP
47	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Research on fishing capacity related to FADs and the anticipated impact of that capacity if it is realized	FAD Fishery Management
48	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADS for a better knowledge of the exploitation level of the fisheries resources and their dynamics	FAD Fishery Management
49	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of optimal FAD density and optimal time of use for a sustainable FAD fishery	FAD Fishery Management
50	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Monitor FAD impacts on the biology and ecology of the fish populations affected	CRFM/CARICOM/Japan Friendship Year

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51	C2; F2	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of environmental degradation and climate change and variability issues	FAD Fishery Management
52	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of interactions between FADs and species	FAD Fishery Management
53	B1	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of social and economic aspects of the FAD fisheries	FAD Fishery Management
54	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of relationship between FAD fishery and other fishing techniques on other resources and possible impact of these interactions	FAD Fishery Management
55	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of co-management experiments and their impact on the sustainable development of moored FAD fisheries	FAD Fishery Management
56	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of the social customs that help to characterize formal and informal FAD governance arrangements	FAD Fishery Management
57	B3; C2; C5	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of technologies and best management practices that can help reduce the take of small and juvenile fish at FADs	FAD Fishery Management
58	D2	FAD fisheries	Pelagic species, fisheries and ecosystems	Promote and encourage further research on FADs for a better knowledge of markets and product development and SPS issues	FAD Fishery Management

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59	B3	Fisheries analyses	Stock assessment and fisheries analyses	Detailed analysis of the development, status and importance of the fisheries as a whole	Statistics and Information Wksp.
60	B	Fisheries analyses	Stock assessment and fisheries analyses	Development potential of underutilised and unutilised resources	CRFM-OSPESCA Joint Action Plan
61	B	Fisheries analyses	Stock assessment and fisheries analyses	Collaboration with OSPESCA on regional research concerning species/fisheries of interest such a the spiny lobster, large pelagic fisheries, queen conch and lionfish - biology, ecology and management	CRFM-OSPESCA Joint Action Plan
62	B3; C2	Flyingfish	Pelagic species, fisheries and ecosystems	Impact assessment of sea and land-based human activities on habitats, life cycles and food webs of flyingfish and the productivity of related marine ecosystems	Flyingfish FMP; 9th ASM; 2nd Joint FF WG Mtg.
63	B3	Flyingfish	Pelagic species, fisheries and ecosystems	Develop research plan for synoptic survey [of flyingfish fisheries] to be conducted if 5000 t catch trigger point is exceeded	9th ASM & 2nd Joint FF WG Mtg.
64	B1; B3	Flyingfish fishery	Pelagic species, fisheries and ecosystems	(A) Bio-economic analysis of flyingfish fisheries in the context of EAF; (B) Future bio-economic research for the fishery should consider the following questions: (1) Are long-term stock fluctuations associated to changes in abundance of predators (i.e. dolphinfish, and other large pelagic species) and competitors targeted by other fleets? If so, is there a dynamic bioeconomic optimum level of effort and fishing capacity of the eco-technological interdependent fleets? (2) Are the cycle and/or amplitude of long-term fluctuating stocks changing with climate change? If so, what should the adequate vessel capacity be?	Flyingfish FMP (A); 7th ASM (B)
65	C2; C5	Flyingfish fishery	Pelagic species, fisheries and ecosystems	Assessment of the most appropriate vessel/ fishing capacity for achieving the stated management goals in light of long-term fluctuations in stock abundance and a changing environment	CRFM News

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66	A1; C1;	Flyingfish fishery	Pelagic species, fisheries and ecosystems	Risk analysis associated with climate change, extreme weather events and other aspects of global environmental change [on flyingfish and associated large pelagic fisheries and related ecosystems]	Flyingfish FMP; 9th ASM; 2nd Joint FF WG Mtg.
67	B1	Flyingfish fishery	Pelagic species, fisheries and ecosystems	Sub-regional cost and earnings study and comparison of the economic and financial performance of flyingfish fisheries and flyingfish value-addition	Flyingfish FMP
68	B3; B4; H5	Flyingfish fishery	Pelagic species, fisheries and ecosystems	Identification and refinement of operational objectives, indicators and reference points for monitoring and evaluation of performance of agreed management priorities	Flyingfish FMP
69	B1	Flyingfish fishery	Pelagic species, fisheries and ecosystems	Socio-economic study of flyingfish fishers and processors	Flyingfish FMP
70	A4; B3; B4	Food and Nutrition Security	Food and Nutrition Security	Baseline study to assess food and nutrition status [as pertaining to fisheries] in the region (and inter alia the impact of gender and age) and to identify and agree on objectively verifiable indicators of achievement	Food and Nutrition Security Policy
71	B3; C2	Invasive alien species	Invasive alien species	Support scientific research on invasive species such as lionfish and <i>Sargassum</i> to consider the current and long term impacts on the regional fisheries	CRFM/CARICOM/J apan Friendship Year
72	B3; C2	IUU fishing	IUU fishing	To establish a Working Group to be convened through the CRFM to regularly consult on methodologies and approaches that will harmonise and enhance the reliability of data collection in relation to IUU fishing [this will require the corresponding research support]	IUU Fishing Declaration
73	C2	IUU fishing	IUU fishing	The Ministerial Council -Agreed that higher priority be given to areas that needed to be addressed immediately, including queen conch, spiny lobster and combatting IUU activities in the Caribbean Region and Central American Region.	CRFM Management Report - PY 2013- 14
74	C2	IUU fishing	IUU fishing	The Ministerial Council - Recognized the need to find mechanisms to bridge the gap with French territories to deal with IUU fishing in the Eastern Caribbean.....[Identify mechanisms to bridge the gap with French territories	CRFM Management Report - PY 2013- 14

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				to deal with IUU fishing in the Eastern Caribbean as well as to deal with IUU fishing as a region]	
75	B3	Large pelagic fishery	Pelagic species, fisheries and ecosystems	Re-run regional ECOPATH model developed under the LAPE Project - change parameters to answer different management questions not considered by the LAPE project but of interest to the LPWG.	5th ASM
76	B1; C2	Large pelagic fishery	Pelagic species, fisheries and ecosystems	Determine socio-economic value of large pelagic fisheries in CRFM countries	9th ASM
77	B3	Large pelagics	Pelagic species, fisheries and ecosystems	Use results of the LAPE project to start developing ecosystem indicators for the pelagic ecosystem.	5th ASM
78	B3; C2;	Large pelagics	Pelagic species, fisheries and ecosystems	Conduct studies to assess the impact of <i>Sargassum</i> on pelagics, especially dolphinfish and wahoo	10th ASM
79	B3; C2; F1;F 3	Large pelagics	Pelagic species, fisheries and ecosystems	Determine impacts/effects of climate change on commercial large pelagic species	9th ASM
80	B3;	Large pelagics	Pelagic species, fisheries and ecosystems	Determine spatial distribution for commercial large pelagic species; [impacts of <i>Sargassum</i> and other environmental factors]	9th ASM
81	B3; C2	Lionfish	Invasive alien species	Encourage targeted socio-economic impact surveys related to lionfish invasion	Lionfish Strategy
82	B; D3	Lionfish	Invasive alien species	Assess and develop safe lionfish harvesting strategies for seafood markets	Lionfish Strategy
83	B	Lionfish	Invasive alien species	Record and assess existing technologies to control lionfish invasion and identify most successful ones	Lionfish Strategy
84	B3;	Lionfish	Invasive	Comprehensive overview of current understanding and knowledge of the	CRFM-OSPESCA

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	C2		alien species	biology and ecology of lionfish, of its impacts on the fishing industries of the Caribbean region and of best management control practices	Joint Action Plan
85	B; D2	Lionfish	Invasive alien species	Support studies on ciguatera and other potential food-borne illness that may be associated with lionfish	Lionfish Strategy
86	B3; C2	Lionfish	Invasive alien species	List and assess existing survey methods (including ecological impact studies and lionfish content analysis) - [Lionfish Strategy - RSWG assigned high priority to strategy 1 - Promote the adoption of existing standardized survey methods for lionfish and incorporate into relevant monitoring programs (fisheries, reefs, etc.)]	9th ASM
87	B	Lionfish	Invasive alien species	List and assess existing survey methods (including ecological impact studies) related to lionfish invasion	Lionfish Strategy
88	B	Lionfish	Invasive alien species	Develop new control technologies for lionfish (where relevant)	Lionfish Strategy
89	B4	Management	Policy, Governance & management	CRFM survey to monitor and assess Member State compliance with WECAFC recommendations [pertaining to Spawning Aggregations]	Blue Growth
90	D2; D3	Marketing and trade	Marketing and trade	Develop a marketing strategy to strengthen intra-regional trade - which includes evaluation of options for improving access to local-fishery and aquaculture-generated protein by the region's populations	CRFM-OSPESCA Joint Action Plan
91	B3; D3	Marketing and trade	Marketing and trade	Study on potential markets for underdeveloped fisheries	CRFM/CARICOM/J apan Friendship Year
92	C2; C3; C6	MCS	MCS	Regional study on bilateral/multi-lateral agreements among CARIFORUM States for fisheries protection and MCS activities	MCS Strategy
93	C2	MCS	MCS	Regional study on cost-benefit analysis of MCS strategic options	MCS Strategy
94	C2; C3	MCS	MCS	Regional study on harmonized and implementation of management measures for conch and lobster and their enforcement	MCS Strategy
95	C2; C3	MCS	MCS	Regional study to amend/update fisheries sector legislation, focusing on MCS content	MCS Strategy

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96	C2; C6	MCS	MCS	Regional study on improving public awareness and involvement in MCS	MCS Strategy
97	A2; B4	Monitoring and Evaluation	Monitoring and Evaluation	Conduct research in order to analyze the effectiveness of management and conservation measures	CCCFP
98	B3	Nassau grouper	Reef and slope species, fisheries and ecosystems	Regional assessment of Nassau Grouper stocks and trade [possibly also socio-economic assessment?]	Blue Growth
99	D1	Participatory approach	Policy, Governance & management	The Ministerial Council - Supported the efforts of the CNFO towards achieving a mechanism to move participation of fisherfolk in the decision making process from consultation to equitable decision making [identify mechanisms to move participation of fisherfolk in the decision-making process from consultation to equitable decision-making]	CRFM Management Report - PY 2013- 14
100	C1	Policy	Policy, Governance & management	Conduct research in order to contribute to the fulfillment of any objective under the CCCFP	CCCFP
101	B3; B4	Queen Conch	Reef and slope species, fisheries and ecosystems	Develop regional conversion factors for Queen Conch	Queen Conch fishery management
102	B3;	Queen Conch	Reef and slope species, fisheries and ecosystems	Develop better estimates of queen conch length-weight relationships for the Grenadines to better calibrate equations necessary to estimate TAC.	Queen Conch field surveys
103	B3;	Queen Conch	Reef and slope species, fisheries and ecosystems	Collection and analysis of plankton samples to monitor populations of Queen Conch	Queen Conch field surveys

