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**STRATEGIC ACTION PROGRAMME FOR THE  
EFFECTIVE GOVERNANCE AND MANAGEMENT OF  
FLYINGFISH FISHERIES IN THE CARIBBEAN LARGE  
MARINE ECOSYSTEM (CLME)**



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**CRFM Secretariat  
Belize 2012**

# **CRFM Technical & Advisory Document - Number 2012 / 14**

## **Strategic Action Programme for the Effective Governance and Management of Flyingfish Fisheries in the Caribbean Large Marine Ecosystem (CLME)**

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Strategic Action Programme for the Effective Governance and Management of  
Flyingfish Fisheries in the Caribbean Large Marine Ecosystem (CLME)

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## **PREFACE**

The Strategic Action Programme (SAP) described in this report has been completed as part of a contract awarded to the Caribbean Regional Fisheries Mechanism (CRFM) by the Caribbean Large Marine Ecosystem (CLME) Project “*Sustainable Management of the shared Living Marine Resources of the Caribbean Large Marine Ecosystems and Adjacent Regions*”. The aim of the CLME Project is to assist Caribbean countries to improve the management of their shared living marine resources through an ecosystem based approach. The CLME Project began on 1 May 2009 and will end on 30 April 2013.

The Project implementing agency is the United Nations Development Programme (UNDP) in partnership with the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific, Educational and Cultural Organization (UNESCO). The executing agency is the United Nations Office for Project Services (UNOPS).

The goals of the CLME Project are being pursued through regional-level and fishery / ecosystem-specific projects and studies. The Project seeks to evaluate and strengthen the technical-scientific information and knowledge base and to use it to inform the formulation of a SAP that will embrace a shared and ecosystem-based management vision for the CLME, and to document agreed priority actions, i.e. policy, legal and investment reforms for advancing the proposed ecosystem approach.

The CRFM was responsible for executing two case studies for the CLME project that were aimed at strengthening the technical-scientific information and knowledge base and at examining options for promoting an ecosystem approach to fisheries governance for (i) the Eastern Caribbean flyingfish fishery and (ii) the large pelagic fishery. The case studies produced four reports on the review of existing policy, legal and institutional arrangements for the governance and management of each of the two fisheries and stakeholder analyses as well as three data collection improvement reports and scientific meeting reports that document findings of the technical-scientific components of the case studies.

The SAP presented in this report also draws on the draft CRFM/CLME Eastern Caribbean Flyingfish Fishery Case Study – Governance Assessment conducted by the Centre for Resource Management and Environmental Studies (CERMES) of the University of the West Indies (UWI).

The reports, which summarize the results and findings of the study, were reviewed and validated by stakeholders, including stakeholders from the fishery sector, during a validation workshop, held in May 2012, which is under publication as CRFM Technical and Advisory Document. It is hoped that the Strategic Action Programme for the effective governance and management of flyingfish fisheries in the Eastern Caribbean presented in this report will be found useful by all stakeholders concerned and provide guidance on the path to a sustainable management of the shared Living Marine Resources of the Caribbean Large Marine Ecosystem.

## **ACKNOWLEDGEMENTS**

The important contributions of the various stakeholders, who contributed their advice and knowledge to the Strategic Action Programme presented in this report and to the validation workshop, held in May 2012, are gratefully acknowledged. These stakeholders include members of fishing communities, representatives of fishers' associations and cooperatives, fishing and fish processing industries, fisheries administrators, managers, researchers and representatives of other sectors.

Further thanks go to the staff of the CRFM Secretariat for their support and collaboration in the preparation of this document, Susan Singh-Renton, as well as to Milton Haughton, who provided the overall technical guidance to the preparation of this Strategic Action Programme. The document was prepared by Uwe Tietze and Susan Singh-Renton.

## **EXECUTIVE SUMMARY**

This report proposes a Strategic Action Programme (SAP) for achieving effective governance and management of flyingfish fisheries in the Wider Caribbean Region (WCR). A Transboundary Diagnostic Analysis (TDA) carried out by the CLME identified three priority transboundary problems that affect the CLME, i.e. unsustainable exploitation of fish and other living resources, the degradation and modification of natural habitat and pollution and contamination. Case studies carried out by the CRFM strengthened the technical-scientific information and knowledge base, identified gaps and examined options for promoting precautionary and ecosystem approaches to fisheries governance for the Eastern Caribbean flyingfish fishery.

Stakeholders were involved from the very beginning in the preparation, conduct and review of these studies. The governance reports, which summarize the results and findings of the studies and included consideration of information generated by supporting technical activities, were reviewed and validated by stakeholders, including stakeholders from the private fishery sector, during a validation workshop, held in May 2012. The SAP presented in this report further takes into consideration the outcome of the First Meeting of the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean, held in Kingstown, St. Vincent and the Grenadines (CRFM, 2012d), which prepared an update of the 2008 sub-regional Fisheries Management Plan for Flyingfish.

The overall vision of the SAP for flyingfish fisheries in the Wider Caribbean Region (WCR) encompasses healthy marine ecosystems that are adequately valued and protected through robust, integrative and inclusive governance arrangements at local, national, sub-regional and regional levels that effectively enable adaptive management, which maximizes, in a sustainable manner, the provision of goods and services in support of enhanced livelihoods and human well-being.

The overarching Ecosystem Quality Objective (EcoQO) encompasses healthy pelagic ecosystems including the conservation, protection and/or restoration of the fish stocks and biodiversity of the pelagic ecosystem. The overarching Societal Benefit Objective (SBO) encompasses the provision of goods and services by the ecosystems so that it maximizes the systems contributions to societal wellbeing and development needs in the Wider Caribbean Region including the preservation of aesthetic, traditional, health and scientific values of the ecosystem.

The objectives of the SAP proposed in this report are fully compatible with the management goals, objectives and indicators proposed in the 2012 Update of the Sub-regional Management Plan for Flyingfish Fisheries in the Eastern Caribbean, shown in table 1 of this report. The SAP identifies broad interventions, strategies, targets, indicators, investments, timeframes, costs and responsibilities that are needed for achieving effective governance and management of flyingfish fisheries in the WCR (table 6).

Based on the findings of the case studies, these broad interventions are further sub-divided into specific interventions and reforms to be implemented for effective governance and management of the flyingfish fisheries using precautionary and ecosystem-based approaches (chapter 9.2). For each of the specific interventions, priority, time frames, costs, as well as the party/stakeholder responsible for implementation are identified (table 7).

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## LIST OF ACRONYMS AND ABBREVIATIONS

ALG	-	Action Learning Groups
CANARI	-	Caribbean Natural Resources Institute
CARICOM	-	Caribbean Community
CARIFIS	-	Caribbean Fisheries Information System
CCCFP	-	Caribbean Community Common Fisheries Policy
CCRF	-	Code of Conduct for Responsible Fisheries
CERMES	-	Centre for Resource Management and Environmental Studies
CFP	-	Common Fisheries Policy
CLME	-	Caribbean Large Marine Ecosystem
CNFO	-	Caribbean Network of National Fisherfolk Organizations
CPUE	-	Catch Per Unit of Effort
CRFM	-	Caribbean Regional Fisheries Mechanism
CS	-	Continental Shelf
CZ	-	Contiguous Zone
EAF	-	Ecosystem Approach to Fisheries
ECFFP	-	Eastern Caribbean Flyingfish Project
EcoQO	-	Ecosystem Quality Objective
EEZ	-	Exclusive Economic Zone
EU	-	European Union
FAC	-	Fishery Advisory Committee
FAO	-	Food and Agriculture Organization of the United Nations
HACCP	-	Hazard Analysis and Critical Control Point
ICZM	-	Integrated Coastal Zone Management
IMS	-	Information Management System
IMS-REMP	-	Information Management System - Regional Environmental Monitoring Programme
IOC	-	Intergovernmental Oceanographic Commission
IOCARIBE	-	Intergovernmental Oceanographic Commission Sub-Commission for the Caribbean and Adjacent Regions
IUU	-	Illegal, Unregulated and Unreported fishing
LRS	-	Licensing and Registration System
MBDA	-	Multi- or Bilateral Development Agency
MCS	-	Monitoring, Control and Surveillance
MDGs	-	Millennium Development Goals
MSY	-	Maximum Sustainable Yield
NFO	-	National Fisherfolk Organization
NGA	-	National Government Authorities
NICs	-	National Inter-sectoral Committees
N.M.	-	Nautical Mile
NS	-	National Stakeholders
OECS	-	Organization of Eastern Caribbean States
OSPESCA	-	Organization for Fisheries and Aquaculture of the Central American Isthmus
REMP	-	Regional Environmental Monitoring Programme
RFMO	-	Regional Fisheries Management Organization
RFO	-	Regional Fisheries Organization
RS	-	Regional Stakeholders
RTI	-	Research/Training Institution
SAP	-	Strategic Action Programme
SBO	-	Societal Benefit Objective



SCPWG	-	Small Coastal Pelagic Fish Resource Working Group
SPAW	-	Specially Protected Areas and Wildlife
SPS	-	Sanitary and Phyto-sanitary
TDA	-	Transboundary Diagnostic Analysis
TIP	-	Trip Interview Programme
TS	-	Territorial Sea
UNDP	-	United Nations Development Programme
UNESCO	-	United Nations Educational, Scientific, Educational and Cultural Organization
UNOPS	-	United Nations Office for Project Services
UWI	-	University of the West Indies
WCR	-	Wider Caribbean Region
WECAFC	-	Western Central Atlantic Fishery Commission

## 1. INTRODUCTION AND BACKGROUND

The Strategic Action Programme on Governance of Flyingfish in the Caribbean Large Marine Ecosystem (CLME) described in this report draws on a case study, which was carried out by the CRFM for the Caribbean Large Marine Ecosystem (CLME) Project “*Sustainable Management of the shared Living Marine Resources of the Caribbean Large Marine Ecosystem and Adjacent Regions*”. The aim of the CLME Project is to assist Caribbean countries to improve the management of their shared living marine resources through an ecosystem based approach. The CLME Project began on 1 May 2009 and will end on 30 April 2013.

A Transboundary Diagnostic Analysis (TDA) carried out by the CLME identified three priority transboundary problems that affect the CLME, i.e. unsustainable exploitation of fish and other living resources, the degradation and modification of natural habitat and pollution and contamination. The TDA serves as the scientific basis for the development of an agreed programme of interventions for the CLME, otherwise known as Strategic Action Programme (SAP). The overall SAP, which is under preparation and to which the SAP for flyingfish fisheries contributes, will have a shared vision for the CLME and adjacent regions. Agreements will be made regarding the priority interventions, reforms and investments required.

The case study carried out by the CRFM aimed at strengthening the technical-scientific information and knowledge base and at examining options for promoting an ecosystem approach to fisheries governance for the flyingfish fisheries in the CLME. The case study produced two reports that examined the governance aspects, i.e. a review of existing policy, legal and institutional arrangements for the governance and management of the flyingfish fisheries and a stakeholder analysis. Stakeholders were involved from the very beginning in the preparation, conduct and review of the study as well as in the elaboration of the Case Study programme through the establishment of a Steering Committee for the Eastern Caribbean Flyingfish Fishery Consultancy, which held its first meeting in February 2011 (CRFM, 2011a).

The SAP presented in this report also draws on the draft CRFM / CLME Eastern Caribbean Flyingfish Fishery Case Study – Governance Assessment conducted by the Centre for Resource Management and Environmental Studies (CERMES) of the University of the West Indies (UWI).

The governance reports, which summarize the results and findings of the study, were reviewed and validated by stakeholders, including stakeholders from the fishery sector, during a validation workshop, held in May 2012, which has been published as CRFM Technical and Advisory Documents.

The SAP further takes into consideration the outcome of First Meeting of the CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean, held in Kingstown, St. Vincent and the Grenadines (CRFM, 2012d). The meeting prepared an update of the 2008 sub-regional Fisheries Management Plan for Flyingfish which proposes a two year moratorium/freeze of fishing capacity in the sub-region. A draft management resolution was also drafted. The plan and proposed management resolution will be reviewed by national consultations to be held from October to December 2012. Following the national reviews, the updated plan will be presented for adoption by the Caribbean Fisheries Forum and later by the CRFM Ministerial Sub-committee on Flyingfish and also by the WECAF Commission.

