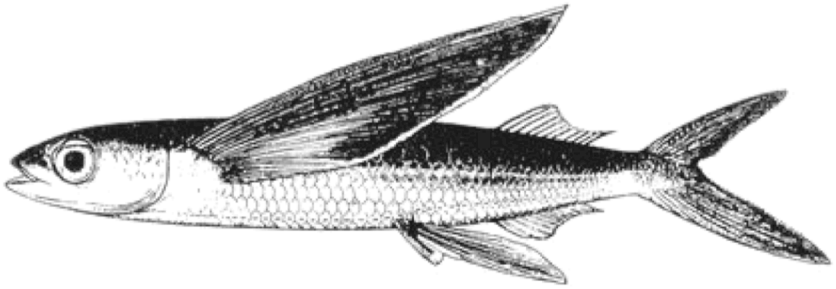
CERMES Technical Report No 57 (Rev. 1)

CRFM/CLME Eastern Caribbean Flyingfish Fishery Case Study – Governance Assessment

CENTRE FOR RESOURCE MANAGEMENT AND ENVIRONMENTAL STUDIES (CERMES)
AND CARIBBEAN REGIONAL FISHERIES MECHANISM (CRFM)



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Sustainable Management of the Shared Living Marine Resources of the Caribbean Large Marine Ecosystem (CLME) and Adjacent Regions

2013

CRFM/CLME Eastern Caribbean Flyingfish
Fishery Case Study – Governance Assessment

Centre for Resource Management and Environmental Studies

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Note on report revision

This “Rev. 1” version differs from the original in mainly one respect. The original Level 2 (performance) assessment, done primarily by CERMES with some reviewer comments, has been replaced with the results of a more participatory assessment conducted during the Second Meeting of the CRFM/CLME Eastern Caribbean Flyingfish Fishery Case Study Committee on 11 March 2013 in Dominica. The new section 4 describes the process and product. The other sections of the report are unchanged, there being no comments received on the re-draft shared after the Regional Validation Workshop on Governance and Management of Flyingfish and Large Pelagic Fisheries held 2-4 May 2012 in Grenada. Given the review and wider participation in the Level 2 assessment CRFM was added as co-author.

Contents

Acronyms

CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community and Common Market
CARICOMP	Caribbean Coastal Marine Productivity Programme
CCA	Causal Chain Analysis
CERMES	Centre for Resource Management and Environmental Studies
CIMH	Caribbean Institute for Meteorology and Hydrology
CLME	Caribbean Large Marine Ecosystem
COTED	Council for Trade and Economic Development
CRFM	Caribbean Regional Fisheries Mechanism
CSC	Caribbean Sea Commission
CSI	Caribbean Sea Initiative
CSME	CARICOM Single Market and Economy
EAF	Ecosystem Approach to Fisheries
EBM	Ecosystem-based Management
EEZ	Exclusive Economic Zone
FAO	Food and Agricultural Organization
GEF	Global Environmental Fund
ICCAT	International Commission for Conservation of Atlantic Tunas
IOCARIBE	Inter-governmental Oceanographic Commission – Caribbean Subcommision
IUU	Illegal, Unregulated and Unreported (fishing)
LAPE	Lesser Antilles Pelagic Ecosystem Project
LME	Large Marine Ecosystem
LMR	Living Marine Resources
MCS	Monitoring, Control and Surveillance
MEA	Multilateral Environmental Agreement
MPA	Marine Protected Area
MSY	Maximum Sustainable Yield
NGO	Non-Governmental Organization
OECS	Organization of Eastern Caribbean States
OSPESCA	Organization of the Fishing and Aquaculture Sector of the Central American Isthmus
SAP	Strategic Action Programme
SIDS	Small Island Developing States
TDA	Transboundary Diagnostic Analysis
TWAP	GEF Transboundary Waters Assessment Project
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
WCR	Wider Caribbean Region
WECAFC	Western Central Atlantic Fishery Commission

Summary

Assessments of governance such as this one for the Eastern Caribbean flyingfish fishery are few. Technical assessments of resources and their habitats are far more common. The purpose of this assessment is to examine and illustrate aspects of the governance arrangements for the five major issues identified for Eastern Caribbean flyingfish fishery in order to facilitate discussion among stakeholders. This discussion can lead to shared views of what should be in place, what principles should be prominent and how the system should be structured. The assessment is not intended to lead to a prescriptive output regarding what should be in place. Nonetheless, some broad observations can be made on aspects of the system that need attention if arrangements are to be structured to enable good governance, including the promotion of intersectoral and inter-issue integration that is needed for an ecosystem approach.