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104	B1; C2	Queen Conch	Reef and slope species, fisheries and ecosystems	Socio-economic analysis of Queen Conch fisheries	Queen Conch fishery management
105	B3; B4; C2	Queen Conch	Reef and slope species, fisheries and ecosystems	Develop an "operating model" for Queen Conch to provide guidance on and test harvest strategies and stock assessments	Queen Conch fishery management
106	B3;	Queen Conch	Reef and slope species, fisheries and ecosystems	Quantify deep-water queen conch stocks	Queen Conch field surveys
107	B3;	Queen Conch	Reef and slope species, fisheries and ecosystems	Improve estimates of queen conch catches - including catches from IUU fishing	Queen Conch field surveys
108	B3	Queen Conch	Reef and slope species, fisheries and ecosystems	The Ministerial Council- called upon the CRFM Secretariat to collect and compile scientific data and information in relation to the queen conch species throughout the region, conduct the necessary studies so that the level of production and state of the stock is clearly understood	CRFM Management Report - PY 2013- 14
109	B3	Queen Conch	Reef and slope species, fisheries and ecosystems	GIS mapping of Queen Conch fishing grounds and associated marine areas and habitats - possibility to include data collection and analysis e.g. abundance surveys	Queen Conch fishery management

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110	C5	Recreational fisheries	Recreational fisheries	Specific research programmes which should be directed by policy are recommended on: (f) Identification of viable alternative target species for recreational fisheries in light of the likely declines in abundance and redistribution of the resources (large tunas and billfish) envisaged with climate change in future.	EC recreational fisheries
111	C5	Recreational fisheries	Recreational fisheries	Specific research programmes which should be directed by policy are recommended on: (b) Socio-economic characterization of the recreational fishery subsector – demographics of members of the fishing sector including information on their full-time employment; cost of fishing, income from sale of fish, income from charter boat fishing, cost of hosting fishing tournaments, economic returns from tournaments and valuation of fishing tournaments;	EC recreational fisheries
112	C5	Recreational fisheries	Recreational fisheries	Specific research programmes which should be directed by policy are recommended on: (e) Assessment of the physiological impacts of tag and release or catch and release, in particular post-release mortality of dolphinfish and wahoo, which are of regional importance.	EC recreational fisheries
113	C5	Recreational fisheries	Recreational fisheries	Specific research programmes which should be directed by policy are recommended on: (c) Assessment of the status of stocks targeted by recreational fisheries, including current population sizes and density;	EC recreational fisheries
114	C5	Recreational fisheries	Recreational fisheries	Specific research programmes which should be directed by policy are recommended on: (a) species biology - sizes of fish caught; state of maturity; size at maturity, spawning seasons, spawning areas, age and growth, distribution, migration and home ranges of species of regional importance (e.g. common dolphinfish, wahoo and king mackerel)	EC recreational fisheries
115	C5	Recreational fisheries	Recreational fisheries	Specific research programmes which should be directed by policy are recommended on: (d) Economic evaluation of the recreational fishing subsector – this analysis should include the social, environmental and cultural value of recreational fisheries, the economic evaluation of fishing tournaments and charterboat fishing and should investigate the extent to which the sale of fish covers fishing costs or supplements the income of persons who have categorized themselves as recreational fishers.	EC recreational fisheries

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116	B1	Resource valuation	Stock assessment and fisheries analyses	Valuation of the fisheries sector and related activities	Statistics and Information Wksp.
117	B3	Seabob	Continental shelf species, fisheries and ecosystems	A comparative study between the Suriname and Guyana seabob fishery and management regimes to allow the fishery management to adapt and improve [SGWG general recommendation]	9th ASM
118	B3	Shrimp	Continental shelf species, fisheries and ecosystems	Scientific research to be conducted for Penaeus species in collaboration with Guyana and French Guiana, stock assessment of main target species of artisanal fisheries [excerpt from Suriname report]	CRFM/CARICOM/J apan Friendship Year
119	B3	Shrimp fishery	Continental shelf species, fisheries and ecosystems	Use of hydrometric data as a recruitment/growth index should be considered as such factors as water levels and water flows may cause fluctuation in stock size and hence help to explain variation in CPUE.	7th ASM
120	B3	Shrimp fishery	Continental shelf species, fisheries and ecosystems	Develop a species-specific population model which would provide more detailed management advice. Activities would include developing software; improving growth parameter estimates and morphometric relationships, and developing time series of environmental variables, including levels of pollution.	2nd ASM
121	B3	Shrimp fishery	Continental shelf species, fisheries and ecosystems	Determine growth parameters from the Trinidad shrimp length frequency data using such software as Length Frequency Distribution Analysis (LFDA).	2nd ASM
122	B3	Shrimp fishery	Continental shelf species, fisheries and ecosystems	Refine morphometric relationships for input to population model.	2nd ASM

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123	B3	Shrimp fishery	Continental shelf species, fisheries and ecosystems	Improve the logistic model for the Trinidad and Tobago/Venezuela shrimp fishery as follows: (1) Consider changing catchability due to any shifts from targeting shrimp to targeting bycatch; (2) Include the CPUE standardization as part of the stock assessment rather than performing this outside the assessment and pulling in the results; and (3) estimate the shrimp CPUE for the historical years.	7th ASM
124	B3	Shrimp fishery	Continental shelf species, fisheries and ecosystems	Re-evaluate stock structure as the current assumed structure, effectively a single stock shared between Venezuela and Trinidad, may not be accurate enough to protect fleets from depleting the resource they have access to.	7th ASM
125	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Conduct research to improve understanding of the biology and ecology of these resources (if funds are available)	4th ASM
126	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Undertake a survey to quantify the social and economic importance of small coastal pelagic fisheries. Such a survey should be designed to provide information on the contribution of these fisheries to food security on local and national scales, employment, and the relationship of the supply of fresh fish with the consumption of other non-local sources of animal protein.	4th ASM
127	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Determine the extent to which these resources are shared by countries within the region	1st ASM
128	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Examine fish movement and migration patterns	1st ASM
129	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Examine vulnerability of scads and other small coastal pelagic fish resources to environmental conditions and likely impact on management approaches	1st ASM

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130	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Examine whether fish are more vulnerable to fishing gears when they are immature or when they are in spawning condition	1st ASM
131	B3	Small coastal pelagic fishery	Pelagic species, fisheries and ecosystems	Identify spawning periods to inform development of appropriate management strategy	1st ASM
132	B1; C1; C2; C3; C4; C5; C6	Small-scale fisheries	Small-scale fisheries	Evaluate status of implementation of the SSF guidelines in three main areas: socio-economics, governance , and ecology	Blue Growth
133	B3; C2	Small-scale fisheries	Small-scale fisheries	Develop scientific models appropriate to small-scale fisheries	Blue Growth
134	B1	Socio-economic performance	Stock assessment and fisheries analyses	Conduct research in order to evaluate the social and economic performance of fisheries and aquaculture	CCCFP
135	B3; C2; F1; F2; F3	Spiny lobster	Reef and slope species, fisheries and ecosystems	(A) Incorporate ecosystem and environmental information into spiny lobster stock assessments, such as predator/prey interactions and community structure, climatic shifts in ocean currents and temperature, ocean acidification and diseases caused by toxins and pathogens; (B) Additional information needs to be looked at as it relates to habitat [of spiny lobster]	Spiny lobster monitoring (A); Blue Growth (B)
136	B3; C2	Spiny lobster	Reef and slope species, fisheries and ecosystems	Develop morphometric conversion factors for spiny lobster	Blue Growth

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137	B3; C2	Spiny lobster	Reef and slope species, fisheries and ecosystems	Develop fishery-independent, consistent techniques that monitor distribution and abundance of lobster	Spiny lobster monitoring
138	B3; C2; C4	Spiny lobster	Reef and slope species, fisheries and ecosystems	Assess the status (annually) of the spiny lobster stock biomass in the Western Central Atlantic area, taking into account the source-sink configuration of larvae production and settlement, and recommend appropriate harvest control rules	Spiny lobster monitoring
139	B3	Stock assessment	Stock assessment and fisheries analyses	Support scientific research (stock assessment) of main target species of artisanal fisheries (including for <i>Penaeus</i> species in collaboration with Guyana and French Guiana).	CRFM/CARICOM/ Japan Friendship Year
140	B3	Stock Assessment	Stock assessment and fisheries analyses	Conduct research in order to ascertain the status of fish stocks	CCCFP
141	B3; C2; F1; F2	Under- or unutilised species	Under- or unutilised species	Conduct research in order to determine the development potential of underutilised and unutilised fisheries resources	CCCFP
142	B3	Wahoo fishery	Pelagic species, fisheries and ecosystems	Validate presumed annual growth rings to facilitate otolith-based ageing of wahoo aimed at providing information on the age structure of catches and refined estimates of growth parameters for future assessments (through support to the IMA)	1st ASM; 3rd ASM
143	B3	Wahoo fishery	Pelagic species, fisheries and ecosystems	Monitor trends in regional catches and catch rates to identify signs of stock decline and promote regional collaboration on appropriate management strategies to be implement - data to include catch and catch rates of US, Venezuela and Netherland Antilles fisheries with focus on historical times series catch and effort data	1st ASM; 3rd ASM

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144	B3	Wahoo fishery	Pelagic species, fisheries and ecosystems	Implement a tagging programme for wahoo to collect the range of information for the species that such studies can generate, such as migration patterns and ranges.	3rd ASM
145	C1; C2	Policy	Policy, Governance & management	Conduct regular reviews and analysis of policies (to assess their impacts on small-scale fisheries), and of policy processes (to assess the extent to which small-scale fisheries interests are being included)	Diagnostic study on poverty levels
146	C1	Marketing and trade	Marketing and trade	A market analysis would provide information on use of the resources and the marketing and new market opportunities	Diagnostic study on poverty levels
147	B3	Stock assessment	Stock assessment and fisheries analyses	Suitable resource management: If Caribbean countries are to manage their fisheries resources properly, they must improve their knowledge of the nature and exploitation level of those resources in order to implement and develop fishery management plans. This knowledge can be extended by fostering fishery research and regular information collection.	Diagnostic study on poverty levels
148	C2	IUU fishing	IUU fishing	Assessment and management of overcapacity and IUU: IUU (illegal, unreported and unregulated) fishing affect the sustainability and economic efficiency of small-scale fisheries, reducing or even jeopardizing their capacity to contribute to poverty alleviation.	Diagnostic study on poverty levels
149	B2; D4	Gender	Gender	Collect information on research done to date on gender in fisheries	Diagnostic study on poverty levels
150	B2	Gender	Gender	Promote research on gender issues in fisheries	Diagnostic study on poverty levels
151	B2	Gender	Gender	Develop indicators that are specific to achievement of gender equity and the empowerment of women in fisheries	Diagnostic study on poverty levels
152	F	Natural hazards	Climate change & natural hazards	Standardizing and harmonizing risk management methodologies and practices	Diagnostic study on poverty levels

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
153	F	Natural hazards	Climate change & natural hazards	Undertaking baseline studies to identify the strengths and weaknesses of disaster reduction programmes	Diagnostic study on poverty levels
154	F	Monitoring and Evaluation	Monitoring and Evaluation	Measures to evaluate environmental impacts must be introduced and the principle of precaution must come into play	Diagnostic study on poverty levels
155	E	Aquaculture	Aquaculture	Study to determine the aquaculture potential of the different states must be made to provide conclusions that will support decisions on how to develop the sector in the various departments in country, both inland and on the coast. [aimed at determining the target species, selection of cultivation techniques, categorization of most suitable areas, identification of water or structural needs, conditions and opportunities for commercial exploitation, financial needs, etc.][some of the opportunities to be analyzed are options for managing aquaculture integrated with irrigation, farming of continental species tanks at different scales and intensities and farming in tanks or enclosures in salt or sea waters; the selection of species with best market perspectives or highest commercial value, the use of foreign species for farming or the farming of non-food species are other aspects to be studied]	Diagnostic study on poverty levels
156	E	Aquaculture	Aquaculture	An information system could be designed and implemented to include basic data on the sector such as the number of facilities/units of cultivation, active or inactive condition, geographical location, water use, cropping patterns, crop species and their production, human resources involved, availability of agricultural products for inputs, closest rural and urban centre of population, markets, etc. This system may take the form of a Geographic Information System .	Diagnostic study on poverty levels
157	E	Aquaculture	Aquaculture	Carry out projects to improve the production conditions of the growth units which are in operation ... They should also assess the technological needs of energy supply and technology for the cultivation among others, and boost their acquisition, operation and maintenance.	Diagnostic study on poverty levels