The SAP dealing with the governance of the flyingfish resources synthesizes information from the various activities undertaken under the flyingfish case study and

- attempts to incorporate the views of all stakeholders;

- focuses on the transboundary issues and concerns without minimizing the importance of national issues and priorities;
- identifies policy, legal and institutional deficiencies and restrictions that may hinder effective transboundary management and governance of the fishery and its supporting ecosystem;
- recommends reforms including the identification of a sub-regional decision making forum and other policy, legal and institutional reforms and investments needed at local, national and sub-regional / regional levels for effective governance and management of the flyingfish fishery following an ecosystem approach to fisheries management.

The SAP presented in this document further suggests a phased approach to the implementation of proposed interventions, depending on the suggested priority of each intervention, which stakeholders might want to reassess, and on the timeframe envisaged for implementation.

The proposed interventions furthermore address all stages of the EAF management cycle, i.e. generation of data and information, analysis of data and information and generation of management advice, decision-making, implementation, review and evaluation as well as adjustment of management plans to the findings of reviews and evaluations.

Investment costs have been assessed for each proposed specific intervention in terms of high, medium and low. In order to obtain realistic quantitative estimates it is suggested to consult in a participatory manner with the stakeholders, which have been identified as implementers of the proposed intervention.

## **2. METHODOLOGY**

### **2.1 Basic concepts and definitions**

In the following, some basic concepts and definitions, which form an integral part of this SAP, are highlighted.

#### *Governance<sup>1</sup>*

In this SAP, as in other SAPs of the CLME Project, governance is defined as the mechanisms and processes of how an organization controls its actions. Governance describes the mechanisms an organization uses to ensure that its constituents follow its established processes and policies. It is the primary means of maintaining oversight and accountability in a loose organizational structure. A proper governance strategy includes systems to monitor and record what is going on, takes steps to ensure compliance with agreed policies, and provides for corrective action in cases where the rules have been ignored or misconstrued.

#### *Strategic direction, objectives, priorities*

Strategic direction is defined as a course of action that leads to the achievement of the goals of an organization's strategy. Strategic objectives are broadly defined objectives that an organization must achieve to make its strategy succeed.

Strategic priorities are ranked by their importance in achieving the strategic goals.

#### *Fisheries Management*

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<sup>1</sup> A comprehensive overview of governance issues in the CLME is provided by Fanning *et al.* 2011, pp. 257 – 320.

According to the FAO Technical Guidelines for Responsible Fisheries on fisheries management (FAO, 1997, p. 82), fisheries management is defined as “the integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives.”

#### Ecosystem approach to fisheries management

The ecosystem approach to fisheries (EAF) recognizes the need for fisheries management to consider the impact of the ecosystem and other users of the ecosystem on fisheries as well as the broader impact of fisheries on the ecosystem as a whole (FAO, 2003). The EAF strives to balance various societal objectives by taking into account both existing knowledge as well as uncertainties about biotic, abiotic and human components of ecosystems. The EAF also strives to take into consideration the interactions between these components by applying an integrated approach to fisheries within a meaningful ecological context.

The FAO Technical Guidelines for Responsible Fisheries on fisheries management (FAO, 1997, p. 59) state further that the utilization of living aquatic resources and the management of this utilization should be seen as partnerships between the management authority and the interest groups. The objectives should reflect the reasonable desires of the interest groups, within the constraints imposed by the biological and ecological limitations of the resources and the overriding objectives of national planning.

#### Precautionary approach to fisheries management<sup>2</sup>

The precautionary approach adopted recognizes that:

- all fishing activities have significant impacts;
- fisheries impacts are not negligible unless proven otherwise;
- the complex and changing fishery system will never be perfectly understood;
- scientific advice for management is therefore always affected by uncertainty;
- management decision processes and sector's compliance add their own uncertainties;
- impacts of fisheries on the system are therefore difficult to predict accurately; and
- consequences of management errors may be only slowly reversible.

As a consequence, and recognising that the conduct of fisheries requires that decisions are still made with incomplete knowledge, the approach requires *inter alia* that:

- a level of precaution commensurate to risk be applied at all times to all fisheries;
- it be applied systematically, i.e. in research, management and fishing operations;
- potentially irreversible changes be avoided (to maintain options for future generations);
- undesirable outcomes be anticipated and measures be taken to reduce their likelihood;
- corrective measures be applied immediately and be effective within an acceptable time;
- priority be given to conserving the productive capacity of the resource;
- precautionary limits be put on fishing capacity on highly uncertain resources;
- all fishing activities be subjected to prior authorisation and periodic review;
- the burden of proof be appropriately (realistically) placed;
- standards of proof commensurate with the potential risk to the resource be established; and
- the approach is formalized in a comprehensive legal and institutional framework.

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<sup>2</sup> See <http://www.fao.org/fishery/topic/13302/en>

## Poverty and vulnerability

As far as the overriding objectives of national planning are concerned, and this is particularly true for developing countries, the fight for eradication of poverty and hunger and the achievement of the Millennium Development Goals (MDGs) figure prominently among the objectives of national planning and should have a central place among management objectives of fisheries administrations. Poverty and vulnerability is a complex concept and process characterized by low incomes, poor health, low literacy levels, under-nutrition and inadequate housing and living conditions. Governments have committed themselves to eradicate poverty.

The Regional Policy and Planning Workshop on the FAO Code of Conduct for Responsible Fisheries (CCRF) in the Caribbean: Achieving Improved Fisheries Management and Utilization in the wider Caribbean Region, held at the University of the West Indies, Cave Hill Campus, Barbados, from 6-9 December 2011 (FAO, 2012) recommended that efforts be increased by fisheries authorities and other stakeholders to mainstream fisheries into national poverty reduction and development plans, strategies and programmes.

A recently completed diagnostic study to determine poverty and vulnerability levels in CARICOM fishing communities (CRFM, 2012a) covered four of the countries included in the case study on flyingfish fisheries i.e. Barbados, Grenada, Saint Vincent and the Grenadines and Trinidad and Tobago. In the case of Grenada and Saint Vincent and the Grenadines, more than 5 percent of the households in the fisheries/aquaculture sectors were classified as being poor; 6.61 and 5.41 percent, respectively (CRFM, 2012a, p. xvi). In both countries, these households were involved in capture fisheries. For Trinidad and Tobago, the percentage of fisheries households living in poverty was 1.32 percent. Poverty in fisheries households was not an issue in Barbados.

Compared to poverty, vulnerability was found to be a much more important issue in all four countries covered by the study. Grenada topped the list with 25.62 percent of fisheries households being vulnerable, followed by Trinidad and Tobago with 15.23 percent, Saint Vincent and the Grenadines with 10.81 percent and Barbados with 7.37 percent. The main components of poverty and vulnerability were lack of access to services, poor quality of dwellings, semi-illiteracy and low levels of education as well as low economic capacity and productivity. Large household and family sizes as well as high illiteracy and semi-illiteracy levels figured prominently among the demographic characteristics of poor and vulnerable households. Another characteristic, which poor and vulnerable fisheries households had in common, was that they depended more strongly on fisheries for their income as compared to other households.

## **2.2 Methods employed by case study**

The methods employed by the case study and for the development of the SAP are highlighted below. The case study builds heavily on the work carried out by CRFM and WECAFC bodies such as the CRFM Annual Scientific Meetings, the work of the CRFM Small Coastal Pelagics Fish Resource Working Group (SCPWG) and the work of the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean.

### 2.2.1 Review of existing policy, legal and institutional arrangements for governance and management of flyingfish fisheries in the CLME

Consultations were held with various government departments and regional / sub-regional organisations to obtain information on existing policies, laws, regulations and other fishery-related agreements and

institutional arrangements for fisheries governance and management during a 12-day mission by two consultants to the sub-region.

The mission included the participation in the Regional Policy and Planning Workshop on the FAO Code of Conduct for Responsible Fisheries (CCRF) in the Caribbean: Achieving Improved Fisheries Management and Utilization in the wider Caribbean Region. The workshop was held at the University of the West Indies, Cave Hill Campus, Barbados, from 6 - 9 December 2011. It was co-organized by FAO, the Ministry of Agriculture, Food, Fisheries and Water Resource Management of Barbados, the Centre for Resource Management and Environmental Studies (CERMES) and the Western Central Atlantic Fishery Commission (WECAFC). Many of the topics discussed were relevant to the assignment of the consultants, and the workshop offered an opportunity to interview representatives from Barbados, Dominica and regional organisations and to consult with participants regarding the terms of reference of the assignment.

Following the participation in the regional workshop, the consultants visited Saint Lucia, Saint Vincent and the Grenadines, Grenada and Trinidad and Tobago. Prior to and following the mission, various publications and documents were reviewed. The reports, which summarize the results and findings of the study, were reviewed and validated by stakeholders, including a large number of stakeholders from the private fishery sector, during a validation workshop, held in Grenada in May 2012, which is under publication as CRFM Technical and Advisory Document.

### 2.2.2 Stakeholder Identification and Analysis

The Caribbean Natural Resources Institute (CANARI) was contracted to conduct a stakeholder analysis. Desk reviews of literature and information on stakeholders as well as participatory methods were employed in the identification and analysis of stakeholders. The desk study was used to identify primary, secondary and key stakeholders at the international, regional and national level. Stakeholders were classified as intergovernmental, government organizations, fisherfolk organizations, academic and research organizations, private sector and non-governmental organizations.

Based on the findings of the desk study, an empirical survey was conducted. Survey forms were e-mailed to regional and country level stakeholders with follow-up telephone calls. The survey was used as a guide to structure interviews with stakeholders, who could not attend focus group discussions and regional stakeholders based in countries that were not part of the case study. Altogether, 196 persons were contacted for the study as well as 138 organizations.

In addition to desk study and e-mail survey, in-country focus group discussions were organized. The Fisheries Divisions in four of the five countries studied, i.e. Barbados, Grenada, Martinique, St. Vincent and the Grenadines invited 10 organizations to participate in the focus group discussions. Facilitated sessions were conducted to identify primary and secondary stakeholders in the fishery of each country and the scope of involvement, i.e. international, regional or national. The capacity of stakeholders was assessed as well as their willingness and their level of influence in governance and management of the fishery. Challenges, constraints and opportunities for involvement in governance were also discussed (CRFM, 2012b).

The findings of the stakeholder identification and analysis were validated by stakeholders, including a large number of stakeholders from the private fishery sector, during a validation workshop, held in Grenada in May 2012, which is under publication as CRFM Technical and Advisory Document.

### 2.2.3 SAP development

The development of the SAP for flyingfish fisheries in the WCR in this report is done in five steps. It begins with the definition of an overall vision (step 1). This is followed by the identification of an overarching Ecosystem Quality Objective (EcoQO) and an overarching Societal Benefit Objective (SBO) (step 2). The objectives of the SAP proposed in this report are fully compatible with the management goals, objectives and indicators proposed in the 2012 Update of the Sub-regional Management Plan for Flyingfish Fisheries in the Eastern Caribbean, shown in Table 1 of this report.

Based on vision and overarching objectives, the SAP then identifies broad interventions, strategies, targets, indicators, investments, timeframes, costs and responsibilities that are needed for achieving effective governance and management of flyingfish fisheries in the WCR (step 3). Based on the findings of the case studies, these broad interventions are further sub-divided into specific interventions and reforms to be implemented for effective governance and management of the flyingfish fisheries using an ecosystem-based approach (step 4). For each of the specific interventions, priority, time frame, cost as well as the party / stakeholder responsible for implementation are identified (step 5).

## **3. INTEGRATION AND MAINSTREAMING**

### **3.1 Mainstreaming**

The work carried out through the case study and the SAP development, while having been informed by the work carried out by CRFM, WECAFC and others, is being integrated and mainstreamed into policy making in the CLME. Examples are the establishment of a CRFM Ministerial Sub-committee on Flyingfish and the establishment of a joint CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean. The CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean, at its first meeting, held from 18 - 19 June 2012 in Kingstown, St. Vincent and the Grenadines, prepared an update of the 2008 sub-regional Fisheries Management Plan for Flyingfish, which proposes, *inter alia*, a two year moratorium/freeze of fishing capacity in the sub-region. The plan will strengthen sub-regional management of flyingfish fisheries through improved cooperation in data collection, analysis and sharing, Licensing and Registration System (LRS), Monitoring, Control and Surveillance (MCS) and other means. The development of the sub-regional management plan for Eastern Caribbean flyingfish is already making progress towards implementation of the CCCFP. The development and implementation of this sub-regional fisheries management plan is among the agreed actions and measures to be taken by the members of the Western Central Atlantic Fishery Commission (WECAFC) under its 2012 “Resolution on Strengthening the Implementation of International Fisheries Instruments” and under its endorsed Programme of Work. Moreover, the plan addresses joint actions proposed in the 2010 Castries (St. Lucia) Declaration on Illegal, Unreported and Unregulated Fishing of the CRFM. The plan will be reviewed by national consultations to be held during October to December 2012. Following the national reviews, the updated plan will be presented for endorsement by the Caribbean Fisheries Forum and later by the CRFM Ministerial Sub-committee on Flyingfish and also by the WECAFC Commission.