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
158	E	Aquaculture	Aquaculture	Pilot culture project on a commercial scale, ..., taking into account the results of small-scale projects that are being developed to propose the location and cultural practices which are more appropriate to the situation of each country.	Diagnostic study on poverty levels
159	B; C	Invasive alien species	Invasive alien species	Identify priority species and pathways for immediate monitoring, containment and control	Regional IAS Strategy & Action Plan
160	B; C	Invasive alien species	Invasive alien species	Refer to existing data, historical records and institutional knowledge to create baseline status of species	Regional IAS Strategy & Action Plan
161	B; C	Invasive alien species	Invasive alien species	Develop reference list of species	Regional IAS Strategy & Action Plan
162	B; C	Invasive alien species	Invasive alien species	Identify priority invasive species using risk assessment, pathway analysis and niche modeling	Regional IAS Strategy & Action Plan
163	B; C	Invasive alien species	Invasive alien species	Identify priority invasive species based on invasive species established in countries with similar habitats	Regional IAS Strategy & Action Plan
164	B; C	Invasive alien species	Invasive alien species	Develop protocols and provide assistance for the development of National species reference collections	Regional IAS Strategy & Action Plan
165	B; C	Invasive alien species	Invasive alien species	Develop and strengthen linkages with taxonomic institutions and experts within and outside the Region such as BioNet and CariNet	Regional IAS Strategy & Action Plan
166	B; C	Invasive alien species	Invasive alien species	Develop and implement a regional research plan on IAS and provide support for implementation of national research plans	Regional IAS Strategy & Action Plan
167	B; C	Invasive alien species	Invasive alien species	Investigate the environmental, economic and other impacts of IAS whose impacts are unconfirmed but suspected to be serious	Regional IAS Strategy & Action Plan

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
168	B; C	Invasive alien species	Invasive alien species	Investigate the risk associated with biological control agents and programmes	Regional IAS Strategy & Action Plan
169	B; C	Invasive alien species	Invasive alien species	Develop or review and adapt protocols and guidelines to assist national agencies in implementing biological control programmes	Regional IAS Strategy & Action Plan
170	B; C	Invasive alien species	Invasive alien species	Promote and provide assistance to the development and implementation of National monitoring plans for IAS	Regional IAS Strategy & Action Plan
171	B; C	Invasive alien species	Invasive alien species	Identify priority habitats or ecosystems severely impacted by IAS for rehabilitation or restoration	Regional IAS Strategy & Action Plan
172	B; C	Invasive alien species	Invasive alien species	Adopt or develop protocols for rehabilitation or restoration of IAS impacted sites	Regional IAS Strategy & Action Plan
173	B3; C2;	FAD fisheries	Pelagic species, fisheries and ecosystems	Although the newly introduced, modified FAD showed superior performance in Dominica, research should be continued for further technological improvements, such as for the minimization of FAD submersion and loss and maximization of operation days, taking into account cost performance	JICA Master Plan Study
174	E	Aquaculture	Aquaculture	The feasibility of sustainable small-scale tilapia aquaculture should be tested and verified	JICA Master Plan Study
175	E	Aquaculture	Aquaculture	Determine more accurate PER (net growth in weight/net amount of protein) and maximum feeding rate of each feed (fermented rice bran, commercial feed, regular rice bran, mill feed) for the purpose of minimizing the feeding cost while securing survival rate as well.	JICA Master Plan Study
176	E	Aquaculture	Aquaculture	Examine the method of fermentation of alternative feed focusing on the improvement of its digestibility	JICA Master Plan Study
177	E	Aquaculture	Aquaculture	Examine the effect of pelletized alternative feed with emphasis on reducing the unutilized portion of the feed.	JICA Master Plan Study

ID#	SO/ OR	Original Category	Subject Areas	Research Recommendation (as stated in source document)	Source (Shortened Reference)
178	C	FAD fisheries	Pelagic species, fisheries and ecosystems	Conduct further research and development of the existing FAD fishery co-management program in the core countries	JICA Master Plan Study
179	B3; C1; C2	Shrimp fishery	Continental shelf species, fisheries and ecosystems	It is necessary to conduct by-catch surveys with collaboration of industrial fisheries.	JICA Master Plan Study
180	C	Small-scale fisheries	Small-scale fisheries	It is recommended to investigate tourism and other sectors' activities as alternative income sources for small-scale fishers.	JICA Master Plan Study
181	E	Aquaculture	Aquaculture	Careful marketing survey and technical investigation are required before implementation of aquaculture development so that ecologically, socially and financially sustainable aquaculture is realized.	JICA Master Plan Study
182	C; D; H5	Governance	Policy, Governance & management	Develop and coordinate integrated and sectoral research strategies in support of the implementation of broader ocean governance in the region, with a short and medium term focus on sLMR management	CLME+ SAP

APPENDIX 4. COPY OF CIRCULAR TO MEMBER STATES REQUESTING THEIR REVIEW AND INPUTS ON THE DRAFT RESEARCH AGENDA



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CIRCULAR

TO: Chief Fisheries Officer / Directors of Fisheries / Fisheries Administrator, CRFM Member States

Cc: Permanent Secretaries with responsibilities for Fisheries, CRFM Member States
Dr. Susan Singh-Renton, Deputy Executive Director, CRFM Secretariat
Ms. Elizabeth Mohammed, Programme Manager, Research and Resource Assessment, CRFM Secretariat

FROM: Milton Haughton
Executive Director

DATE: 6 March 2015

RE: Development of CRFM Fisheries and Aquaculture Research Agenda - Review and Inputs by Member States

The CRFM's Strategic Plan for the period 2013 to 2021 mandates under Strategic Objective B2 that: *A regional (collaborative) fisheries and aquaculture research agenda is effectively implemented through annual scientific meetings, joint species specific Working Groups, and targeted research projects and in collaboration with national, regional and international academic and research institutions.* Such a research agenda is intended to: (1) strengthen the science-policy interface in fisheries and aquaculture in the region; (2) facilitate more strategic and efficient deployment of the resources of the Mechanism; and (3) strengthen the linkages between the Mechanism and academic and research institutions at the national, regional and international levels.

To guide the execution of research activities towards achieving Strategic Objective B2 the Secretariat has compiled a draft research agenda (excel workbook file attached) which lists research recommendations at the regional level as proposed in a number of regional policies, strategies and action plans as well as in reports of regional level stock assessments and fisheries analyses conducted at the CRFM's Annual Scientific Meetings. Other reports of the CRFM published within the last two years were also consulted.

The 24th Meeting of the Executive Committee of the Caribbean Fisheries Forum approved the process for engagement of Member States as well as national, regional and international academic and research institutions in the review and finalization of the research agenda. This process involves the following steps:

Towards Sustainable Development of Fisheries for the People of the Caribbean

1. CRFM Member States are to be engaged to review, provide inputs and prioritize the activities listed in the draft research agenda during the period 06 to 20 March 2015;
2. Following incorporation of inputs from all Member States, the draft research agenda will be forwarded to academic/research institutions for identification and prioritization of potential areas for collaboration with the CRFM. This is scheduled to take place between 17 April and 15 May 2015;
3. Finally the research agenda with all inputs incorporated, activities prioritized and collaborators identified, will be forwarded to the Executive Committee no later than 30 June 2015, for its review and also for endorsement to facilitate timely commencement of implementation in the intersessional period.

To facilitate the process the Secretariat would greatly appreciate if your department could undertake the following tasks.

1. Spend a few moments to review the various worksheets in the attached file (excel workbook) containing the draft research agenda. The actual research agenda matrix is found in the worksheet entitled "*Working Doc-Research Activities*", and this is the main sheet requiring your inputs.
2. Include under column entitled "*Research Recommendation (as stated in source document)*" any research activities which may have been inadvertently omitted from the source documents listed.
3. Identify any other regional policy documents, strategies or action plans of relevance to developing the research agenda and include details under column entitled "*Source (Shortened Reference)*" as well as worksheet entitled "*Full List of References*".
4. List any new research recommendations at the regional level from documents identified at (3) under column entitled "*Research Recommendation (as stated in source document)*".
5. Prioritize each of the research recommendations in the full list in column E. To guide you swiftly through the exercise, recommendations have also been categorized (see column C of the worksheet), and relevant keywords are given (see column D of the worksheet). Please use the following scale to indicate your priorities: 0: not applicable; 1: high priority; 2: medium to high priority; 3: medium priority; 4: medium to low priority; 5: low priority. Please insert the respective priority scale number in column G, entitled "*Country Priority*".
6. Insert any comments of your Division pertaining to the specific research recommendation in the column entitled "*Comments*".
7. Highlight all cells with your Division's/ Department's inputs in yellow.
8. Submit your completed workbook to the Secretariat (secretariat@crfm.int and crfmsvg@crfm.int), copied to the Programme Manager Research and Resource Assessment (elizabeth.mohammed@crfm.int), by Friday **20 March 2015**.

The length of the list of research recommendations is reflective of the number of recommendations agreed by the CRFM Member States over the years. For purposes of transparency, the wording in the original documents have been retained, to the extent possible, to remain faithful to the original interpretation. As a consequence, recommendations range from the general to the very specific and some topics are repeated in various contexts. If your Department has further guidance on the research recommendation, please provide your comments in column H of the "*Working Doc-Research Activities*" worksheet.

The Secretariat looks forward to your Department's support and timely feedback towards finalization of the CRFM's Fisheries and Aquaculture Research Agenda.

Kindest regards.

APPENDIX 5. COPY OF FORM LETTER TO ACADEMIC AND RESEARCH INSTITUTIONS, REGIONAL PARTNERS AND RELEVANT REGIONAL INSTITUTIONS REQUESTING FEEDBACK ON THE DRAFT RESEARCH AGENDA TO IDENTIFY POTENTIAL COLLABORATORS



Our file:

29 April 2015

[insert name of Head of Organization and address here]

Dear [insert name]

RE: Caribbean Regional Fisheries Mechanism (CRFM) - Fisheries and Aquaculture Research Agenda – Identification of Potential Collaborators

The CRFM Secretariat presents its compliments to you and to your Institution. This letter has been sent to you either because your institution already collaborates with the CRFM in various aspects of research, your institution has expressed interest in working with the CRFM, or your organization has been identified as a potential research collaborator. Collaboration with the CRFM represents opportunity for researchers, graduate students and other members of academia to identify research areas of policy relevance that address critical issues in fisheries management and aquaculture currently being faced in the Caribbean region. Our research outputs can be published in our Fishery Reports, Research Paper Collection or Technical and Advisory Documents, as well as in the primary literature. There is also the opportunity to build linkages with key researchers and institutions and to develop the professional experience that increases the chances of selection for consultancy work in the region.

If you are not already aware, the CRFM is an inter-governmental organization with the mission “*To promote and facilitate the responsible utilization of the region's fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region*”. Additional information about the Mechanism, including the agreement establishing the CRFM and our Strategic Plan for the period 2013 to 2021, may be found on our website at www.crfm.int.

In accordance with our mission the CRFM has developed a number of agreed policies, strategies and action plans, and our 17 Member States are committed to implementing these instruments. These instruments, along fisheries analyses and stock assessments and projects conducted by the CRFM, have informed the compilation of an extensive working list of research recommendation that is being incorporated into a CRFM Fisheries and Aquaculture Research Agenda (see attached EXCEL workbook). The CRFM Fisheries and Aquaculture Research Agenda will serve as a formal reference for research project negotiation.

In this regard, I have the honour to invite your Institution to indicate in the attached excel file those areas of research that are of interest, which can form the basis for a formal collaborative arrangement with the CRFM, so as to advance implementation of the Research Agenda. If there are specific areas of research which are likely to attract funding by your Institution, kindly indicate these as well. Instructions for reviewing the Research Agenda and providing your inputs are listed in the worksheet named “Instructions

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– Review & Inputs”. If your Institution is unfamiliar with the CRFM’s work history, the instructions provided offer an option to provide more general responses.

I would greatly appreciate if you could submit your inputs to the Secretariat (secretariat@crfm.int and crfmsvg@crfm.int) and copied to the Programme Manager, Research and Resource Assessment (elizabeth.mohammed@crfm.int) by *Monday 01 June 2015*.

Yours faithfully,

Milton Haughton
Executive Director, CRFM Secretariat

cc. Dr Susan Singh-Renton, Deputy Executive Director, CRFM Secretariat
Ms Elizabeth Mohammed, Programme Manager Research and Resource Assessment, CRFM Secretariat

APPENDIX 6. DETAILED CONTACT LIST OF ACADEMIC AND RESEARCH INSTITUTIONS, REGIONAL PARTNERS AND RELEVANT REGIONAL INSTITUTIONS

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APPENDIX 7. COPY OF FORM LETTER TO DONOR AGENCIES TO WHICH THE DRAFT RESEARCH AGENDA WAS CIRCULATED FOR REVIEW AND FEEDBACK TO IDENTIFY POTENTIAL DONOR PARTNERS



Our file:

29 April 2015

[insert name of Head of Agency and address here]

Dear [insert name]

SUBJECT: Caribbean Regional Fisheries Mechanism (CRFM) - Fisheries and Aquaculture Research Agenda – Identification of Potential Donor Partners

The Caribbean Regional Fisheries Mechanism (CRFM) Secretariat presents its compliments to you and to your Organisation. This letter has been sent to you either because your Organisation already provides financial support to the CRFM for implementation of various aspects of research or your Organisation has been identified as a potential donor in this respect. Our research focuses on a wide range of issues from policy and governance to climate change and disaster risk management, biology, ecology, socio-economics, energy efficiency, illegal, unreported and unregulated fishing, key aspects of aquaculture development, invasive alien species, fisheries and resource valuation, among other areas. Outputs can be published in our CRFM Publication Series as well as in the primary literature, with the respective visibility and acknowledgement attributed to donor partners.

If you are not already aware, the CRFM is an inter-governmental organisation with the mission *"To promote and facilitate the responsible utilization of the region's fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region"*. Additional information about the Mechanism, including the Agreement Establishing the CRFM and our Strategic Plan for the period 2013 to 2021, may be found on our website at www.crfm.int.

In accordance with our mission the CRFM has developed a number of agreed policies, strategies and action plans, and our 17 Member States are committed to implementing these instruments. These instruments, along with fisheries analyses, stock assessments, and projects conducted by the CRFM, have informed the compilation of an extensive working list of research recommendations that is being incorporated into a CRFM Fisheries and Aquaculture Research Agenda (see attached EXCEL workbook). The CRFM Fisheries and Aquaculture Research Agenda will serve as a formal reference for research project negotiations.

In this regard, I have the honour to invite your Organisation to indicate in the attached excel file those areas of research in which your Organisation may be interested in providing financial support, and which can form the basis for a formal collaborative arrangement with the CRFM, so as to advance implementation of the Research Agenda. If there are specific areas of research which are also likely to attract technical assistance by your Organisation, kindly indicate these as well. Instructions for reviewing the Research Agenda and providing your inputs are listed in the worksheet named "Instructions – Review

Towards Sustainable Development of Fisheries for the People of the Caribbean

& Inputs”. If your Organisation is unfamiliar with the CRFM’s work history, the instructions provided offer an option to provide more general responses.

I would greatly appreciate if you could submit your inputs to the Secretariat (secretariat@crfm.int and crfmsvg@crfm.int) and copied to the Programme Manager, Research and Resource Assessment (elizabeth.mohammed@crfm.int) by *Monday 1 June 2015*.

Yours faithfully

Milton Haughton
Executive Director, CRFM Secretariat

cc. Dr Susan Singh-Renton, Deputy Executive Director, CRFM Secretariat
Ms Elizabeth Mohammed, Programme Manager Research and Resource Assessment, CRFM Secretariat

APPENDIX 8. CONTACT LIST OF DONOR AGENCIES

African, Caribbean and Pacific Group of States

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Hon. Rob Nicholson
Minister of Foreign Affairs
Department of Foreign Affairs, Trade and Development
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AND

House of Commons
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President
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Chair of the Management Board
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Caribbean Development Bank
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Global Environment Facility (GEF)

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CEO and Chairperson
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Inter-American Development Bank (IDB)

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President
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Australian International Aid

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Affairs and Parliamentary Secretary to the Minister
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Department of Foreign Affairs and Trade
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APPENDIX 9. RESEARCH RECOMMENDATIONS PRIORITIZED BY CRFM MEMBER STATES

See *Appendix 3* for details of each research recommendation by matching the respective ID#s.

COLUMN HEADINGS: BA = Barbados; BE = Belize; GR = Grenada; MO = Montserrat; SVG = St Vincent and the Grenadines; TT = Trinidad and Tobago; TCI = Turks and Caicos Islands.

PRIORITIZATION KEY: 0 = not applicable; 1 = high priority; 2 = medium to high priority; 3 = medium priority; 4 = low to medium priority; 5 = low priority; Y - indicated as a broad area of interest but was not prioritized therefore entry is based on interpretation of the Secretariat; Δ - See comments in Appendix 10.

Estimated Regional Priority Level is based on the weighted average response of the 7 CRFM Member States, excluding '0' and blank responses.

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
1	2	1	2	4	1	5	2	2.4
2	2	1	5	4	5	4	2	3.3
3	5		2	5	5	1	5	3.8
4	4	1	4	5	1	4	2	3
5	3	1	2	5	3	3	1	2.6
6	2	2	3	5	5	5	2	3.4
7	1		1	4	4	3	2	2.5
8	2	2	2	4	1	3	3	2.4
9	3		3	5	2	3	3	3.2
10	4		1	4	1	1	5	2.7
11	4		1	4	1	1	5	2.7
12	4	1	1	4	1	1	2	2
13	5		1	4	3	1	2	2.7
14	5	2	1	2	3	4	3	2.9
15	5		1	2	3	4	5	3.3
16	5		1	2	3	5	5	3.5

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
17	5		1	2	1	3	5	2.8
18	4		2	2	1	3	4	2.7
19	5		1	1	3	3	3	2.7
20	3		1	4	1	2	3	2.3
21	2	4	1	4	1	2	4	2.6
22	1	1	1	3	1	1	1	1.3
23	3	1	2	3	5	3	3	2.9
24	1		1	1	1	2	2	1.3
25	1		1	1	1	2	2	1.3
26	1		1	1	1	3	2	1.5
27	1		1	4	1	3	3	2.2
28	2		2	3	1	4	2	2.3
29	3		3	2	1	5	4	3
30	1	2	1	1	1	1	2	1.3
31	1		3	1	1	4	3	2.2
32	3		1	1	1	3	3	2
33	1		1	2	1	3	2	1.7
34	3		3		4	3	3	3.2
35	3		1	1	1	1	2	1.5
36	1		1	1	1	1	1	1
37	3		3	1	1	4	2	2.3
38	3		1	1	1	1	1	1.3
39	1		1	1	1	2	2	1.3
40	1		1	1	1	2	1	1.2

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
41	2		1	2	1	4	2	2
42	3		1	2	1	3	1	1.8
43	1	1	1	1	1	3	4	1.7
44	3		1	3	1	4	4	2.7
45	1		1	3	1	3	4	2.2
46	1		1	1	1	3	4	1.8
47	3		1	1	1	5	2	2.2
48	1	2	1	1	1	5	2	1.9
49	1	2	1	1	1	5	2	1.9
50	1	3	1	1	1	3	2	1.7
51	2		1	1	2	5	2	2.2
52	2		1	1	1	4	2	1.8
53	2	3	1	1	1	4	2	2
54	3		1	1	1	4	2	2
55	1		1	1	1	4	2	1.7
56	4		1	1	1	5	2	2.3
57	2		1	1	1	3	2	1.7
58	5		2	1	1	5	2	2.7
59	2	2	1	2	1	2	1	1.6
60	1	2	1	2	1	2	2	1.6
61	2	1	1	2	1	2	1	1.4
62	1		1	2	5	2	5	2.7
63	1		1	3	0	2	5	2.4
64	2		1	3	0	1	5	2.4

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
65	2		1	3	5	2	5	3
66	1		1	3	5	2	5	2.8
67	2		1	3	4	2	5	2.8
68	1		1	3	0	1	5	2.2
69	2		3	3	4	3	5	3.3
70	3	3	2	1	5	3	2	2.7
71	1		1	1	3	3	2	1.8
72	3		1	1	1	1	1	1.3
73	1		2	1	1	3	2	1.7
74	3		1	2	1	3	3	2.2
75	3		3	2	1	4	2	2.5
76	2		1	2	1	2	3	1.8
77	3		2	2	3	2	2	2.3
78	1		1	2	1	3	3	1.8
79	2		1	2	1	4	3	2.2
80	2		1	2	1	1	3	1.7
81	2		1	1	1	1	3	1.5
82	1		1	1	1	1	2	1.2
83	1		1	1	1	1	2	1.2
84	2		1	1	1	1	2	1.3
85	1		1	1	3	1	2	1.5
86	5		1	1	1	1	2	1.8
87	5		1	1	1	1	2	1.8
88	1		1	1	1	1	3	1.3

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
89	5		4	2	1	4	3	3.2
90	3	2	1	3	1	3	3	2.3
91	3	1	1	3	1	3	3	2.1
92	4		4	2	1	4	4	3.2
93	1		3		1	3	4	2.4
94	4		1	2	1	4	2	2.3
95	1		2	3	1	4	3	2.3
96	1		2	3	1	3	2	2
97	3		2	2	1	2	2	2
98	5	3	2	2	1	2	1	2.3
99	2		2	2	1	2	2	1.8
100	1		2	2	1	3	4	2.2
101	4	2	1	3	1	4	2	2.4
102	4		1		1	2	2	2
103	4	2	1	3	2	2	2	2.3
104	4	1	1	3	1	2	1	1.9
105	4	2	1	3	1	2	1	2
106	4	1	1	3	1	2	1	1.9
107	3	1	1	3	1	2	2	1.9
108	3		1	3	1	2	1	1.8
109	4	1	1	3	1	2	1	1.9
110	2		2	4	5	4	4	3.5
111	2		2	4	5	2	3	3
112	3		1	4	5	3	4	3.3