Other proofs of mainstreaming of the work undertaken under the CLME Project into sub-regional and regional policy making are the adoption, by the CRFM Ministerial Council, of a Declaration on Illegal, Unreported and Unregulated (IUU) Fishing (the Castries Declaration) in 2010. Also, in 2011 the CRFM Ministerial Council unanimously adopted a Common Fisheries Policy for CARICOM States (CCCFP), which makes provisions for CARICOM-level coordination of holistic fisheries governance activities that incorporate the precautionary approach and the ecosystem approach.

### **3.2 Other cooperation extended by CRFM to CLME Project activities**

In addition to two case studies (flyingfish fisheries and large pelagic fisheries) executed under the auspices of the CRFM, CRFM has actively contributed to, and assisted with CLME Project activities undertaken by other project partners. For instance, FAO requested and obtained the constant assistance of the CRFM Secretariat in provision of technical support throughout the delivery of its Case Study to address the continental shelf fisheries and related ecosystem. CRFM and OSPESCA cooperated in convening a joint High Level Ministerial Meeting and in developing a Joint Action Plan to address a broader and formal regional management approach for the spiny lobster fishery that has been the subject of a CLME pilot project led by OSPESCA. CRFM has, over the period of the project, facilitated requests by UWI CERMES to accommodate activities and discussions for development of the Regional Governance Framework component.

Also, CRFM has prepared a dataset of information on CRFM publications to date for input into the IMS-REMP project component. The Information Management System (IMS), together with the Regional Environmental Monitoring Programme (REMP), aims to provide, among other information, references and links to sources of reliable, up-to-date data and information on ecosystems, environment and related issues for decision making and governance.

These complementary components on data and information were developed and implemented under the responsibility of the Intergovernmental Oceanographic Commission's Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE). The tools are an IOCARIBE contribution to the Caribbean Large Marine Ecosystem project (CLME), which aims to strengthen the management of the shared living marine resources of the Wider Caribbean.

## **4. VISION FOR THE FUTURE AND GUIDING OBJECTIVES**

The overall vision for the future of the Wider Caribbean Region (WCR) encompasses healthy marine ecosystems that are adequately valued and protected through robust, integrative and inclusive governance arrangements at local, national, sub-regional and regional levels that effectively enable adaptive management, which maximizes, in a sustainable manner, the provision of goods and services in support of enhanced livelihoods and human well-being.

The overarching Ecosystem Quality Objective (EcoQO) encompasses healthy pelagic ecosystems including the conservation, protection and / or restoration of the fish stocks and biodiversity of the pelagic ecosystem. The objective also aims to safeguard the habitats and community structure of the ecosystems from fishery impacts, direct and indirect physical impacts and pollution impacts that diminish the contributions of these systems to enhanced livelihoods and human well-being.

The overarching Societal Benefit Objective (SBO) encompasses the provision of goods and services by the ecosystems so that it maximizes the system's contributions to societal well-being and development needs in the Wider Caribbean Region including the preservation of aesthetic, traditional, health and scientific values of the ecosystem. The SBO further envisages contributions from the shared living marine resources to meet the region's food and nutritional and socio-economic development needs. These needs include the alleviation of poverty and reduction of vulnerability of small-scale fishers, their communities and special target groups such as the elderly, women and children in fishing communities.

In terms of governance, the objective encompasses the establishment and implementation of co-ordinated and cost-effective governance arrangements for safe guarding the environmental health of the flyingfish fisheries ecosystem. It further includes the establishment and implementation of coordinated and cost-



effective fisheries governance and management arrangements that are broadly supported, well informed, equipped to implement the ecosystem approach and allow for the equitable participation of all stakeholders.

The objectives and strategic directions for the pelagic fisheries ecosystem for the CLME SAP are shown in table 1.

**Table 1: Objectives and strategic directions for the pelagic fisheries ecosystem for the CLME SAP**

	<b>UNSUSTAINABLE EXPLOITATION</b>	<b>HABITAT DEGRADATION AND COMMUNITY MODIFICATION</b>	<b>POLLUTION</b>
EcoQOs  Conservation, and restoration where necessary, of the health of the pelagic ecosystem within the WCR.	Protection, and restoration where necessary, of the health and natural balance of exploited fish populations occurring within the marine ecosystem, adopting a precautionary management strategy, as needed.	Conservation, and restoration where necessary, of the natural structure and function of the ecosystem, biological diversity, and ecosystem resilience, adopting a precautionary management strategy, as needed.	Conservation, and restoration where necessary, of the health of the aquatic environment, with emphasis on guaranteeing agreed standards of water and habitat quality.
SBOs  Provision of goods and services by the pelagic ecosystem such that it contributes to societal development needs of the WCR, and to preservation of the associated aesthetic, traditional, health, educational and scientific values.	Sustainable and optimal use of living marine resources, for meeting the region’s food and nutrition security needs, and other social and economic benefits associated with such exploitation.	Responsible and sustainable management of pelagic ecosystem goods and services, for fulfilling social and economic development needs, while also preserving the full aesthetic, traditional, cultural, health, educational and scientific values of such goods and services.	Fulfilment of social and economic development objectives, through responsible management of environmental health, necessary for preventing risks to human health and well-being.
Strategic directions  Establishment and implementation of cooperative and cost-effective governance and fisheries management arrangements that are fully supported, well informed and equipped to implement ecosystem based management	Establishment and implementation of cooperative and cost-effective governance and fisheries management arrangements that are fully supported, well informed, and equipped to implement the ecosystem approach to fisheries management	Establishment and implementation of cooperative and cost-effective arrangements for fully supported and well-informed sustainable and diverse social and economic development and management planning and decision-making	Establishment and implementation of cooperative and cost-effective arrangements for fully supported and well-informed management of environmental health, and for sustaining its contribution to human health and well-being

#### 4.1 Objectives, indicators and reference points of proposed 2012 update of sub-regional flyingfish fisheries management plan

The overall governance objectives have been further refined in terms of sub-regional EAF flyingfish fisheries management (table 2). The plan adopts a precautionary approach to fisheries management. Taking into consideration shortcomings in data collection and analysis and with the ultimate view to safeguard the socio-economic well-being of the flyingfish industry in the sub-region and the health of the ecosystem that sustains the flyingfish industry, the plan proposes, among other things, the establishment of an authorized entry (license / permit) system for flyingfish fisheries and the precautionary introduction of a 2-year sub-regional freeze on expansion off flyingfish fishing capacity.

The proposed 2012 update of the 2008 sub-regional flyingfish fisheries management plan for the Eastern Caribbean contains general and operational objectives, which are summarized, together with indicators and reference points, in CRFM, 2012d, p. 73 – 75.

Management objectives are sub-divided into broad management goals, more specific general objectives and operational objectives. Operational objectives are associated with indicators and reference points. Table 2 (based on table 5 of CRFM, 2012d, pp. 73 – 75) shows the hierarchy of management goals, general and operational objectives proposed in the 2012 update of the sub-regional management plan for flyingfish fisheries in the Eastern Caribbean.

**Table 2: Management Goals, Objectives and Indicators proposed in the 2012 Update of the Sub-regional Management Plan for Flyingfish Fisheries in the Eastern Caribbean**

Management goal / strategic objective	General objective	Operational objective	Indicators
<b>1.Sustained fishery resource - biological</b>	1.1 Sustained resource Ensuring that there are flyingfish available for future generations. Preventing overfishing to maintain a healthy stock	- Current average catch rates sustained over the long-term and throughout the area of distribution - Stock biomass is maintained at or above MSY levels	- National CPUEs (spatial) - Total national landings
	1.2 Accurate information. Ensuring that an effective data collection system is in place to provide accurate information and knowledge about the state of the fishery	- National data collection improved and gaps filled	- Sampling coverage - Sampling design
	1.3 Effective management. Ensuring that there is an effective system for adaptive and responsive management and enforcement as needed.	- Establish a harmonized sub-regional data base - Timely submission of data and information to CRFM - Establish authorized access to fishery - Establish precautionary measures as required - Ensure ability to make	- Sub-regional data base operational - Annual submission of data - Licence / permit system specifically for flyingfish - Variety of indicators as required - Legislation and regulations in place - Compliance levels

		and enforce management decisions	<ul style="list-style-type: none"> <li>- Ensure ability to collaborate effectively with stakeholders and other countries and organizations both vertically and horizontally</li> <li>- Adaptation to external drivers / perturbations</li> </ul>
<b>2. Optimal use of fishery for long-term benefit - socio-economic</b>	2.1 High social benefits and economic / financial returns Optimal social, economic and financial benefits for all involved in the fishery	- Optimize social, economic and financial benefits derived from fishery	<ul style="list-style-type: none"> <li>- Employment level</li> <li>- Income level</li> <li>- Return on investment</li> <li>- Credit access</li> </ul>
	2.2 Affordable food source	Ensuring that flying fish remains an affordable and available source of food for the future	<ul style="list-style-type: none"> <li>- Per capita consumption</li> <li>- Percentage of population consuming flyingfish</li> <li>- Market price of flyingfish</li> <li>- Relative market price</li> </ul>
	2.3 Fair access to fishing grounds	<ul style="list-style-type: none"> <li>- Ensure fair access to fishing grounds</li> <li>- Minimize conflict/competition with other resource sectors/users.</li> </ul>	<ul style="list-style-type: none"> <li>- Access indicators (e.g. number of vessels, fishers, licenses, permits)</li> <li>- Bi- and multilateral access agreements</li> <li>- Number of conflicts with other resource users</li> </ul>
	2.4 Optimal utilization/processing for domestic and export markets	<ul style="list-style-type: none"> <li>- Develop value addition for the post-harvest sector for domestic and export markets</li> <li>- Promote fish quality and safety for consumers</li> </ul>	<ul style="list-style-type: none"> <li>- Fish and fishery products related SPS standards (e.g. HACCP)</li> <li>- Value of post-harvest production</li> <li>- Export value</li> </ul>
<b>3. Sustained ecosystem health – ecological</b>	3.1 Healthy habitat Healthy habitat with minimal degradation and minimal impact from pollution or other negative effects	<ul style="list-style-type: none"> <li>- Maintain offshore pelagic habitat health</li> <li>- Minimize habitat degradation</li> </ul>	<ul style="list-style-type: none"> <li>- Water quality parameters</li> <li>- Marine debris / pollution occurrence</li> </ul>
	3.2 Healthy and resilient ecosystem with balanced trophic levels	<ul style="list-style-type: none"> <li>- Maintain aquatic biodiversity and healthy ecosystem</li> <li>- Adaptation to climate change and weather extremes</li> </ul>	<ul style="list-style-type: none"> <li>- Species composition of catches (including size)</li> <li>- Trophic levels (predator-prey composition)</li> <li>- Adaptation and vulnerability indicators</li> </ul>

## 5. PHYSICAL AND POLITICAL GEOGRAPHY

### 5.1 The Caribbean Large Marine Ecosystem (CLME)

The Caribbean Sea Large Marine Ecosystem (CLME)<sup>3</sup> is a semi-enclosed sea located between North and South America. It is bounded by Central America to the west.

It encompasses an area of 2,515,900 square kilometers and is the second largest sea in the world. The LME is comprised of four deep basins: the Venezuelan Basin in the east, the Colombian Basin in the west (from which it is separated by a ridge), the Cayman Trough in the northwest, and the Yucatan Basin in the north.

The Caribbean Sea LME is considered a Class III, low (<150 gC/m<sup>2</sup>-yr) productivity ecosystem, according to SeaWiFS global primary productivity estimates, although upwelling along the northern coast of Venezuela contributes to relatively high productivity in that area. Other factors contributing to the greater productivity of South America's northern coast are the nutrient input from rivers and estuaries.

As far as Governance is concerned, as many as 38 countries and dependencies border the Caribbean Sea Large Marine Ecosystem, and need to address the numerous transboundary issues existing in this LME. The Caribbean Large Marine Ecosystem (CLME) Project has been assisting Caribbean countries to improve the management of their shared living marine resources through an ecosystem based approach since 2009. The case study on review of existing policy, legal and institutional arrangements for governance and management of flyingfish fisheries in the CLME, including stakeholder identification and analysis, has focused on the eastern Caribbean sub-region.