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
113	3		1	3	1	1	3	2
114	3		1	3	4	1	3	2.5
115	3		1		4	1	2	2.2
116	2		1		1	1	1	1.2
117	5		0	0	0	0	0	5
118	5		5	0	0	3	5	4.5
119	5		5	0	0	3	5	4.5
120	5		5	0	0	2	5	4.3
121	5		5	0	0	2	5	4.3
122	5		5	0	0	2	5	4.3
123	5		5	0	0	1	5	4
124	5		5	0	0	2	5	4.3
125	3		1	1	1	3	2	1.8
126	2		1	1	1	1	2	1.3
127	3		2	1	2	2	3	2.2
128	3		2	1	1	2	3	2
129	5		1	1	1	2	3	2.2
130	4		1	1	2	3	3	2.3
131	4		1	1	1	2	3	2
132	3		1	1	1	2	3	1.8
133	5		1	1	1	2	3	2.2
134	2		1	1	1	1	1	1.2
135	4	3	1	3	1	2	2	2.3
136	4	3	1	3	1	2	2	2.3

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
137	4	1	1	3	1	1	2	1.9
138	2		1	3	1	1	2	1.7
139	5		5	1	1	1	5	3
140	1		1	1	1	1	1	1
141	2	1	1	2	1	2	1	1.4
142	4		1	3	2	2	3	2.5
143	1		1	3	1	1	3	1.7
144	2		2	3	2	3	3	2.5
145				1	2		2	1.7
146				2	1		3	2
147				2	1		2	1.7
148				1	1		1	1
149				3	4		4	3.7
150				3	4		4	3.7
151				3	4		3	3.3
152				2	3		3	2.7
153				2	3		3	2.7
154				2	1		2	1.7
155				4	3		1	2.7
156				4	3		2	3
157				4	3			3.5
158				4	3		2	3
159				1	1		3	1.7
160				1	1		2	1.3

ID#	BA	BE	GR	MO	SVG	TT	TCI	Estimated Regional Priority Level
161				1	1		2	1.3
162				1	1		3	1.7
163				1	1		3	1.7
164				1	1		3	1.7
165				1	3		3	2.3
166				1	3		3	2.3
167				1	1		3	1.7
168				1	1		3	1.7
169				1	2		3	2
170				1	1			1
171				1	1			1
172				1	1			1
173				2	2			2
174				4	1		5	3.3
175				4	1		5	3.3
176				4	1		5	3.3
177				4	1		5	3.3
178				3	1		3	2.3
179				4	5			4.5
180				4	3		2	3
181				4	4		2	3.3
182				1	1		2	1.3

APPENDIX 10. MEMBER STATES' COMMENTS ON SPECIFIC RESEARCH RECOMMENDATIONS

See *Appendix 3* for details of each research recommendation by matching the respective ID#s.

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
1				Need to conduct a feasibility study/ research to verify the socio-economic value of aquaculture production on Montserrat.		There is potential for development of aquaculture in the TCI, particular interest in native species with low environmental impact e.g. sea cucumber. Such projects would require full assessment of current native stocks, habitat availability, and potential environmental impacts. May be beneficial in generating alternative livelihoods and reducing pressure on target species in the local fishery e.g. conch and lobster.
2		market studies already completed for lobster and conch at the national and international levels		There are no local indigenous species produced on the island.		
4	Such surveys unlikely to gather any new information to conclude anything other than Barbados is too land and water scarce to support any large-scale aquaculture	growing interest in aquaculture of sea cucumbers so this assessment is essential to properly guide the development and promotion of these initiatives				Important for determining the most appropriate locations for aquaculture programs, how they could be promoted and managed within the country, and the best channels for working with target countries internationally.

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
5	Degree of interest will vary based on species being considered.	abundance surveys for sea cucumbers conducted, but there is the need for broader research into the biology and ecology of the species; there is also need to increase the spawning success of the <i>H. mexicana</i> , which could provide seed stock for restocking wild populations and possibly also for aquaculture initiatives since there are indications that wild stocks are already experiencing high fishing pressure.	sea urchin & sea cucumber would be of special interest to Grenada		Mangrove crab (<i>Ucides cordatus</i>) would be more important for Trinidad	These would be the most appropriate species for aquaculture, but little research has been conducted in native populations e.g. abundance surveys, ecology etc.
6		possible interest in lobster ranching				Activities at previous conch farm at Providenciales have dwindled following hurricane in 2008; past data on operations but no current data; interest in rejuvenation of this far to support local consumption as well as in lobster ranching if feasible
7	Aquaponics is being promoted as the appropriate form of aquaculture for Barbados					There would be an interest in those techniques with the lowest environmental impacts or potential environmental impacts.

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
8		propose research on the stone crab	Interest in culture of bigeye scad as a bait fishery for the tuna longline fishery			
10	Priority may increase should aquaculture expand in Barbados.					No current fish farming here so not particularly relevant.
11	Priority may increase should aquaculture expand in Barbados.	without cost effective sources of feed development of aquaculture will be a challenge				
12	Farming ornamental species not under purview of FD. Rationale for grouper farming (e.g. for restocking natural populations) needs to be stated to assess priority for FD.					Interest in feasibility of grouper farming before the wild stocks become severely depleted but such a venture should not contaminate wild stocks or be environmentally damaging.
13	Priority may increase should aquaculture expand in Barbados.					
14	No immediate plans for FADs	FAD fishing is not currently conducted but this could be a viable option		Although Montserrat does not have a have a FAD Fishery, there are plans for 2015 to deploy FADs in the waters of Montserrat. Research on the effects of FAD fishing will be required to assist future		Fad fishing is not currently conducted but interest in learning more

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
				monitoring.		
15	Local catch rates of Blackfin tuna are too low to allow meaningful participation in such a sampling program					
16	Local catch rates of Blackfin tuna are too low to allow meaningful participation in such a study					
17	Local catch rates of Blackfin tuna are too low to allow meaningful participation in such a study					
19	Such work not under the purview of the FD					Biorock project in Grand Turk offers opportunity for monitoring certain species and individual corals for such effects.
20						TCI are starting to develop more green energy initiatives so this could be an interesting angle in terms of industry.
21		the benefits of more efficient and affordable engines are recognized but there is concern regarding the likely increase in				

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
		fishing pressure on the resources				
22		an Economic Alternative and Fisheries Diversification Plan was developed with the assistance of The Nature Conservancy to guide the execution of alternative livelihood in Belize, also giving consideration to the impacts of climate change				There is a need for development and diversification of alternative livelihoods, ideally reducing reliance and pressure on natural resources. Facilitating cooperation and communication between agencies and organizations to develop this area would be extremely beneficial yet challenging.
23	Prefer that the rationale include a natural population restocking component given concerns that the natural populations will decline through climate change.	strong support of aquaculture of inland water species in particular				TCI has very little freshwater and developing fresh water aquaculture could therefore introduce a new set of pressures.
24						Study already conducted on flood risk mapping and alleviation, but more research could be developed in this area to look at impacts on fisheries and potential areas where aquaculture may be developed.

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
25						Study already conducted on flood risk mapping and alleviation, but more research could be developed in this area to look at impacts on fisheries and potential areas where aquaculture may be developed.
26						Study already conducted on flood risk mapping and alleviation, but more research could be developed in this area to look at impacts on fisheries and potential areas where aquaculture may be developed.
30		key species of interest are the lobster, conch and sea cucumber				
34	Gender analyses should be incorporated into all projects. See this as a review of literature					
37						Research into the importance of mangroves to local fisheries would be important in the TCI.
39	Linked to projects under climate change/needs rationalization					
41	Linked to projects under climate change/needs rationalization					

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
42	Linked to projects #s 40, 36, 38, 39,					
43		promoting the development of deep-slope fisheries but the required equipment, resources and capacity to undertake such assessment are lacking				
46	Too general					
47	Although no immediate plans for FADs in Barbados these comments relate to the need to understand impacts of FAD use by neighbouring territories especially if such use impacts on Barbados fisheries. (can be worded differently)					TCI does not currently use FADs but it would be something interesting to consider in more detail.
48		link with the development of the deep slope fishery.				
49		link with the development of the deep slope fishery.				
50		necessary during the trial phase.				
51	Environmental degradation by FADs?					
53	Linked to valuation					

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
	projects					
58	Are there peculiar SPS/marketing measures for species caught by FADS?					
59	all fisheries?	important to estimate the true value of the fishery relative to the macro-economic goals set by Government.				
60	Identification of underutilised/unutilised species	this is linked to provision of additional economic alternatives to the fishing communities.				
61		Belize already collaborates with OSPESCA with regard to lobster fisheries				Collaboration regarding lobster and conch fisheries would be beneficial.
62	Prefer to see impact of <i>Sargassum</i> on flyingfish [including catchability] investigated					
70						Some research already conducted on food security and reliance of seafood, and t current research being conducted in conjunction with Universities in the UK regarding seagrass beds and food security.

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
71		include jelly fish as the warming of the oceans coupled with the increase in nutrients has resulted in tremendous increase in numbers				
72	Data on fishing vessels?					There is a need for better assessment and understanding of the extent of IUU in the TCI, and the methods of IUU that are taking place.
73						Illegal fishing of finfish should also be assessed, alongside other target species. There is a need for adaptation and implementation of international and regional guidelines, and for support in order to make this feasible.
75					Sharks (both pelagic and demersal) and their role in the ecosystem and associated management issues are of national importance.	With recently introduced longline fisheries in the TCI, studies to gain an understanding of the fishery are critical.
76	Inherent value already known, not sure that putting an empirical value is a priority activity compared to efforts to assess the					

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
	sustainability of the resources					
78	Prefer to see impact of Sargassum on flyingfish [including catchability] investigated					
82	Safe harvesting and handling methods					
86	This is already being done in Barbados					
87	This is already being done in Barbados					
88						
89	only anecdotal reporting of spawning aggregations of conch in Barbados					
90		It is important to form synergies with relevant agencies/organizations .				
91	Link to project # 61, concerning collaboration with OSPESCA on regional research	The stone crab fishery has been in urgent need for potential markets.				The impact of imported fish e.g. tilapia on local fishermen and fisheries should be researched and evaluated.
92	Purpose? Encouragement to develop these? If so say so					

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
94	Why need for this study if there is a working group to address coordination of management measures for lobster?					
98		Include the Goliath and Black Groupers as they are heavily targeted and their numbers are declining; this is necessary for regional management of the meta-population/transboundary species.				Currently research being conducted on the Nassau Grouper including identification of spawning grounds, reproductive biology, and data collection from the fishery. More detailed research is needed regarding stock distribution and density.
101		Belize conducted this study in 2015				Morphometric analysis is ongoing and carried out as part of the conch visual survey.
102						Morphometric analysis is ongoing and carried out as part of the conch visual survey.
103		current assessments are limited to data collected from field surveys however the monitoring of larvae as an indication of recruitment could improve the robustness of the assessments				

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
104		could also complement the rights-based approach being implemented nationally.				A socio-economic analysis of the conch fishery would be highly beneficial, particularly when considering management options and assessing the impacts that restrictions may have.
105		Belize is currently developing an adaptive management framework that will enhance management under data limited conditions.				
106	Done already (for Barbados)	Belize is not currently exploiting its deep water stock as it is believed that this adult stock is feeding the shallow water fishery hence it is important to validate this.				Ongoing with the conch visual survey.
107	IUU for conch not applicable to Barbados	IUU fishing could be greatly impacting this fishery. Current assessments depend on estimates of IUU fishing hence improving these estimates could provide for more robust management.				This is difficult to quantify, particularly with regard to illegal fishing by vessels from a neighbouring country in TCI waters, and local fishermen to some extent. There is a need for increased monitoring of trade through exports and CITES permits.

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
109		Necessary to complement current national assessments and to support the zonation of the Right-based management tool (Managed Access) implemented nationally.			Spatial analysis, GIS mapping of sensitive areas and specific areas of interest for fisheries management are of national interest.	Ongoing with the conch visual survey, but it would be beneficial to identify nursery grounds, and improve knowledge of population density and structure in order to improve management of stocks and increase protection.
110					Priority assessment is based on the assumption that the research recommendation will be expanded to include the entire region.	
111					Priority assessment is based on the assumption that the research recommendation will be expanded to include the entire region.	
112					Priority assessment is based on the assumption that the research recommendation will be expanded to include the entire region.	

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
113	Not if those species are already being studied				Priority assessment is based on the assumption that the research recommendation will be expanded to include the entire region.	
114					Priority assessment is based on the assumption that the research recommendation will be expanded to include the entire region.	
115					Priority assessment is based on the assumption that the research recommendation will be expanded to include the entire region.	
117					The results would be beneficial to other countries harvesting the resource	
135	Small lobster fishery in Barbados	Necessary to complement current research efforts to understand the dynamics of the lobster population and the implementation of the Adaptive				

ID#	Barbados	Belize	Grenada	Montserrat	Trinidad and Tobago	Turks and Caicos Islands
		Management Framework (AMF).				
136		Already completed in Belize				
137		Currently being implemented in Belize				Important for assessing the success of open and closed seasons, and MPAs.
138						Assessment of the success of artificial juvenile lobster habitats in increasing the settlement of lobster larvae is an area of interest
140	Very general					
141	Link to project # 61, concerning collaboration with OSPESCA on regional research	Currently deep sea fishing trials being conducted and catches being assessed				

APPENDIX 11. RESEARCH RECOMMENDATIONS PRIORITIZED BY ACADEMIC AND RESEARCH INSTITUTIONS, REGIONAL PARTNERS AND RELATED AGENCIES

See *Appendix 3* for details of each research recommendation by matching the respective ID#s.

COLUMN HEADINGS: **A** = University of the West Indies (3 campuses combined); **B** = Centre for Resource Management and Environmental Studies (UWI, Cave Hill); **C** = Faculty of Law (UWI, Cave Hill); **D** = French Research Institute for Exploitation of the Sea (IFREMER); **E** = Institute of Marine Affairs; **F** = Caribbean Agricultural Research Development Institute (CARDI); **G** = Caribbean Community Climate Change Centre (CCCCC); **H** = Caribbean Disaster Emergency Management Agency (CDEMA); **I** = Caribbean Fisheries Training and Development Institute (CFTDI); **J** = Caribbean Natural Resources Institute (CANARI); **K** = Caribbean Public Health Agency (CARPHA); **L** = the Fisheries and Aquaculture Sector Organization of the Central American Isthmus (OSPESCA); **M** = Australian National Centre for Ocean Resources and Security (University of Wollongong); **N** = Marine Affairs Program (Dalhousie University); **O** = the Fisheries Centre (University of British Columbia); **P** = Florida Sea Grant Program (University of Florida); **Q** = University of Ghent (Belgium); **R** = University of Southern Mississippi; **S** = Horticulture and Aquaculture Program (University of the Virgin Islands); **T** = Virginia Institute of Marine Science (USA); **U** = Aquaculture and Fisheries Group (University of Wageningen, The Netherlands); **V** = Melbourne Law School (University of Melbourne); **W** = National Oceanic and Atmospheric Administration - Fisheries South East Regional Office; **X** = Fisheries Department of the Institute of Agricultural and Fisheries Research (ILVO, Belgium); **Y** = Network of Co-operating Marine Laboratories (respondent from the University of Southern Florida) - **PRIORITIZATION KEY:** 0 = not applicable; 1 = high priority; 2 = medium to high priority; 3 = medium priority; 4 = low to medium priority; 5 = low priority; Y - indicated as a broad area of interest but was not prioritized therefore entry is based on interpretation of the Secretariat.

ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
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ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
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10	4	0		3						0			0		5		0	2		0	1				
11	5	0		3						0			0		5		0	1		0	1			4	
12	3	0		1	1					0			0		5		4	3		3	2				
13	2	0		1	1					0	Y	1	0		5		0	3		4	2				
14	5	4		4						0					4	4	0	1		0	1				
15	2	0		4						0			0		3		0	1		0	1				
16	5	0		1	3					0			0		3		0	1		0	3				
17	4	3		4	2					0			0		5		0	1		0	1				
18	5	5		0			3	0		2			0		0		0	3		5	4		0		
19	3	3		0			1	3		5			0	2	2		3	3		5	1		3		Y
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23	4	0		1			3	4		0					5		0	2		0	2		0		
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25	1	1		0		3	1	1		1	Y				2		2	1		3	3		0		Y
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28	3	2		0			1	3		0	Y			2	5		2	1		0	1		0		
29	1	0		0			2	2		0	1				0		0	1		2	5		0		Y
30	2	3		0		3	1	2		3			0	2	2		0	1		0	2		3		Y
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ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
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83	2	3		Y	3					3			0		5		0	3		5	2		5		Y
84	2	3		Y	3					4			0		5		0	1		5	2		4		Y
85	4	5		Y						5	Y		0		0		0	3		0	5		5		
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106	4	3		2						0			0		4		0	1		0	2		2		Y
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110	3	2		2						0					4		0	1		0	2		5		
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ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
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115	4	4		3						0					2		0	1		5	4		3		
116	3	2								5				2	2		0	3		4	3		4		
117	4	3		0						3			0		5		1	3		0	5		0	1	
118	4	4		0						4			0		4		2	2		0	2		0	2	
119	4	4		0						0			0		5		0	3		0	5		0	2	
120	4	4		0						0			0		4		0	3		0	1		0		
121	3	0		0						0			0		4		0	1		0	2		0		
122	4	0		0						0			0		4		0	1		0	1		0		
123	3	0		0						0			0		4		0	1		0	1		0		
124	3	0		0						0			0		4		0	1		0	3		0		
125	4	0		0						0			0		4		0	1		0	1		3		
126	2	2		2						2					4		0	2		0	2		4		
127	3	4		0						4			0		4		0	3		0	5		3		
128	3	3		0						0			0		4		0	1		0	4		3		
129	3	3		0						4			0		2		0	3		0	2		3		
130	4	3		3						0			0		5		0	1		0	5		4		
131	3	4		3						0			0		5		0	1		0	2		3		
132	4	2		1						2				2	2		0	4		0	2		4		
133	4	1								2			0		2		0	1		0	1		2		
134	3	1		1						1				2	2		0	1		5	1		4		
135	3	4		Y						5			0		2		0	2		4	3		2		
136	4	4		0						0			0		5		0	3		4	4		5		
137	4	4		0						0			0		4		0	3		0	4		2		
138	3	4		0						0			0		4		0	3		0	4		3		Y

ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
139	3	2		0						5			0		4		0	1		0	2		0		
140	2			0						0			0	2	4		0	1		0	1		2		
141	4			0						4			0		5		0	1		0	3		5		
142	3	0		0	1					0			0		5		0	1		0	2		3		
143	1	4		3						0			0		4		0	1		0	1		3		
144	3	2		0						0			0		5		0	1		0	4		4		
145	4	1		0						1				2	2		0	3		0	4				
146	4	3		0						3					4		0	1		0	5		5		
147	3	2		0						4			0		2		0	1		4	2		4		
148	3	3		0						5					2		0	5		0	3	Y	5		
149	4	3		0						2					2		0	1		0	5		5		
150	3	2		0						2					2		0	1		0	5		5		
151	3	2		0						2					2		0	3		0	5		5		
152	3	3		0						3			0	2	4		0	1		0	5		4		
153	2	2		0						2			0	2	4		0	1		0	5		4		
154	3	3		0						3			0		2		0	1		0			3		
155	3	0		1						0			0		5		0	4		5	1				
156	4	3		3						0			0		5		0	4		0	3				
157	2			0						0			0		5		0	4		0	4				
158	3	0		2						0			0		5		0	2		0	5				
159	3	5		0						5			0		5		0	1		0	4		0		Y
160	3	4		0						5			0		5		0	1		0	4		0		
161	2	0		0						0			0		5		0	1		0	4		0		
162	4	0		0						0			0		4		0	3		0	4		0		
163	2	0		0						0			0		5		0	3		0	4		0		
164	3	0		0						0			0		5		0	1		0	4		0		

ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
165	2	0		0						0			0		5		0	1		0	5		0		
166	3	0		0						0			0		5		0	3		0	4		0		
167	3	0		0						0			0		5		0	3		0	4		0		Y
168	3	0		0						0			0		5		0	0		0	5		0		
169	3	0		0						0			0		5		0	3		0	4		0		
170	3	0		0						0			0		5		0	1		0	5		0		
171	3	0		0						0			0		5		0	1		0	4		0		
172	3	0		0						0			0		5		0	1		0	5		0		
173	4	3		0						0			0		0		0	2		0			5		
174	1	0		0						0			0		0		0	1		0	2				
175	4	0		3						0			0		0		0	3		0	1				
176	4	0		0						0			0		0		0	0		0	1				
177	3	0		3						0			0		0		2	3		0	1			3	
178	3	3		2						3					0		0	1		0	1		5		
179	3	0		0						0			0		0		0	3		0	3		0	4	
180	3	1		2						1					0		0	1		0	4		5		
181	4	0		0						0					0		0	1		0	3				
182	1	2	Y	0						2			3	2	0		0	3		0	4		4		

Notes are referenced by column heading and row heading e.g. D85 = column heading D (IFREMER) and ID# 85 (match ID# in Appendix 3)

C92, C95, C182: the Faculty of Law is not involved in scientific or economic research, but possible assistance with related legal issues (agreements or legislation)

D85, D99: possible interest of Comité des Pêches de Guadeloupe

D81, D82, D83, D86, D87, D88: possible interest of Direction Régionale de l'Environnement, de l'Aménagement et du Logement (DREAL – French Administration with responsibility for the Environment)

D72, D73, D74: possible interest with Direction of the Sea (French Maritime Affairs Administration)

I1: specific interest in bait farming (in support of the developing offshore pelagic fishery)

K: in general CARPHA is also interested in the health of fisherfolk in the Caribbean, with particular emphasis on the fact that such persons are from lower income groups, often with issues related to use of alcohol and tobacco and associated chronic NCDs, which regularly impoverishes individuals and families.