**Map 1: Location of the Caribbean Large Marine Ecosystem. (Source: NOAA)**



<sup>3</sup> See [http://www.eoearth.org/article/Caribbean\\_Sea\\_large\\_marine\\_ecosystem?topic=49597](http://www.eoearth.org/article/Caribbean_Sea_large_marine_ecosystem?topic=49597). The Encyclopedia of Earth.

An overview of the physical and political geography of the region is provided in CRFM, 2012 d, pp. 51-53. Figure 1 of the report (p. 51) shows the major surface currents and river outflows affecting the wider Caribbean. Figure 2 of the report (p. 52) provides a synthesis of physical oceanographic characteristics of possible significance to fisheries in the eastern Caribbean.

The eastern Caribbean is characterized by a series of volcanic islands, which the Lesser Antilles islands arc including the States / islands of Grenada, St. Vincent and the Grenadines, St. Lucia, Martinique (department of France) and Dominica. These islands are characterized by high reliefs and limited shelf areas. To the east of the islands runs the 6000 m deep Tobago Trough. Barbados is located to the east of the trough. Trinidad and Tobago sit on a wide continental shelf associated with the South American mainland.

As far as the political geography is concerned, the eastern Caribbean sub-region, also referred to as Lesser Antilles, is one of the most compact multinational archipelagos in the world. With the exception of Martinique, which is a department of France, the other islands are all independent. All States have asserted jurisdiction over their territorial seas and exclusive economic zones and claimed a 12 nautical mile (n.m.) territorial sea, a 200 n.m. exclusive economic zone and a continental shelf. The information is shown in table 3 (Berry, D.S. & U. Tietze. 2012, p. 34).

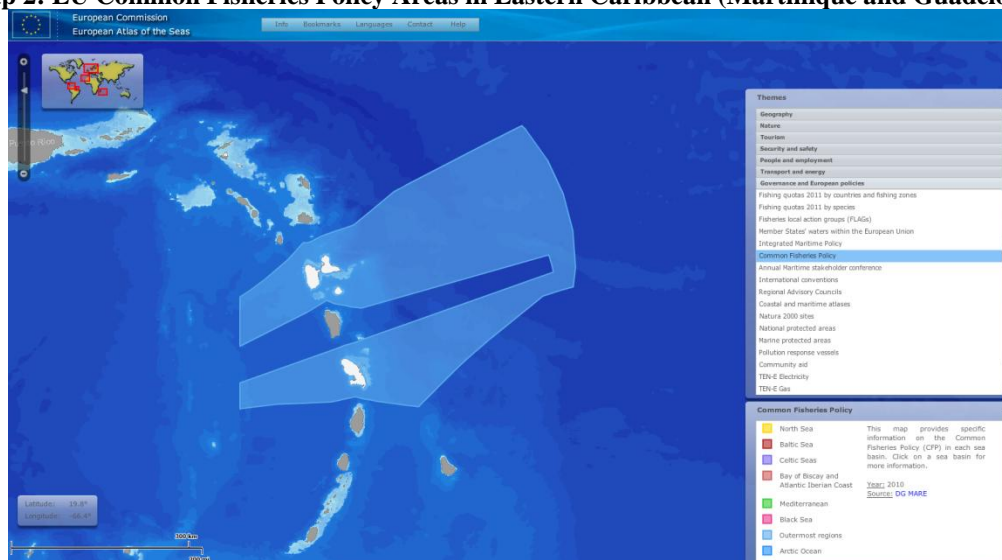
**Table 3: Limits of Territorial Sea, Contiguous Zone, Exclusive Economic Zone and Continental Shelf**

State	Limits of territorial sea (TS), contiguous zone (CZ), exclusive economic zone (EEZ) and continental shelf (CS), in nautical miles
Barbados	TS (12), EEZ (200), CS (to outer limit of continental margin or 200)
Dominica	TS (12) , CZ (24), EEZ (200)
Grenada	TS (12) , EEZ (200)
Martinique*	TS (12) , CZ (24), EEZ (200), CS (to outer limit of continental margin or 200)
St Lucia	TS (12) , CZ (24), EEZ (200), CS (to outer limit of continental margin or 200)
St. Vincent and the Grenadines	TS (12) , CZ (24), EEZ (200)
Trinidad and Tobago	TS (12) , CZ (24), EEZ (200), CS (to outer limit of continental margin or 200)
United States of America	TS (12), CZ (24), EEZ (200), CS (to outer limit of continental margin or 200)
Venezuela	TS (12), CZ (15), EEZ (200), CS (200 or to the limits of exploitation)

While each State is capable of asserting jurisdiction over fisheries within these areas of maritime jurisdiction, as permitted by national laws and international law, there is a lack of clearly delimited maritime boundaries between neighbouring States and almost all States have unresolved or disputed maritime boundaries.

Since Martinique is an overseas department of France, the European Union's Common Fisheries Policy applies to Martinique. Map 2 below shows the French EEZ areas around Martinique and Guadeloupe that are covered by the EU's CFP (Berry, D.S. & U. Tietze. 2012, p. 39).

**Map 2: EU Common Fisheries Policy Areas in Eastern Caribbean (Martinique and Guadeloupe)**



Membership in regional and international organizations with responsibility for fisheries management and development in the wider Caribbean region is shown in table 4.

**Table 4: Membership of Eastern Caribbean States in International and Regional Organizations**

Country / Organization	FAO	WECAFC	ACS	CARICOM	OECS	ICCAT
Barbados	√	√	√	√		√
Dominica	√	√	√	√	√	
Grenada	√	√	√	√	√	
Martinique (France)	√	√	√	√		√
St. Lucia	√	√	√	√	√	
St. Vincent & the Grenadines	√	√	√	√	√	√
Trinidad & Tobago	√	√	√	√		√

The membership of Eastern Caribbean States to international and regional conventions and treaties of relevance to fisheries as of June 2012 is shown in CRFM, 2012d, p. 62 (table 5).

**Table 5: Membership to International and Regional Conventions and Treaties of Relevance to Fisheries (as of June 2012)**

Country	UNCLOS	UN Fish Stocks Agreement	FAO Compliance Agreement	CITES	CBD	MARPOL IMO	Cartagena Convention	SPAW Protocol	FAO Port States Measures Agreement
Barbados	√	√	√	√	√	√	√	√	-
Dominica	√	-	-	√	√	√	√	-	-
Grenada	√	-	-	√	√	-	√	-	-
Martinique (France/EU)	√	√	√	√	√	√	√	√	-
St. Lucia	√	√	√	√	√	√	√	√	-
St. Vincent & the Grenadines	√	√	-	√	√	√	√	√	-
Trinidad & Tobago	√	√	-	√	√	√	√	√	-

Country profile data for the eastern Caribbean islands on geography, governance, demography and economy are provided in CRFM, 2012d, pp. 55, 56.

## **6. FISHERY AND ECOSYSTEM CHARACTERISTICS**

Flyingfish fisheries in the eastern Caribbean are part of the pelagic ecosystem, which provides ecosystem services, i.e. provisioning, regulating, cultural and supporting services. The provisioning services include the provision of fish for commercial, recreational and subsistence fishing; the generation of wave energy and the provision of a medium for transportation, i.e. shipping and pharmaceutical products as well as other services. The prominent regulatory service of the pelagic ecosystem is climate regulation. Cultural ecosystem services include recreational and tourism services and values, knowledge systems and educational values as well as spiritual and inspirational values. Supporting ecosystem services of the pelagic ecosystem include habitat for fish, eggs and larval stages of fish and shellfish, transport of eggs and larvae to feeding and recruitment grounds, provision of adult fish migratory pathways, as well as biodiversity functions related to sea turtles, sea birds and marine mammals (Berry, D.S & U. Tietze. 2012, p. 48).

Several flyingfish species have been recorded in the CLME region, but in the southern Lesser Antilles region, the fourwing flyingfish (*Hirundichthys affinis*) is considered the most commercially important small pelagic fish species. This small, epipelagic fish is believed to be an annual species (Oxenford *et al.*, 1993), and is an important constituent of the diet of many of the large pelagic fish species occurring in the same region (Hunte *et al.* 2007, Fanning & Oxenford. 2011). Studies have shown that the fourwing flyingfish is capable of moving throughout the Eastern Caribbean (Oxenford. 1994) and hence is a transboundary resource, but that the Eastern Caribbean Stock is distinct and hence can be managed separately (Gomes *et al.* 1999).

The fourwing flyingfish supports important small-scale fisheries in the region in terms of employment generation, food security and supply of bait for large pelagics fisheries. Like other small-scale fishers in the Caribbean, fishers involved in flyingfish fisheries often belong to the lower socio-economic strata of society and some live below the poverty lines of their respective countries. (Berry, D.S. & U. Tietze. 2012, p. 49). It is estimated that altogether 1700 boats from small to medium size are engaged in flyingfish fisheries in the Eastern Caribbean. Barbados alone accounts for about two thirds of the regional catch. The total catch of flyingfish in Barbados in 2009 was 2292 tonnes (Berry, D.S. & U. Tietze. 2012, p. 50).

The review of existing policy, legal and institutional arrangements for governance and management of flyingfish fisheries in the Caribbean Large Marine Ecosystem, carried out as part of the case study, provides an overview of the status of flyingfish fisheries in the Eastern Caribbean, of trophic interactions, food web and habitat as well as of impacts of land and sea based human activities (Berry, D.S. & U. Tietze. 2012, pp. 48 - 52). An overview of distribution, biology, species interaction, habitat and fishery characteristics can also be found in CRFM, 2012d, pp. 57 – 60 and pp. 64 - 71.

## **7. TRANSBOUNDARY FISHERIES GOVERNANCE ARRANGEMENTS**

The transboundary Diagnostic Analysis (TDA) carried out by the CLME identified three priority transboundary problems that affect the CLME, i.e. unsustainable exploitation of fish and other living resources, the degradation and modification of natural habitat and pollution and contamination. A holistic fisheries governance arrangement incorporating an ecosystem approach to fisheries (EAF) management of the fourwing flyingfish fisheries necessitates coordination of all fisheries management activities, from

local to sub-regional governance arrangements. Such coordination would guarantee the integration of multiple stakeholder objectives and compatibility of approaches across all the national jurisdictions relevant to the Eastern Caribbean stock.

Prior to the CLME project, there was no transboundary fisheries governance arrangement in place for the Eastern Caribbean fourwing flyingfish stock. Previous efforts at the regional level began in earnest in the 1980s. They have focused on coordination of statistics, biological and ecological research and stock assessment and have involved several organizations and institutes.

OECS, in collaboration with UWI, was responsible for overseeing the Eastern Caribbean Flyingfish Management Project, which examined the biology and ecology of the fourwing flyingfish (Oxenford *et al.* 1993). This project, together with subsequent genetic studies, showed that the Eastern Caribbean fourwing flyingfish stock was distinct from the stock occurring off Brazil and the Netherlands Antilles stock in the southern Caribbean (Oxenford. 1994, Gomes *et al.* 1999).

In the area of statistics and assessment at the sub-regional level, FAO's WECAFC established an Ad Hoc Working Group on Eastern Caribbean Flyingfish that held three meetings during the period 1999-2008. The Working Group was also responsible for coordinating the first regional fishery data analyses and stock assessments and for preparing the first regional management plan (FAO, 1999; FAO, 2002; FAO, 2010).

Similarly, CRFM's Small Pelagic Fish Resource Working Group (SCPWG), established in 2004, has been responsible for coordinating statistics and assessment of several small pelagic fish species including the fourwing flyingfish. Under the CLME project, CRFM's SCPWG developed technical products for promoting EAF to inform a holistic and transboundary fisheries governance arrangement for the Eastern Caribbean fourwing flyingfish. Towards this end, the CRFM SCPWG completed a bio-economic assessment of the fourwing flyingfish in 2011, and also undertook stakeholder consultations to identify the full range of management objectives, as well as management priorities, in order to determine how the supporting data systems should be improved (CRFM, 2011c; CRFM, 2012e).

The challenge for improved governance lies in the establishment of a regional fisheries management organization or arrangement with authority to make decisions on joint conservation and management measures, ensure compliance and resolve disputes that may arise between and among interested states.