ID#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
<p>However, this aspect of research is not reflected in the CRFM’s Research Agenda. The broad research topics identified in the Caribbean Health Research Agenda are considered research priorities within their respective CCH III programme areas, for implementation by researchers/research institutions in the Region.</p> <p>K82, K85: interest in ciguatera poisoning in general</p> <p>K70: main interest in food and nutrition security in general and in sanitary and phyto-sanitary issues</p> <p>K13: main interest in the health aspects of aquaculture</p> <p>K29: related to Programme Area on Environmental Health (Institutions Strengthening) – research priorities on the relationship between climate change and health and food safety (Caribbean Health Research Agenda ID#7) and the on disaster risk and population health in the Caribbean.</p> <p>K25: related to Programme Area on Environmental Health (Institutions Strengthening) – research priority on the relationship between climate and health and food safety (Caribbean Health Research Agenda ID# 7)</p> <p>K28: related to Programme Area on Environmental Health (Solid Waste Management) – research priorities on waste reduction/minimization (CHRA ID#6) and alternative energy projects (Caribbean Health Research Agenda ID# 11)</p> <p>K26: related to Programme Area on Environmental Health (Water Resources Management) – research priorities on the impact of climate change on water resource management (Caribbean Health Research Agenda ID# 6) and on disaster risk and population health in the Caribbean;</p> <p>N182: possible involvement through the CLME+ Project</p> <p>V73, V90: note the assignment to this activity is based on the Secretariat's interpretation of the response - the stated general interest is in research into trade measures to address IUU fishing</p> <p>X117, X118, X119, X179: involved in several projects on seabob fisheries in Suriname and Guyana; conducted studies on sustainability of seabob trawling in Suriname towards MSC certification; interest in population dynamics of the Suriname/Guyana seabob stock and an ecosystem-approach to seabob fisheries in the area</p> <p>Y40: coral reefs: a major area of general ecological research within C-2, with special attention to the impact of climate change, ocean acidification, land-based sources of pollution and fishing</p> <p>Y19, Y24, Y25, Y26, Y29, Y30, Y32, Y35, Y36, Y37, Y38: great interest in climate change especially the distribution, structure and functioning of coral reef, seagrass and mangrove ecosystems as well as associated commercially fished species associated; climate change and sea level rise impact on ecosystem services and evaluation, particularly related to tourism, coral and other diseases, spread of invasive species and distribution changes of native species</p> <p>Y31: great interest in climate change especially the distribution, structure and functioning of coral reef, seagrass and mangrove ecosystems as well as associated commercially fished species associated; climate change and sea level rise impact on ecosystem services and evaluation, particularly related to tourism, coral and other diseases, spread of invasive species and distribution changes of native species; Interest in lionfish and other invasive species: spread, impact, and potential control measures</p> <p>Y71, Y78, Y80, Y81, Y83, Y84, Y86, Y87, Y88, Y159, Y167: Interest in lionfish and other invasive species: spread, impact, and potential control measures</p> <p>Y103, Y105, Y106, Y138: interest in key coastal fishery species, such as queen conch and spiny lobster: status and trends of populations under fishing and climate change impacts.</p> <p>Y43: several C-2 laboratories are engaged in deep reef slope scuba surveys including spawning aggregations</p>																									

APPENDIX 12. POTENTIAL SOURCES OF FUNDING

See *Appendix 3* for details of each research recommendation by matching the respective ID#s.

COLUMN HEADINGS: **D** = French Research Institute for Exploitation of the Sea (IFREMER); **E** = Institute of Marine Affairs; **F** = Caribbean Agricultural Research Development Institute (CARDI); **G** = Caribbean Community Climate Change Centre (CCCCC); **K** = Caribbean Public Health Agency (CARPHA); **L** = the Fisheries and Aquaculture Sector Organization of the Central American Isthmus (OSPESCA); **P** = Florida Sea Grant Program (University of Florida); **R** = University of Southern Mississippi; **V** = Melbourne Law School (University of Melbourne); **AA**=CTA; **AB** = CLME+; **AC** = PPCR; **AD** = CC4FISH; **AE** = REBYC-II LAC; **AF** = CARICOM-GIZ REETA; **AG** = CARIFICO

No potential sources of funding were identified for the follow research recommendations numbered: 2, 4, 5, 7, 9, 10- 11, 14- 15, 23, 34- 35, 40, 43-47, 49-51, 54, 58, 62-64, 70, 76-77, 81, 84-88, 91-96, 98, 100-105, 110-113, 115, 117-123, 124-125, 127-129, 133, 135-137, 144, 149, 151-157, 159-178.

Y = yes; P = possible;

ID#	D	E	F	G	K	L	P	R	V	AA	AB	AC	AD	AE	AF	AG
1										Y						
3								Y								
6	Y					Y										
8	Y	Y														
12		Y														
13	Y	Y				Y										
16		Y														
17		Y														
18													Y			
19				Y												
20				Y											Y	

ID#	D	E	F	G	K	L	P	R	V	AA	AB	AC	AD	AE	AF	AG
21				Y												
22				Y		Y							Y	Y		
24						Y							Y			
25			Y	Y									Y			
26			Y	Y									Y			
27				Y											Y	
28				Y												
29					P								Y			
30			Y	Y								Y	Y			
31							P									
32			Y	Y								Y				
33			Y	Y								Y				
36														Y		
37				Y												
38		Y		Y												
39													Y			
41													Y			
42				Y												
48	Y															Y
52																Y
53													Y			
55							Y									
56							Y									

ID#	D	E	F	G	K	L	P	R	V	AA	AB	AC	AD	AE	AF	AG
57							Y						Y			
59	Y									Y						
60						Y								Y		
61	Y					Y										
65	Y										Y					
66												Y	Y			
67											Y					
68											Y					
69											Y					
71													Y			
72										Y	Y					
73									P							
74										Y						
75	Y															
78													Y			
79												Y				
80													Y			
82		Y			Y											
83		Y														
89	Y															
90									P	Y						
97											Y					
99										Y						

ID#	D	E	F	G	K	L	P	R	V	AA	AB	AC	AD	AE	AF	AG
106	Y															
107	Y															
108	Y															
109	Y															
114		Y														
116														Y		
126	Y															
130	Y															
131	Y															
132	Y															
134	Y										Y			Y		
138											Y					
139											Y					
140											Y	Y	Y			
141													Y			
142		Y														
143	Y															
145										Y						
146										Y						
147														Y		
148										Y	Y					
150											Y		Y	Y		
158	Y									Y						

ID#	D	E	F	G	K	L	P	R	V	AA	AB	AC	AD	AE	AF	AG
179														Y		
180	Y									Y						
181										Y			Y			
182											Y			Y		

Notes are referenced by column heading and row heading e.g. D85 = column heading D (IFREMER) and ID# 85 (match ID# in Appendix 3)

B – Interest indicated in all areas except activities B1-B13, B15-B16, B18, B23, B25, B27, B29, B31, B37-B38, B58, B61, B70, B74-B75, B78, B85, B90-98, B101, B103, B118-125, B127, B135-B138, B140-B143, B155, B157-B172, B174-B177, B179 and B181;

B20, B21: shared interest between CERMES and renewable energy programme at Cave Hill Campus, UWI

B28 – all areas except waste management have ongoing CERMES research and teaching.

D48, D59, D61, D65, D75, D106, D107, D108, D126, D132, D134, D143: possible funding through FIS (Fédération Internationale de Sauvetage Aquatique) Data

G19: joint project being prepared for funding under the Green Climate Fund

G20: Possible funding under SIDS DOCK (Sustainable Energy and Climate Resilience Initiative - an initiative among member countries of the Alliance of Small Island States (AOSIS) to help SIDS transform their energy sectors and address adaptation to climate change)

G21: Possible funding from SIDS DOCK for all renewable energy projects

G22: Possible funding from Green Climate Fund (GCF), Department for International Development (DFID, UK), European Union (EU) for collaborative programs between CCCCC and CRFM

G25: Could seek funding through Kreditanstalt für Wiederaufbau (KfW), EU, Department of Foreign Affairs, Trade and Development (DFATD, Canada)

G26: Ongoing activity of the Centre and now being implemented across the Caribbean -funding through EU Global Climate Change Alliance (GCCA) Program

G27: Possible funding under SIDS DOCK

G28: Possible funding under SIDS DOCK. Possible partnership with UWI, UB, UG to develop curricula and institute training courses.

G30: Centre in the process of developing site specific climate scenarios for all CARICOM countries. Training will at some time be provided for sectoral experts to integrate the scenarios into available impact models.

G32: Part of ongoing impact studies. Partnership with CRFM possible to facilitate study.

G33: Part of ongoing impact studies. Partnership with CRFM possible to facilitate study.

G37: Possible funding under the KfW coastal adaptation project now being implemented by the Centre.

G38: Possible funding under the KfW coastal adaptation project now being implemented by the Centre. In addition possible funding under the GCF, EU Global Climate Change Alliance (GCCA) Program

ID#	D	E	F	G	K	L	P	R	V	AA	AB	AC	AD	AE	AF	AG
<p>G42: Several of these factors -40-42 critical in planning CC adaptation for coral reef system and can be included in regional project proposal to address coral reef vulnerability</p> <p>K82: in discussion with the Government of Japan on a ciguatera research project; possible advancement through Caribbean Aqua-Terrestrial Solutions (CATS) project with GIZ, as well as under the 11th EDF Intra-ACP Strategy</p> <p>AA1: the CTA, ACP and EC are interested, it may be possible to conduct the activity within the private sector as a follow-up to the existing CTA study and to develop a proposal that also includes the other activities listed below activities numbered 59, 72, 74, 148, 90, 99, 145, 146, 158, 180, 181;</p> <p>AA59: the CTA has already discussed this as an area of focus in 2016, the CRFM Executive Director and CTA Senior Programme Coordinator, Knowledge Management</p> <p>AA72, AA74, AA148: The ACP/CTA/EU are interested in best practices as regards IUU fishing;</p> <p>AA90: CTA is interested in intra-regional trade;</p> <p>AA99: possible interest in this area, follow-up required with the Senior Programme Coordinator, ICT 4D Innovation at CTA in Wageningen, the Netherlands</p> <p>AA145, AA146, AA158, AA180: CTA is interested in tourism-related markets</p> <p>AA181: CTA can collaborate on this activity</p>																

APPENDIX 13. REGIONAL PROJECTS AND INITIATIVES CONTRIBUTING TO GENERAL RESEARCH IN FISHERIES AND AQUACULTURE

See *Appendix 3* for details of each research recommendation by matching the respective ID#s.

ID#	Regional Projects and Initiatives
18	CC4FISH - Development of business proposals to facilitate full utilization of key commercial and under-utilized species;
19	CERMES -ongoing work on coral nursery studies in Barbados under the Government's <i>CRMP</i>
20	CARICOM-GIZ REETA - <i>Promoting Sustainable Energy Use in the Fisheries Sector</i> - research in support of helping to improve energy efficiency on all fishing vessels, in fish processing plants and on fish farms within green economy through: (a) conduct of a baseline assessment and gap analysis of the policies, regulations, strategies, action plans and current state of affairs regarding energy efficiency and sustainable energy in the fishing industry in the region; (b) development of policies, recommendations on regulations, strategies and action plans to promote use of more efficient fishing boat designs and most cost effective fish boat propulsions systems encouraging use of indigenous energy sources where possible; (c) development of at least 2 viable business models for: converting a fishing vessel to use sustainable energy; converting a fish processing or handling operation to be powered using indigenous sustainable energy; (d) conversion of at least one vessel and one fish processing and/or handling facility or community to operate on sustainable energy supply by supporting an existing ventures.
22	CC4FISH - development of alternative, improved livelihoods; Also, progress made by The Nature Conservancy and the Biodiversity and Protected Areas Management (BIOPAMA) ; REBYC-II LAC - specific to shrimp and groundfish fisheries management and related By-catch issues - Existing and potential non-fisheries livelihood alternatives for both men and women identified along the value chain, and capacity building support provided accordingly, including promotion of decent work.
24	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability with emphasis on dolphinfish and pelagic fisheries; Local vulnerability assessments;
25	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability with emphasis on dolphinfish and pelagic fisheries; Local vulnerability assessments;
26	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish; Local vulnerability studies

ID#	Regional Projects and Initiatives
27	CARICOM-GIZ REETA - <i>Promoting Sustainable Energy Use in the Fisheries Sector</i> - research in support of helping to improve energy efficiency on all fishing vessels, in fish processing plants and on fish farms within green economy through: (a) conduct of a baseline assessment and gap analysis of the policies, regulations, strategies, action plans and current state of affairs regarding energy efficiency and sustainable energy in the fishing industry in the region; (b) development of policies, recommendations on regulations, strategies and action plans to promote use of more efficient fishing boat designs and most cost effective fish boat propulsions systems encouraging use of indigenous energy sources where possible; (c) development of at least 2 viable business models for: converting a fishing vessel to use sustainable energy; converting a fish processing or handling operation to be powered using indigenous sustainable energy; (d) conversion of at least one vessel and one fish processing and/or handling facility or community to operate on sustainable energy supply by supporting an existing ventures.
29	CC4FISH - Local vulnerability assessments;
30	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish; PPCR - Fisheries and marine ecosystem assessments and analyses and Socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf).
32	PPCR - Fisheries and marine ecosystem assessments and analyses and socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf); CERMES - <i>some work was done under the completed FORCE Project and more is planned.</i>
33	PPCR - Fisheries and marine ecosystem assessments and analyses and socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf).
31	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish
36	Concept Note being developed by Secretariat to seek donor support; CLME + - focus on flyingfish (Value-chain problem solving - feasible options for added value, improved SPS and distribution and marketing); REBYC-II LAC - Value chain analysis with focus on the utilisation of bycatch in shrimp trawl fisheries and the roles of gender and vulnerable groups.
38	Some progress on coral reefs made by the World Resources Institute in Saint Lucia and Tobago.
39	CC4FISH - Local vulnerability assessments;
40	Concept Note being developed to seek donor support

ID#	Regional Projects and Initiatives
41	CC4FISH - Building social resilience through projects re: Use of ICT in Rapid Response; Also FAO/CRFM/CDEMA collaboration with the World Bank to develop an appropriate fisheries insurance facility (informed by needs assessment, risk assessment and identification of feasible insurance options) for the fisheries sector;
44	<i>CERMES - in preliminary discussion with Cooperative Sciences Services LLC (Dolphinfish Research Program) to use Barbados as a Caribbean satellite tagging site for dolphinfish</i>
48	CARIFICO - implementation of a logbook system for FAD fisheries and analysis of respective data
52	CARIFICO - implementation of a logbook system for FAD fisheries and analysis of respective data
53	CC4FISH - Development of an economic model of FAD fisheries to evaluate the costs and benefits of these fisheries currently being promoted as adaptation measures;
55	CARIFICO Project
56	CARIFICO Project
57	CC4FISH - Improved FAD technology - introduction of Smart FADs (these include sonar and GPS capabilities so that the operator can remotely contact it via satellite to determine the population under the FAD);
60	REBYC-II LAC - New products tested, using sustainable bycatch, with a view to reducing discards in shrimp trawl fisheries.
61	Joint Action Plan between the CRFM and OSPESCA to be implemented
65	CLME + - focus on flyingfish (Conduct national censuses of flyingfish fishing vessels, which would allow measurement of fishing capacity required for imposing fishing effort regulations)
66	PPCR - Fisheries and marine ecosystem assessments and analyses and socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf); CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish
67	CLME + - focus on flyingfish (Value-chain problem solving - feasible options for added value, improved SPS and distribution and marketing);
68	CLME + - focus on flyingfish fisheries (Updated and broadened multi-objective assessment of Eastern Caribbean Flyingfish Fisheries; Critical assessment of performance of all components of the policy cycle with recommendations for improvements at each stage of the policy cycle);

ID#	Regional Projects and Initiatives
69	CLME + - focus on flyingfish fisheries (Comprehensive and gender-sensitive valuation (social and economic) of the current and potential future contribution of flyingfish and associated pelagic fisheries to food security (socio-economic), income (costs and earnings) and employment (socio-economic) and ecosystem goods and services (ecological); Development and implementation of activity proposals to facilitate livelihood enhancement, focused either on increasing market or livelihood opportunities from current levels, and taking into account gender equality and youth development considerations; Support for implementation of activity proposals, including hands-on training of the stakeholders involved in proposal development and implementation, as well as core business and management skills)
71	CERMES - <i>ongoing survey of impacts of lionfish on fishers planned in the near future</i> ; <i>Sargassum</i> bring addressed under CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish
72	CLME + - focus on shrimp and groundfish fisheries (Updated information on IUU fishing for shrimp and groundfish, spiny lobster and flyingfish fisheries). Also opportunity under the respective IUU Fishing Working Group established at WECAFC 15 .
78	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish
79	PPCR - Fisheries and marine ecosystem assessments and analyses and socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf).
80	CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish
82	Significant progress of related activities coordinated by the GCFI
83	Some work done under the coordination of GCFI
84	Some work done under the coordination of GCFI
88	Some work done under the coordination of GCFI
94	Already being addressed by the CFMC/OSPESCA/WECAFC/CRFM Working Group on Queen Conch and the OSPESCA/WECAFC/CRFM/CFMC Working Group on Spiny Lobster
97	CLME + - focus on flyingfish (Refinement of operational objectives; indicators and reference points for M&E of implementation of sub-regional FMP for Flyingfish as well as actual M&E of implementation of FMP).
98	May be possible under the CFMC/WECAFC/OSPESCA/CRFM Working Group on Spawning Aggregations
100	CERMES - <i>some research planned in relation to Climate Change Adaptation and Disaster Risk Management and SSF Guidelines;</i>

ID#	Regional Projects and Initiatives
101	Completed by the CRFMC/WECAFC/OSPESCA/CRFM Working Group on Queen Conch
107	Overlap with activities of the IUU Fishing Working Group established at WECAFC 15
111	Overlap with activities of the WECAFC/OSPESCA/CRFM/CFMC/IGFA Working Group on Recreational Fisheries
114	CERMES - <i>some research already done</i>
115	Overlap with activities of the WECAFC/OSPESCA/CRFM/CFMC/IGFA Working Group on Recreational Fisheries
116	Concept Note being developed to seek donor support; REBYC-II LAC - Value chain analysis with focus on the utilisation of bycatch in shrimp trawl fisheries and the roles of gender and vulnerable groups; CERMES - <i>some research already done</i>
119	Also link with activities of the WECAFC/CRFM/IFREMER Working Group on shrimp and groundfish of the North-Brazil Guianas shelf
120	Also link with activities of the WECAFC/CRFM/IFREMER Working Group on shrimp and groundfish of the North-Brazil Guianas shelf
126	Concept Note being developed to seek donor support
132	CERMES - <i>Some work being done under the Too Big To Ignore (Global Partnership for Small-scale Fisheries Research) and FAO Projects</i>
134	Concept Note being developed to seek donor support; CLME + - focus on flyingfish (Comprehensive and gender-sensitive valuation (social and economic) of the current and potential future contribution of flyingfish and associated pelagic fisheries to food security (socio-economic), income (costs and earnings) and employment (socio-economic) and ecosystem goods and services (ecological); Development and implementation of activity proposals to facilitate livelihood enhancement, focused either on increasing market or livelihood opportunities from current levels, and taking into account gender equality and youth development considerations; Support for implementation of activity proposals, including hands-on training of the stakeholders involved in proposal development and implementation, as well as core business and management skills); REBYC-II LAC - Socio-economic assessment of the shrimp trawl fishery
138	CLME + - focus on lobster (Develop common stock assessment model and carry out stock assessment for south-central stock); Also possible under the OSPESCA/WECAFC/CRFM/CFMC Working Group on Spiny Lobster
139	CLME + - focus on shrimp and groundfish fisheries (Updated shrimp and groundfish status reports on catch and effort, biological and socio-economic information disseminated through FIRMS resources and fisheries inventories for 4 participating countries);

ID#	Regional Projects and Initiatives
140	Some progress made by the CRFM and WECAFC Working Groups as well as by the Future of Reefs in a Changing Environment (FORCE) initiative to develop indicators of fishing pressure on reefs with focus on parrotfish; CLME+ - focus is on flyingfish fisheries (Updated and broadened multi-objective assessment of Eastern Caribbean Flyingfish Fisheries; Critical assessment of performance of all components of the policy cycle with recommendations for improvements at each stage of the policy cycle); CLME + - focus on lobster fisheries (Develop common stock assessment model and carry out stock assessment for south-central stock); CLME + - focus on shrimp and groundfish fisheries (Updated shrimp and groundfish status reports on catch and effort, biological and socio-economic information disseminated through FIRMS resources and fisheries inventories for 4 participating countries); PPCR - Fisheries and marine ecosystem assessments and analyses and Socio-economic and ecological climate impact assessments – focusing on 3 main ecosystems (pelagic, reef and continental shelf); CC4FISH - Risk assessment modeling for pelagic fisheries with climate change and variability and modeling growth, abundance and mass-transport of pelagic <i>Sargassum</i> invasions into the Eastern Caribbean and implications for pelagic fisheries - emphasis on dolphinfish and flyingfish
141	CC4FISH - Development of business proposals to facilitate full utilization of key commercial and under-utilized species;
147	REBYC-II LAC - improved catch and effort and biological data collection systems to assess the nature of by-catch in trawl fisheries (catch quantities, species composition by season, area and fishing grounds); including mapping of fishing grounds; testing of by-catch reduction devices
148	CLME + - focus on shrimp and groundfish fisheries (Updated information on IUU fishing for shrimp and groundfish, spiny lobster and flyingfish fisheries). Possible opportunity under the respective IUU Fishing Working Group established at WECAFC 15.
149	CERMES - <i>some research already done</i>
150	CLME+; CC4FISH; REBYC-II LAC
158	CARICOM-Cuba Technical Cooperation in Aquaculture: support for piloting intensive farming of tilapia and Chinese carps, including administration of farming systems, production of fingerlings for farmers and development of a comprehensive system of Aquaculture Sanitary and Biosafety standards.
173	CARIFICO Project
178	CARIFICO Project
179	REBYC-II LAC - improved catch and effort and biological data collection systems to assess the nature of by-catch in trawl fisheries (catch quantities, species composition by season, area and fishing grounds, impacts), including mapping of fishing grounds, identification and testing of by-catch reduction devices; Also link with activities of the WECAFC/CRFM/IFREMER Working Group on shrimp and groundfish of the North-Brazil Guianas shelf
181	CC4FISH - Development of an aquaculture marketing strategy

ID#	Regional Projects and Initiatives
182	<p>CLME + - focus on flyingfish, lobster, shrimp and groundfish; REBYC-II LAC - regional strategy for shrimp/bottom trawl fisheries and bycatch management, national legal frameworks for shrimp/bottom trawl fisheries and bycatch co-management reviewed and amended, institutional structures for EAF and co-management of shrimp/bottom trawl fisheries and bycatch in place. PPCR – generation of advice for decision-making on climate change adaptation and disaster risk management in fisheries; CC4FISH – development of a regional protocol for integrating climate change adaptation and disaster risk management into the Caribbean Community Common Fisheries Policy.</p>

The CRFM is an inter-governmental organization whose mission is to “Promote and facilitate the responsible utilization of the region’s fisheries and other aquatic resources for the economic and social benefits of the current and future population of the region”. The CRFM consists of three bodies – the Ministerial Council, the Caribbean Fisheries Forum and the CRFM Secretariat. CRFM members are Anguilla, Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago and the Turks and Caicos Islands.

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