At the level of management planning and decision-making, the CRFM, again consistent with its obligations to the CLME project, established a Ministerial Sub-Committee on Flyingfish, which is able to adopt regionally agreed management and conservation measures for the fourwing flyingfish (CRFM, 2011b). In addition to this initiative that is ongoing, WECAFC, in February, established a joint CRFM / WECAFC Working Group on Flyingfish in The Eastern Caribbean, for the specific task of finalizing the regional fisheries management plan for the fourwing flyingfish, and of monitoring the statistics required to support the implementation of the agreed plan (CRFM 2012 d).

## **8. POLICY, LEGAL AND INSTITUTIONAL DEFICIENCIES AND RESTRICTIONS THAT MAY HINDER EFFECTIVE TRANSBOUNDARY GOVERNANCE OF THE FLYINGFISH FISHERY**

Policy and legal deficiencies and restrictions have been identified by the case study that reviewed existing policy, legal and institutional arrangements for governance and management of flyingfish fisheries in the CLME (Berry, D.S. & U. Tietze. 2012, pp. 3 - 44). While States in the eastern Caribbean have asserted jurisdiction over fisheries within areas of their maritime jurisdiction, as permitted by national laws and



international law, there is a lack of clearly delimited maritime boundaries between neighbouring States and almost all States have unresolved or disputed maritime boundaries.

Gaps exist in relation to adherence in the region to major regional and international treaties related to ocean governance, fisheries and environmental law such as

- the United Nations Convention on the Law of the Sea,
- the Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks,
- the International Convention for the Conservation of Atlantic Tunas,
- the Agreement Establishing the Caribbean Regional Fisheries Mechanism,
- the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (FAO Compliance Agreement),
- the Common Fisheries Policy Agreement,
- the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing,
- the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention), and
- the Protocol concerning specially protected areas and wildlife to the Convention for the protection and development of the marine environment of the wider Caribbean region (the SPAW Protocol).

National fisheries laws and regulations are generally silent about ocean governance principles and best practices, as set out in international non-binding instruments such as the FAO Code of Conduct for Responsible Fisheries, its related Plans of Action and Technical Guidelines, and the Castries Declaration on Illegal, Unreported and Unregulated Fishing including principles such as using the best available scientific information, applying the precautionary and ecosystem based approaches to fisheries management, the principle of sustainable use, the participatory approach, and principles of good governance.

The same case study identified institutional and management deficiencies (Berry, D.S. & U. Tietze. 2012, pp. 52 – 63). As far as ecosystem considerations and the involvement of fishery industry and other stakeholders in the formulation, implementation, evaluation and revision/updating of fisheries management plans through Fishery Advisory Committees and other means is concerned, it was observed that this was done in the past on an ad hoc basis and not in a consistent manner.

Most existing national fisheries management plans and policies are of a more generic and general nature, some still in draft form and in the process and need of being revised and updated and do not contain any specific provisions for the management and conservation of flyingfish.

Present fisheries management plans and regulations also do not address the important issue of cooperation and linkages with other Government agencies, authorities and stakeholders to deal with the degradation of coastal and aquatic ecosystems that might negatively affect the reproduction and health of flyingfish and other fish and organisms which flyingfish depends on for food and reproduction.

Weaknesses in the national fisheries data collection system are of particular concern for flyingfish under an ecosystem management regime. This applies both to the type of data presently collected and to the methods of data collection, recording and analysis.

There is also a lack of economic and social information about the flyingfish fishery, which is needed to attract investments in sustainable harvesting and value addition of flying fish as well as a lack of information needed to understand the health of the marine ecosystem, which supports the flyingfish

fishery. At the sub-regional level, there is a complete lack of sub-regional data bases, which is a major obstacle for sub-regional management efforts.

As far as the involvement of stakeholders in flyingfish fisheries is concerned, the case study found that most stakeholders at the regional level had high capacity for and were willing to participate in governance and management of the fishery. Levels of influence were found to be high for direct users and participants in the fishery and for decision-makers. Constraints at the regional level regarding stakeholder participation were identified as a lack of clear and consistent messages about governance, EAF and participatory processes. Opportunities for more meaningful stakeholder participation were seen in the emergence of a CCCFP and the ongoing updating of the 2008 sub-regional flyingfish fishery management plan.

At the national level, the case study found that direct users of the resource as well as decision makers had a high level of influence and willingness to participate in governance and management but only low capacities to do so. Some indirect users and secondary stakeholders did not even consider themselves stakeholders and were unwilling to participate in any governance arrangement.

Constraints at the national level included low representation in stakeholder organizations, inefficient communication within and among organizations, inadequate understanding of the roles and responsibilities of stakeholders in the fishery and inadequate resources for effective participation in governance. Opportunities at the national level for a more effective participation were identified as an increasing awareness of the need for sustainable management and conservation of natural resources among stakeholders and the existence of “champions” or stewards within organizations who can act as catalysts for change.

## **9. REFORMS AND STRATEGIES TO BE TAKEN FOR EFFECTIVE GOVERNANCE AND MANAGEMENT OF THE FLYINGFISH FISHERIES USING AN ECOSYSTEM-BASED APPROACH**

### **9.1 Transboundary fisheries governance considerations in the CLME sub-region for achieving EAF management**

Options for holistic and transboundary governance of Eastern Caribbean flyingfish, with emphasis on achieving EAF management, were explored and developed by the CRFM under the CLME project (CRFM, 2011a). Like the large pelagic fisheries, essentially, the major challenge for transboundary fisheries governance of the fourwing flyingfish at the CLME sub-regional level is that there is no existing RFMO or arrangement that includes this species in its mandate.

It is possible that in the future, the inter-organizational partnership arrangement proposed for the large pelagic fisheries in the previous section, could address the management issues for the fourwing flyingfish and other small, pelagic fish species through application of the ecosystem approach to the extent that they are associated with or dependent upon the fisheries for large pelagic species occurring in the same ecosystem.

In the meantime, the governance and management processes should be actively initiated and actively pursued from within the sub-region itself (table 6), and this has already begun with the work of UWI, OECS, WECAFC, CRFM and the individual States themselves. Building on the progress made, the first proposed intervention is the establishment of a sub-regional governance arrangement, in which the CRFM and its Ministerial Sub-Committee on Flyingfish play a central role (table 6). Through this arrangement, the CRFM and its Ministerial Sub-Committee would take the lead in coordination EAF management

activities, including establishing a formal arrangement with France for cooperation in management of the fourwing flyingfish. The CRFM and its Ministerial Council would also be responsible for keeping other regional organizations such as WECAFC informed of the progress of its work, and establishing partnerships, as required, for the purpose of ensuring complementary EAF management approaches throughout the CLME region.

As for large pelagic fisheries, other key basic challenges exist at the national level for those CLME countries with flyingfish fisheries. Given that it is also a transboundary resource, the same national-level interventions and justifications are proposed, as for large pelagic fisheries. A list of these interventions are simply reiterated here for ease of reference, as the justifications were provided in the companion report on large pelagic fisheries (Tietze and Singh-Renton. 2012): (i) to increase the level of commitment by individual countries to legal sub-regional and international fisheries and environmental instruments; (ii) to complete national maritime boundary delimitation negotiations; (iii) to strengthen and make functional national EAF governance and management arrangements, including updating / activating policy and legal instruments and empowerment of national inter-sectoral committees advocated by the CLME project.

Also, as noted for large pelagic fisheries, strong data, information and knowledge exchange systems are also needed to guarantee well-informed EAF management planning and decision-making at both the national and regional levels. Hence, progress made and lessons learned from the IMS-REMP component of the CLME project should be used to inform the development of longer-term systems, both at the national and regional levels.

Table 6 shows the proposed SAP Framework for EAF Governance and Management of eastern Caribbean Flyingfish in the CLME, and with specific analysis of the linkages and framework of the SAP interventions and activities provided in *Appendix 1* to this report.

**Table 6: SAP Framework for EAF Governance and Management of the Eastern Caribbean Flyingfish in the CLME**

<b>Intervention</b>	<b>Strategy</b>	<b>Targets</b>	<b>Indicators</b>	<b>Investments</b>	<b>Timeframe</b>	<b>Cost</b>	<b>Responsibility</b>
<p>1. Establish sub-regional EAF governance arrangement for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.</p> <p>2. Strengthen National EAF governance arrangements for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.</p>	<p>1a. Support for the empowerment and equipment of the CRFM to lead the regional management activities for the fourwing flyingfish and to establish a sub-regional management agreement with France.</p> <p>2. Empower NICs / FACs in the Eastern Caribbean to</p>	<p>1a. Formal sub-regional EAF management agreement between CRFM and France for the Eastern Caribbean fourwing flyingfish fishery, established and operational.</p> <p>1b. Establish a sub-regional data, information, and knowledge exchange management system to</p>	<p>1a (i). Sub-regional EAF management plan for the Eastern Caribbean fourwing flyingfish fishery formally endorsed by all countries and functional.<sup>4</sup></p> <p>1a (ii). One EAF management period cycle of operation successfully implemented.</p> <p>1b. CLME's IMS-REMP continued/</p>	<p>1a (i). CRFM to hold consultations France to establish sub-regional EAF management agreement for the Eastern Caribbean fourwing flyingfish.</p> <p>1a(ii). CRFM and the relevant departments of France will need to include among their activities, the additional monitoring and management activities associated with the provisions of the sub-regional EAF management agreement.</p> <p>1b. CRFM and France to invest in the management of CLME's</p>	<p>1a (i). One year.</p> <p>1a(ii) Two years</p> <p>1b. Two years</p> <p>2. Two years</p> <p>3. Three years</p>		<p>1. CRFM, France and the Eastern Caribbean Departments of France</p> <p>2. Countries within the Eastern Caribbean</p>

	<p>monitor, manage and evaluate EAF management performance at the national level and to represent national interests in the sub-regional management arrangement for the Eastern Caribbean fourwing flyingfish.</p>	<p>support sub-regional EAF management planning and decision-making (successor to CLME's IMS-REMP). 2a NICs / FACs strengthened / empowered for active and direct involvement in national activities pertaining to governance of fourwing flyingfish fisheries. 2b. Strengthened / expanded National data, information and knowledge exchange systems. 2c. Complete and empowered stakeholder representation in fisheries governance planning and decision-making. 2d. Ratification</p>	<p>strengthened/ formally mainstreamed, with sub-regional information products used for EAF management planning and decision-making. 2a(i). NIC / FAC EAF management plan for the Eastern Caribbean fourwing flyingfish fishery. 2a (ii). One national EAF management period cycle of operation successfully implemented. 2b. National data, information and knowledge exchange systems expanded/ strengthened to contribute effectively to the continuation of CLME's IMS-REMP, with national</p>	<p>IMS-REMP successor. 2a(i). Investment for legislating and enforcing the NIC concept. 2b. Investment in development of data, information and knowledge products at the national level for informing EAF management of the Eastern Caribbean fourwing flyingfish fishery. 2c. Investment in development of national stakeholder network and contributions to NIC / FAC. 2.d Investment in ratification of multilateral treaties, updating of EAF and fisheries legislation and delimitation of marine boundaries</p>			
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		of multilateral fisheries and environmental treaties, EAF and fisheries legislation updated, national regulations enacted, marine boundaries delimited	information products used for EAF management planning and decision-making at both the national and regional levels. 2c. Multilateral treaties ratified, EAF and fisheries legislation and regulations updated and enacted, maritime boundaries delimited				
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## 9.2 Specific interventions, activities and reforms to be implemented for effective governance and management of the flyingfish fisheries using an ecosystem-based approach

*Under Intervention 1 of SAP table: establish sub-regional EAF governance arrangement for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.*

### 1.1 Legal and policy interventions/activities (Berry, D.S. & U. Tietze. 2012)

- 1.1.1 Provision of legal and technical assistance to Barbados, Dominica, Grenada, Martinique, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, **if and as required, to ratify all of below multilateral fisheries and environmental treaties, either as individual states or through a representative regional organization.** Such a move would ensure both the consistency of their treaty obligations and their participation in, and awareness of, related fisheries and environmental developments. The concern expressed about the already onerous obligations assumed by some member states in relation to treaties (in terms of legislative requirements and reporting obligations), could be addressed by representative membership through a regional organisation, or by means of technical assistance by a regional organisation. Ratification of the following treaties is recommended (in order of priority):
- the *United Nations Convention on the Law of the Sea*,
  - the *Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks*,
  - the *International Convention for the Conservation of Atlantic Tunas*,
  - the *Agreement Establishing the Caribbean Regional Fisheries Mechanism*,
  - the *Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (FAO Compliance Agreement)*,
  - the *Common Fisheries Policy Agreement*,
  - the *Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*,
  - the *Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention)* and
  - the *Protocol concerning specially protected areas and wildlife to the Convention for the protection and development of the marine environment of the wider Caribbean region (the SPAW Protocol)*.
- 1.1.2. Provision of legal and technical assistance, if and as required, to **States adjacent to the French territories of the Eastern Caribbean**, or Caribbean regional organizations for the **establishment of arrangements similar to the *Agreement on Fisheries between the European Economic Community and the Government of the Commonwealth of Dominica***. Such treaty arrangements should explicitly adopt principles such as: using the best available scientific information, applying the precautionary and ecosystem based approaches to fisheries management, the principle of sustainable use, the participatory approach, and principles of good governance. The treaty should mention the fish stocks of interest, including Eastern Caribbean flyingfish.
- 1.1.3 Provision of legal and technical assistance, in relation to **non-binding international legal instruments**, to States to both **publicize and utilize their relevant principles and approaches**, particularly those set out in the FAO Code of Conduct for Responsible Fisheries, its related Plans of Action and Technical Guidelines, and the Castries Declaration on Illegal, Unreported and Unregulated Fishing. These principles and best practices also **should be formally incorporated into national legislation** as should the provisions of any agreements to which a country is signatory.

- 1.1.4. Provision of technical and financial assistance to **regional organizations to enable them to help their Member States harmonize their fisheries policies, practices and laws.** Regional organizations should be tasked with helping to mobilize technical and financial resources. They should also be called upon to assist Member States with their reporting obligations under regional and international treaties. The **CRFM Ministerial Council, Caribbean Sea Commission of the Association of Caribbean States, and WECAFC all should be used to help promote cooperation on fisheries and environmental issues.**
- 1.1.5 Development of a **binding agreement** on the conservation management and sustainable use of the flyingfish resources.

## **1.2 Fisheries Management and Conservation (CRFM, 2012c)**

- 1.2.1 **CRFM should be authorized and strengthened to assume the role as appropriate regional flyingfish management authority tasked initially with the implementation review and evaluation of the regional flyingfish management plan.** The initial task would be carried out with technical advice from the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean in cooperation with fishers' organisations and the fishing industry ((Berry, D.S. & U. Tietze. 2012).
- 1.2.2 **CRFM Ministerial Sub-Committee on Flyingfish** should be fully operationalized for policy decision making to develop and implement an EAF plan for Eastern Caribbean Flyingfish and to implement selected key EAF activities (CERMES, 2012; Berry, D.S. & U. Tietze. 2012).
- 1.2.3 **Provision of technical assistance to revise the present functioning and structure of national Fisheries Advisory Committees to assure participation of all fisheries sub-sectors.** Stakeholders from sectors other than fisheries, who have an impact or interest in flyingfish fisheries and its ecosystem, should also be represented. The selection process for members of Fisheries Advisory Committees should be made transparent and carried out in close consultation with the groups which are to be represented on the FAC. The structure and functioning of the FACs should be more clearly defined and operational ensuring, among other things, that the chairperson of the committees has sufficient time to fulfill her / his task.

Fisheries Advisory Committees should closely liaise with National Inter-sectoral Committees (NICs), advocated by the CLME project, to ensure the application of EAF principles to management of the fisheries sector and the ecosystem which sustains it as well as full integration of efforts of all stakeholders at the national and regional level.

- 1.2.4 **Draft 2012 Sub-Regional Fisheries Management Plan for Flyingfish in the Eastern Caribbean** discussed at First Meeting of the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean to be reviewed, finalized and adopted according to time frame specified in implementation plan, which was agreed on at the meeting.

**The management functions to be carried out by CRFM** include (a) regularly review the status of the flyingfish stocks and identification of actions required for their conservation and management, (b) the adoption of proposals for joint action of Member States and Cooperating States and Territories in the Caribbean designed to achieve sustainable use of the flyingfish resources, (c) development of joint conservation and management measures and a harmonized monitoring, control and inspection scheme to ensure compliance with management and conservation measures, d) review of compliance with adopted conservation and management measures and implementation of adopted monitoring, control, surveillance and enforcement



measures. The participation of Martinique as well as other Caribbean States or Territories having a real interest in the flyingfish fishery is already envisaged in the membership provisions of the CRFM Ministerial Sub-committee on Flyingfish.

- 1.2.5 **CRFM / WECAFC Working Group on Flyingfish** in the Eastern Caribbean should be fully activated by securing the active participation of all seven members (CERMES, 2012; Berry, D.S. & U. Tietze. 2012)

### 1.3 Fisheries Research, Data Collection and Sharing

- 1.3.1 Technical and financial support, including equipment, for **monitoring, control and surveillance of flyingfish fisheries to be carried out by the national fisheries authorities as well as at the sub-regional level in close cooperation with the CRFM Ministerial Sub-committee on Flyingfish.** The functions of CRFM would include developing a harmonized monitoring, control and inspection scheme to ensure compliance with management and conservation measures, to review compliance with adopted conservation and management measures depending on the Preparation of a Protocol under the Caribbean Community Common Fisheries Policy and in line with the Castries Declaration on IUU Fishing.

- 1.3.2 Provision of technical and financial support for **establishment of a regional data base** for catch and effort data and other relevant data on the eastern Caribbean flyingfish. The database should be managed by the CRFM in cooperation with the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean. The data base should include flyingfish catches and effort from all harvesting states, including Martinique. It should eventually also encompass biological, ecological, oceanographic, economic and social data.

- 1.3.3 Provision of technical and financial support for **conduct of study on the impact of land and sea based human activities as well as of climate change on habits, life cycles and food webs of flyingfish and the productivity of related marine ecosystems.** Known hotspots in the Caribbean Large Marine Ecosystem of pollution loading and pollution from land and sea based activities should be selected and their impact on the productivity of adjacent marine ecosystems, ecosystem processes and services including flyingfishes and their food webs should be investigated. Generation of information to be used by policymakers and stakeholders in ICZM, marine spatial planning and restoration of marine ecosystems; study to be guided by CRFM SCPWG and findings to be discussed at CRFM Annual Scientific Meeting.

The information to be generated by the study should be treated as baseline information, which is to be regularly updated through sample surveys and other means in close cooperation with the stakeholders involved. There is further a need for continued active research to ensure strong understanding of the resources and the ecosystem and to keep this understanding current and up to date as well as to inform the development of EAF performance indicators, which would be monitored on a more routine basis. This also applies for the studies mentioned under 1.3.4 and 1.3.5.

- 1.3.4 **Conduct of a sub-regional cost and earnings study and comparison of the economic and financial performance of flyingfish fisheries and flyingfish value addition in selected countries of the Eastern Caribbean.** The purpose of the study would be the generation of advice to CRFM member states for improving the economic and financial performance and benefits of flyingfish fisheries and related value addition in the sub-region through national or sub-regional initiatives and assessment of economic contribution of flyingfish fisheries to regional economy. The study would also shed light on the profitability of individual flyingfish enterprises / fishing

units and identify the factors which positively or negatively affect economic and financial performance. The study is to be guided by CRFM SCPWG and the findings to be discussed at the CRFM Annual Scientific Meetings. The study is to be carried out in close cooperation with fishers' organizations including the identification of information needs, study design, data collection and analysis.

- 1.3.5 **Conduct of a social-economic study of flyingfish fishers and processors in selected countries of the Eastern Caribbean.** The purpose of this study would be the generation of information on (a) vocational skills and mobility; (b) patterns of ownership, operation and management of fishing vessels, operations and crews; (c) level of education; (d) income and ownership of assets; (e) demographic profile of households; (f) housing conditions and use of services and utilities; (g) financial and training needs and other aspects. The study would generate information on needs of fishers for training, technical financial and other kinds of assistance at the national or sub-regional level that might lead to a more sustainable and beneficial use of flyingfish resources and for a better involvement of fishers and their associations in the management and conservation of flyingfish resources and the aquatic environment.

The study is to be carried out in close cooperation with fishers' organizations including the identification of information needs, study design, data collection and analysis, guided by the CRFM SCPWG, and with findings to be discussed at CRFM Annual Scientific Meeting. Such a study should draw on and complement the recently completed Diagnostic Study to Determine the Poverty Levels in Fishing Communities in selected CARICOM / CRFM Member States to the extent that the study covers fishers, who are involved in flyingfish fisheries in Barbados, Grenada, Saint Vincent and the Grenadines and Trinidad and Tobago.

#### **1.4 Stakeholder Participation (CRFM, 2012a)**

- 1.4.1 Provision of technical and financial support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the development of a participation strategy with an implementation plan. The strategy should aim to encourage participation at all levels at the EAF management cycle, i.e. a) generation of data and information, b) analysis of information and generation of advice, c) decision-making, d) implementation and e) review and evaluation and adaptation of management approaches, strategies and plans.

It is expected key stakeholders such as the Caribbean Network of National Fisherfolk Organizations (CNFO) are to play an advisory role at the regional level similar to the role FACs are supposed to play at the national level. The stakeholder participation interventions should give special attention to the needs and interests of vulnerable groups within fishing communities and strengthen their resilience. For this reason, the participation strategy should include a sub-strategy to empower vulnerable and poor segments of the fisheries sector through small-scale enterprise development with training and microfinance support, provision of health and other social services and thus enable them to meaningfully participate in the conservation and management of fishery resources and the CLME.

- 1.4.2 Provision of technical and financial support for the Improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the development of a communication strategy with an implementation plan. The communication strategy should aim to improve public awareness and understanding of the importance of the fishery and build support for improved management. Key stakeholders such as the Caribbean Network of National Fisherfolk Organizations (CNFO) are to develop their own positions on

various issues related to fisheries and ecosystem management and conservation and communicate such positions to other stakeholder and policy makers.

- 1.4.3 Provision of technical and financial support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the establishment of Action Learning Groups (ALGs) to improve peer learning and support for engagement in Governance.
  - 1.4.4 Provision of technical support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the development of a financing strategy with a fund-raising plan.
  - 1.4.5 Provision of technical and financial support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through mentoring and coaching of stakeholder groups.
2. *Under Intervention 2 of SAP table: Strengthen national EAF governance arrangements for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.*
- 2.1 Legal and policy interventions/activities (Berry, D.S. & U. Tietze. 2012).
    - 2.1.1 Provision of legal and technical assistance to **State's efforts to delimit all of their maritime boundaries**. In the interim, if boundary delimitation is not possible at present, neighbouring states should enter into **bilateral or multilateral agreements allowing joint monitoring, control and surveillance (MCS)**. The OECS Common Fisheries Surveillance Zone could be used as a model, but ideally the scope should embrace the Wider Caribbean Sea.
    - 2.1.2 Provision of legal assistance to review **national fisheries laws of all of the states** to ensure that they conform to modern fisheries management standards. Where fisheries laws do not formally require the **provision of data to national authorities by fishers, this should be mandated**.
    - 2.1.3 Provision of legal assistance to ensure the **national laws fully implement the treaty obligations** assumed by each state.
    - 2.1.4 **National Regulations related to fisheries statutes should be enacted and implemented** (as permitted by the relevant Fisheries Act), and updated where necessary.
    - 2.1.5 Provision of technical assistance to review and update **fisheries management plans**, and where no such management plan exists, one should be created and brought into force as a matter of urgency.
    - 2.1.6 Provision of technical assistance to formally set out the **principles and best practices from non-binding instruments** – including the FAO Code of Conduct for Responsible Fisheries and the Castries Declaration on Illegal, Unreported and Unregulated Fishing – **in national legislation**. Such principles include: using the best available scientific information, applying the precautionary and ecosystem based approaches to fisheries management, the principle of sustainable use, the participatory approach and principles of good governance.
    - 2.1.7 Greater effort should be made to **harmonize national fisheries and environmental legislation** within the region. Technical assistance, as needed, should be provided for this purpose.

## 2.2 Fisheries Management, Research, Data Collection and Sharing

- 2.2.1 **Provision of technical assistance for expansion of coverage of data collection systems to systematically include flyingfish caught for bait at the national level and regional level by identifying and sampling vessels catching flyingfish for sale as bait in conjunction with registration and licensing fishing vessels and renewal of licenses. Other data and information needed for EAF should also be collected.** Such data improvements are to be shared with the CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean and the CRFM SCPWG, FACs and NICs as appropriate. The growth of flyingfish fisheries for bait should be discussed at forthcoming annual scientific meetings of CRFM. Stakeholders such as flyingfish fishers, buyers of flyingfish to be used as bait, fisherfolk associations and other stakeholders are to be involved in identifying suitable data collection mechanism and in interpretation and use of data collected. This should include the acquisition of and consultation on traditional knowledge of stakeholders.
- 2.2.2 **In addition to the expansion of the coverage of data collection systems in conjunction with registration and licensing of fishing vessels and renewal of licenses, there is also a need for provision of technical assistance for improvement of collection of catch statistics on flyingfish catches and effort in sub-region as part of general ongoing efforts to improve fisheries statistics systems.** This is to be achieved through (a) expansion of the use of Trip Interview Programmes (TIP), (b) adjustment of sampling systems to changing patterns of operations of flyingfish vessels, (c) identification of causes for possible under-recording of flyingfish catches, (d) better training of data collectors, (e) improvements of data recording systems, (f) use of CARIFIS and (g) sharing of national data sets with CRFM SCPWG and CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean. Stakeholders such as flyingfish fishers, buyers of flyingfish to be used as bait, fisherfolk associations and other stakeholders are to be involved in identifying suitable data collection mechanism and in interpretation and use of data collected.
- 2.2.3 **Provision of assistance for allocation of more staff and resources for the collection, recording and analysis of fisheries statistics.** This should include better training for staff dealing with the collection, analysis and sharing of flyingfish and other fisheries statistics. This may require investment to educate those concerned about the value of the information generated from these statistics.
- 2.2.4 **Provision of technical assistance for harmonization and improvement of national vessel registration and licensing systems and expansion of the use of LRS to clearly identify vessels fishing for flyingfish.** LRS should track the change of ownership, base of operation and use of vessels and provide information on licensed/registered flyingfish vessels to CRFM to be incorporated in a future regional LRS data base of CRFM. Stakeholders such as flyingfish fishers, fisherfolk associations and other stakeholders should be involved in identifying suitable data collection mechanism and in interpretation and use of data collected.
- 2.2.5 **Provision of technical support for expansion of fisheries extension services.** These services are to be expanded with the purpose of educating fishers in both vocational and resource management and conservation matters including involving fishers' associations, fish processors and other stakeholders in the collection of catch, trade and processing data related to flyingfish and other fisheries.

## **2.3 Stakeholder Participation (CRFM, 2012a)**

- 2.3.1 Provision of technical and financial support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the development of a participation strategy with an implementation plan. The strategy should aim to encourage participation at all levels at the EAF management cycle, i.e. (a) generation of data and information, (b) analysis of information and generation of advice, (c) decision-making, (d) implementation and (e) review and evaluation and adaptation of management approaches, strategies and plans.

National fisherfolk organizations are to play an advisory role at the national level. The stakeholder participation interventions should give special attention to the needs and interests of vulnerable groups within fishing communities and strengthen their resilience. For this reason, the participation strategy should include a sub-strategy to empower vulnerable and poor segments of the fisheries sector through small-scale enterprise development with training and microfinance support, provision of health and other social services and thus enable them to meaningfully participate in the conservation and management of fishery resources and the CLME.

- 2.3.2 Provision of technical and financial support for the Improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the development of a communication strategy with an implementation plan. The communication strategy should aim to improve public awareness and understanding of the importance of the fishery and build support for improved management. National Fisherfolk Organizations (CNFO) are to develop their own positions on various issues related to fisheries and ecosystem management and conservation and communicate such positions to other stakeholder and policy makers.
- 2.3.3 Provision of technical and financial support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the establishment of Action Learning Groups (ALGs) to improve peer learning and support for engagement in Governance.
- 2.3.4 Provision of technical support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through the development of a financing strategy with a fund-raising plan.
- 2.3.5 Provision of technical and financial support for the improvement of stakeholder engagement in management and governance of flyingfish fishery in the Wider Caribbean Region through mentoring and coaching of stakeholder groups.

## **9.3 Implementation arrangements**

While all interventions / activities listed above are deemed to be pertinent for the effective governance and management of the flyingfish fisheries using an ecosystem-based approach, their relevance differs as far as their assessed priority, time frame and cost are concerned (table 7).

Keeping in mind the need for a phased approach to the implementation of the SAP, also because of limited resources available for implementation, it is assumed here that phase one interventions / activities are those interventions, which have a high priority and can be implemented in the short-term. These interventions / activities are highlighted in blue. Phase two interventions are assumed to be interventions

with a high priority, which can only be implemented in the medium and long-term. They are highlighted in green.

The distinction between phase one and phase two interventions / activities has been made because it is assumed that the implementation of a SAP gains momentum when results become visible already in the short-term. Or in other words: once high priority interventions / activities have been successfully implemented, public/political support can be more easily secured for the implementation of other high priority interventions which require a longer timeframe for implementation.

Phase three interventions / activities are those with a medium priority regardless of their time frame. They are highlighted in red. None of the interventions / activities listed in the table are considered of a low priority. However, it is suggested that the assessments made in this report are reviewed and priorities reaffirmed by the concerned stakeholders indicated in table 7 as being responsible for implementation.

**Table 7: Implementation Arrangement for specific SAP Interventions/Activities for EAF Governance and Management of Flyingfish Fisheries in the WCR**

Intervention / activity	Responsible party <sup>5</sup>	Priority (l:low, m:medium, h:high)	Timeframe (s:short-term m:medium-term, l:long-term)	Cost (l:low m:medium h:high)
<b>1.1 Sub-regional EAF legal and policy interventions</b>				
1.1.1 Ratification of multilateral fisheries and environmental treaties	MBDA, NGA, RFO	h	m	l
1.1.2 Agreements with French territories of the Eastern Caribbean	MBDA, NGA, RFO	h	s	l
1.1.3 Incorporation of non-binding international legal instruments into national legislation	MBDA, NGA, RFO	h	m	l
1.1.4 Regional organizations to help their Member States harmonize their fisheries policies, practices and laws	MBDA, RFO, NGA	h	m	m
1.1.5 Development of a binding agreement on the conservation management and sustainable use of the flyingfish resources	RFO, NGA	h	s	l
<b>1.2 Sub-regional EAF management and conservation</b>				
1.2.1 Strengthen CRFM as regional flyingfish management authority	RFO, NGA, RS, NS	h	s	l
1.2.2 Full activation of CRFM Ministerial Sub-Committee on Flyingfish	RFO, NGA, RS	h	s	l

<sup>5</sup> RFO : Regional Fisheries Organization, MBDA : multi- or bilateral development agency, NGA : National Government Authorities, RS : Regional Stakeholders, NS : National Stakeholders, RTI: Research/Training Institution

1.2.3 Revision of functioning and structure of national Fisheries Advisory Committees	MBDA, NGA, NS, RFO	h	s	l
1.2.4 Finalization of 2012 Sub-regional Flyingfish Management Plan	RFO, NGA, RS, NS	h	s	l
1.2.5 Full activation of CRFM/WECAFC Working Group on Flyingfish	NGA, NS, RFO	h	s	l
<b>1.3 Fisheries Research, data collection and sharing</b>				
1.3.1 Monitoring, control and surveillance of flyingfish fisheries	MBDA, RFO, NGA, RS, NS	h	m	h
1.3.2 Establishment of a regional data base for catch and effort and other data	MBDA, RFO, NGA, NS	h	s	h
1.3.3 Study of impact of land and sea based human activities on habits, life cycles and food webs of flyingfish	MBDA, RFO, RTI	m	m	m
1.3.4 Study of economic and financial performance of flyingfish fisheries and value addition	MBDA, RFO, RTI	h	m	m
1.3.5 Socio-economic study of flyingfish fishers and processors	MBDA, RFO, RTI	h	m	m
<b>1.4 Sub-regional stakeholder interventions</b>				
1.4.1 Development of participation strategy	MBDA, RFO, RS, RTI	h	s	m
1.4.2 Development of communication strategy	MBDA, RFO, RS, RTI	h	s	m
1.4.3 Establishment of Action Learning Groups	MBDA, RFO, RS, RTI	m	m	l
1.4.4 Development of a financing strategy and fund-raising plan	MBDA, RFO, RS, RTI	m	m	l
1.4.5 Mentoring and coaching of stakeholder groups	MBDA, RFO, RS, RTI	m	m	l
<b>2.1 National EAF legal and policy interventions/activities</b>				
2.1.1 Mentoring and coaching of stakeholder groups	MBDA, NGA, RFO	h	s	m
2.1.2 Review of national fisheries laws regarding modern fisheries management standards	MBDA, NGA, RFO	h	m	m
2.1.3 Provision of legal assistance to ensure national laws fully implement treaty	MBDA, NGA, RFO	h	m	m

obligations				
2.1.4 Provision of legal assistance to ensure national laws fully implement treaty obligations	NGA, NS	h	m	l
2.1.5 Review and update fisheries management plans	MBDA,NGA, RFO	h	s	m
2.1.6 Set out principles and best practices from non-binding instruments in national legislation	MBDA,NGA, RFO	m	m	m
2.1.7 Harmonization of national fisheries and environmental legislation within region	MBDA,NGA, RFO	m	m	m
<b>2.2 National EAF management, research and data collection interventions</b>				
2.2.1 Expansion of coverage of data collection	MBDA,NGA,RFO	h	s	m
2.2.2 Improvement of collection of catch statistics on flyingfish catches and effort	MBDA,NGA,RFO	h	s	h
2.2.3 Allocation of more staff and resources for the collection, recording and analysis of fisheries statistics	MBDA,NGA	h	m	m
2.2.4 Harmonization and improvement of national vessel registration and licensing systems and expansion of the use of LRS	MBDA,NGA,RFO	h	s	m
2.2.5 Expansion of fisheries extension services	MBDA,NGA,RFO,NS	m	m	m
<b>2.3 National EAF stakeholder interventions</b>				
2.3.1 Development of participation strategy	MBDA, RFO, NS,RTI	h	s	m
2.3.2 Development of communication strategy	MBDA, RFO,RTI	h	s	m
2.3.3 Establishment of Action Learning Groups	MBDA, RFO, NS,RTI	m	m	l
2.3.4 Development of financing strategy	MBDA,RFO, NS,RTI	m	m	l
2.3.5 Mentoring/ coaching of stakeholder groups	MBDA, RFO, NS,RTI	m	m	l

## 10. MONITORING AND EVALUATION

In the general SAP document for the CLME and adjacent regions, two interventions and seven broad activities are identified to be implemented for the Eastern Caribbean fourwing flyingfish fisheries. Under these broad activities, the SAP for the Eastern Caribbean fourwing flyingfish fisheries presented in this



report identified 37 specific activities shown above for implementation. For the purpose of monitoring and evaluation, the broad interventions and activities of the general SAP are considered here.

### **10.1 Broad interventions and activities for Eastern Caribbean fourwing flyingfish identified in general SAP document**

#### Intervention 1:

Establish sub-regional EAF governance arrangement for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.

#### Activities:

- Formal sub-regional EAF management agreement between CRFM and France for the Eastern Caribbean fourwing flyingfish fishery, established and operational.
- Strengthening of regional organization's own capacity for cooperation with non-member States participating in fishery (regional org -3rd party cooperation strengthened).
- Strengthening of regional organization's capacity for effective regional-national cooperation (regional-national linkages strengthened and effective).
- Establish a sub-regional data, information, and knowledge exchange management system to support sub-regional EAF management planning and decision-making (successor to CLME's IMS-REMP).

#### Intervention 2:

Strengthen National EAF governance arrangements for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.

#### Activities:

- 2.1 NICs and FACs strengthened/ empowered for active and direct involvement in national activities pertaining to governance of fourwing flyingfish fisheries (review and keeping legislation updated, adherence to international agreements, public education, formal NIC arrangement and Plan of Action, support for 1-2 policy cycles).
- 2.2 Strengthened / expanded national data, information and knowledge exchange systems (at national level and national-regional linkages).
- 2.3 Complete and empowered stakeholder representation in fisheries governance planning and decision-making (local capacity building and education for contribution to NIC and FAC process (mechanism for local-NIC, FAC interactions, and implementation, reflected by consultations and reports).

The general SAP identifies the CRFM as lead agency tasked with the implementation of these interventions and activities.

### **10.2 Responsible parties and mechanisms**

The main responsibility for monitoring and evaluating the implementation of the interventions and activities of the SAP for the Eastern Caribbean fourwing flyingfish fisheries rests with the organizations, which are tasked with the implementation of specific particular interventions and activities as identified in

table 6. The overall responsibility for the coordination of all monitoring and evaluation activities lies with the CRFM.

Furthermore, multi and bi-lateral development agencies, funds, financial institutions as well as government and non-government agencies, including stakeholder organizations, which will be funding and investing in the implementation of particular activities, will monitor and evaluate the use of their finances and the outcome of interventions and activities following their own established procedures.

It is recommended here that organizations and institutions involved in the implementation and financing of a particular activity should (1) inform each other on their monitoring and evaluation procedures and adjust these procedures as necessary to make them compatible. Monitoring information should be exchanged on a semi- annual basis among all concerned organizations. A review of progress with the implementation of each activity should be conducted on an annual basis. An evaluation of the impact and outcome of each intervention and the underlying activities should be conducted after three years.

CRFM, as the lead implementing organization should take the lead in all monitoring and evaluation activities. Within the CRFM, the CRFM Ministerial Sub-committee on Flyingfish and the CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean would act as focal points for the coordination of all monitoring and evaluation activities and share the information with other regional and sub-regional organizations and stakeholders in EAF in the CLME and adjacent regions. CRFM's Fisheries Forum and the CRFM Annual Scientific Meetings will also play a key role in monitoring and evaluating implementation, outcome and impact of all monitoring and evaluation activities.

## **11. FINANCING MECHANISMS**

The case study on fourwing flyingfish fisheries in the Eastern Caribbean suggested that at the national level, fisheries administrations and the fishery sector in general are often assigned a low priority, as compared to other sectors, when financial resources are allocated by national level government authorities. At the same time, the fishery sectors both at the regional and national level have received considerable multi- and bi-lateral donor support in the past. This support has been directed both at small-scale fishery infrastructure support as well as at management and institutional support including support to fisherfolk associations and cooperatives.

For the SAP to succeed, it is assumed here that donor support will have to continue. This has been indicated in table 7 for each of the specific interventions, where multi- or bilateral development agencies will have to play a role.

At the same time there is an urgent need for higher budget allocations at the national level (and possibly at the regional level, too) as well as for higher private investment and credit support from institutional finance. These higher allocations can only be expected to materialize if the fishery sector becomes more transparent and demonstrates its beneficial economic and ecological role and also a more transparent governance structure with full participation and involvement of all concerned stakeholders and the general public. With a view to initiate and support such changes, the SAP includes activities for a stronger participation of FACs and the establishment of NICs as well as a number of studies, which can guide private capital investment and credit flows from institutional finance.

Much of the financing for the implementation of the SAP will have to be done at the national level. In addition to higher budget allocations at the national level, strategies for management cost recovery through user, license, registration fees and fines need to be introduced and implemented. Funding for the establishment and maintenance of regional data bases as well as for carrying out regional management

functions of advisory and control and surveillance nature will have to be secured by the CRFM and the CRFM/WECAFC Working Group on flyingfish in the Eastern Caribbean with support of multi- and bilateral donor agencies and funds.

## 12. CONCLUSIONS

The Strategic Action Programme (SAP) for the Eastern Caribbean fourwing flyingfish fisheries described in this report has been completed as part of a contract awarded to the Caribbean Regional Fisheries Mechanism (CRFM) by the Caribbean Large Marine Ecosystem (CLME) Project “*Sustainable Management of the shared Living Marine Resources of the Caribbean Large Marine Ecosystems and Adjacent Regions*”. The goals of the CLME Project are being pursued through regional-level and fishery/ecosystem-specific projects and studies. The Project seeks to evaluate and strengthen the technical-scientific information and knowledge base and to use it to inform the formulation of a SAP that will embrace a shared and ecosystem-based management vision for the CLME, and to document agreed priority actions, i.e. policy, legal and investment reforms for advancing the proposed ecosystem approach. The CRFM was responsible for executing two case studies for the CLME project that were aimed at strengthening the technical-scientific information and knowledge base and at examining options for promoting an ecosystem approach to fisheries governance for (i) the Eastern Caribbean flyingfish fishery and (ii) the large pelagic fishery. The case studies produced four reports on the review of existing policy, legal and institutional arrangements for the governance and management of each of the two fisheries and stakeholder analyses as well as three data collection improvement reports and scientific meeting reports that document findings of the technical-scientific components of the case studies.

It is hoped that the Strategic Action Programme for the effective governance and management of flyingfish fisheries in the Eastern Caribbean presented in this report will be found useful by all stakeholders concerned and provide guidance on the path to a sustainable management of the shared Living Marine Resources of the Caribbean Large Marine Ecosystem.

The overall vision of the SAP for flyingfish fisheries in the Wider Caribbean Region (WCR) encompasses healthy marine ecosystems that are adequately valued and protected through robust, integrative and inclusive governance arrangements at local, national, sub-regional and regional levels that effectively enable adaptive management, which maximizes, in a sustainable manner, the provision of goods and services in support of enhanced livelihoods and human well-being.

The overarching Ecosystem Quality Objective (EcoQO) encompasses healthy pelagic ecosystems including the conservation, protection and/or restoration of the fish stocks and biodiversity of the pelagic ecosystem. The overarching Societal Benefit Objective (SBO) encompasses the provision of goods and services by the ecosystems so that it maximizes the systems contributions to societal wellbeing and development needs in the Wider Caribbean Region including the preservation of aesthetic, traditional, health and scientific values of the ecosystem.

The objectives of the SAP proposed in this report are fully compatible with the management goals, objectives and indicators proposed in the 2012 Update of the Sub-regional Management Plan for Flyingfish Fisheries in the Eastern Caribbean, shown in Table 1 of this report. The SAP identifies broad interventions, strategies, targets, indicators, investments, timeframes, costs and responsibilities that are needed for achieving effective governance and management of flyingfish fisheries in the WCR (Table 5). Based on the findings of the case studies, these broad interventions have further been sub-divided into specific interventions and reforms to be implemented for effective governance and management of the flyingfish fisheries using an ecosystem-based approach.

While the main responsibility for monitoring and evaluating the implementation of the interventions and activities of the SAP for the Eastern Caribbean fourwing flyingfish fisheries rests with the organizations, which are tasked with the implementation of specific particular interventions and activities, The overall responsibility for the coordination of all monitoring and evaluation activities lies with the CRFM.

As mentioned in the previous section, donor support will have to continue for the SAP to succeed. At the same time there is an urgent need for higher budget allocations at the national level as well as for higher private investment and credit support from institutional finance. For this to happen, the fishery sector needs to demonstrate its beneficial economic and ecological role and a more transparent governance structure with full participation and involvement of all concerned stakeholders and the general public.

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## **APPENDIX 1: SAP LINKAGES AND FRAMEWORK**

### **Interventions / activities**

The reference numbers in the first column of the table refer to the following interventions and activities.

#### Intervention 1:

Establish sub-regional EAF governance arrangement for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.

#### Activities:

- 1.1 Formal sub-regional EAF management agreement between CRFM and France for the Eastern Caribbean fourwing flyingfish fishery, established and operational.
- 1.2 Strengthening of regional organization's own capacity for cooperation with non-member States participating in fishery (regional org - 3rd party cooperation strengthened).
- 1.3 Strengthening of regional organization's capacity for effective regional-national cooperation (regional-national linkages strengthened and effective).
- 1.4 Establish a sub-regional data, information, and knowledge exchange management system to support sub-regional EAF management planning and decision-making (successor to CLME's IMS-REMP).

#### Intervention 2:

Strengthen National EAF governance arrangements for implementing EAF management of the Eastern Caribbean fourwing flyingfish fishery.

#### Activities:

- 2.1 NICs strengthened / empowered for active and direct involvement in national activities pertaining to governance of fourwing flyingfish fisheries (review and keeping legislation updated, adherence to international agreements, public education, formal NIC/FAC arrangement and Plan of Action, support for 1-2 policy cycles).
- 2.2 Strengthened / expanded national data, information and knowledge exchange systems (at national level and national-regional linkages).
- 2.3 Complete and empowered stakeholder representation in fisheries governance planning and decision-making (local capacity building and education for contribution to NIC / FAC process (mechanism for local-NIC / FAC interactions, and implementation, reflected by consultations and reports).

### ***Targets***

With reference to column 4 of below table, there two indicators for intervention 1 and four indicators for intervention 2 (see table 6).

- 1a. Formal sub-regional EAF management agreement between CRFM and France for the Eastern Caribbean fourwing flyingfish fishery, established and operational.
- 1b. Establish a sub-regional data, information, and knowledge exchange management system to support sub-regional EAF management planning and decision-making (successor to CLME's IMS-REMP).
- 2a. NICs / FACs strengthened/ empowered for active and direct involvement in national activities pertaining to governance of fourwing flyingfish fisheries.
- 2b. Strengthened / expanded National data, information and knowledge exchange systems.
- 2c. Complete and empowered stakeholder representation in fisheries governance planning and decision-making.
- 2d. Ratification of multilateral fisheries and environmental treaties, EAF and fisheries legislation updated, national regulations enacted, marine boundaries delimited

***Indicators***

With reference to column 5 of below table, there are three indicators for intervention 1 and three indicators for intervention 2 (see table 6).

- 1a (i). Sub-regional EAF management plan for the Eastern Caribbean fourwing flyingfish fishery formally endorsed by all countries and functional.<sup>6</sup>
- 1a (ii). One EAF management period cycle of operation successfully implemented.
- 1b. CLME's IMS-REMP continued / strengthened / formally mainstreamed, with sub-regional information products used for EAF management planning and decision-making.
- 2a(i). NIC / FAC EAF management plan for the Eastern Caribbean fourwing flyingfish fishery.
- 2a (ii). One national EAF management period cycle of operation successfully implemented.
- 2b. National data, information and knowledge exchange systems expanded / strengthened to contribute effectively to the continuation of CLME's IMS-REMP, with national information.

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**Table 1: Detailed analysis of intervention/ Activity: root cause being addressed; targets (goals); indicators; policy cycle components concerned; regional governance framework components concerned; agencies to be responsible; expected impacts for contributing to ecosystem health; analysis of feasibility and sustainability; requirement of legal reforms.**

Intervention / activity	Cause <sup>7</sup>	Description	Target	Indicator	Policy Cycle Level <sup>8</sup>	Regional Governance Framework Level <sup>9</sup>	Lead Agency <sup>10</sup>	Collaborating Agency <sup>11</sup>	Impact on Unsustainable Fisheries <sup>12</sup>	Impact on Habitat Degradation <sup>13</sup>
1	Root	Poor governance	1a, 1b	1a(i), 1a(ii)	3	2,3	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
1.1	Root	Poor governance	1a	1a(i), 1a(ii)	3	1,2,3	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
1.2	Root	Poor governance	2d	1a(i), 1a(ii)	6	1,2,3	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
1.3	Root	Poor governance	1b	1a(i), 1a(ii)	6	3,4	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
1.4	Root	Poor governance			1,2,3	3	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
2	Root	Poor governance	2a-d	2a(i), 2a(ii), 2b	6	4,5	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
2.1	Root	Poor governance	2a, 2d	2a(i)		4	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
2.2	Root	Poor governance	2b	2b		2,3,4	IGO-CRFM	GOV, PRIV, CS, NGO	H	M
2.3	Root	Poor governance	2c	2a(ii)		4	IGO-CRFM	GOV, PRIV, CS, NGO	H	M

<sup>7</sup> R:root, U:underlying, D:direct

<sup>8</sup> 1:data&information, 2:analysis&advice, 3: decision making, 4: implementation, 5: revision, 6: all

<sup>9</sup> 1: global/international, 2: regional, 3: sub-regional, 4: national, 5: local

<sup>10</sup> IGO: Inter-governmental organization, GOV: Government agency, PRIV: Private sector, CS: ?, NGO: Non-governmental Organization

<sup>11</sup> IGO: Inter-governmental organization, GOV: Government agency, PRIV: Private sector, CS: ?, NGO: Non-governmental Organization

<sup>12</sup> H: high, M: medium, L: low

<sup>13</sup> H: high, M: medium, L: low



**Table 1 (continued).**

<b>Intervention / activity</b>	<b>Impact on Pollution<sup>14</sup></b>	<b>Screening, needs Legal Reform</b>	<b>Screening, feasibility</b>	<b>Screening, sustainability</b>	<b>Screening, expected impact</b>
1	L	Y	H	H	H
1.1	L	N	H	H	H
1.2	L	N	H	H	H
1.3	L	N	H	H	H
1.4	L	N	H	H	H
2	L	Y	H	H	H
2.1	L	Y	H	H	H
2.2	L	N	H	H	H
2.3	L	N	H	H	H

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<sup>14</sup> H: high, M: medium, L: low