The assessment was carried out at two levels:

- Level 1 examined the governance arrangements or architecture
- Level 2 made a very preliminary assessment of their performance.

The issue examined was resource sharing (allocation, access and IUU fishing).

Ideally, the governance arrangement for the issues should have been assessed with much input from key stakeholders. However, this was not practically feasible. Apart from limited input from participants at the CRFM 10th Caribbean Fisheries Forum and feedback on a first draft at the CRFM Regional Validation Workshop on Governance and Management of Flyingfish and Large Pelagic Fisheries, 2- 4 May 2012 in Grenada, the assessment was done purely from the literature and the experience of the authors.

The first observation from Level 1 analysis is that the components of the CRFM (and WECAFC to a lesser extent) provide the institutional bulk of the governance arrangement concerning the Eastern Caribbean flyingfish fishery. Most of these are, however, merely potential since few are fully operational. Level 2 analysis is based on scanty evidence. Yet it suggests deficiencies in performance in the context of the general mode of operation of the CRFM based upon criteria for performance evaluation of governance.

Much of what is reported in this assessment can be attributed to the CRFM being a relatively young regional fisheries body. Its potential has not been activated in several areas as agreements on fisheries policy and IUU fishing, for example, are quite recent. Despite this, it is appropriate to query whether the CRFM (in its entirety) is an adaptive learning institution that can quickly develop the capacity to address these and other issues that arise. The same applies to WECAFC.

As stated before, the results presented in this report are primarily to encourage discussion at national and sub-regional levels. At this stage, it would be very informative for the fishery stakeholders (broadly categorised as at least government, harvest and postharvest) to thoroughly review the findings. It is very likely that their assessment of governance at both levels will differ from that given here and that there may be significant differences among the stakeholders as well. Again, at this stage, it is more important to fully understand these differences and the reasons behind them than to build consensus without this understanding as the foundation upon which to proceed.

We recommend that strengthening the governance arrangement for Eastern Caribbean flyingfish be included in the SAP, including linkages to the regional arrangements for pollution and potentially other issues through EAF. This requires that the SAP set out to:

- Fully activate the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean by securing the active participation of all seven members

- Fully operationalise the CRFM Ministerial Sub-Committee on Flyingfish for policy decision-making to
  - Develop and implement an EAF plan for Eastern Caribbean flyingfish
  - Implement selected key EAF activities

1 Introduction

1.1 The CLME Project and LME Governance Framework

The Caribbean Large Marine Ecosystem and Adjacent Areas (CLME) Project (www.clmeproject.org) aims to improve the management of shared living marine resources (LMR) within the Wider Caribbean Region (WCR). The Causal Chain Analyses and Transboundary Diagnostic Analyses (Heileman 2011, Phillips 2011) have identified weak governance as a root cause of the problems facing these social ecological systems (Mahon et al 2011a). The CLME Project therefore has a strong emphasis on assessing LMR governance systems and on proposing ways of strengthening them. Due to the overarching importance of governance in the CLME, among the typical five modules of an LME project, the subject has received special attention and some new thinking. The background to the way that governance is addressed in the CLME Project, including the development of the LME Governance Framework, is discussed in Mahon et al (2011a).

The CLME Project is designed to begin the process of building the framework for the WCR through a series of targeted activities aimed at specific parts of the framework and at testing the effectiveness of the LME Governance Framework concept (Mahon et al 2008, Fanning et al 2009b). This is expected to be a long term process of conceptualising, operationalising, testing, learning and adapting that involves the over two dozen countries in the WCR and its various ecosystems (e.g. continental shelf, pelagic and reef). This is no simple undertaking. It requires a systematic but incremental approach.

The purpose of the CLME pilot projects and case studies, such as this one, is to examine and understand key parts of the governance framework through 'learning by doing'. The pilots and cases explore, by means of practical examples, how developing functional policy cycles and linkages may lead to improved transboundary LMR governance in the WCR. These projects have been designed to encompass the full range of transboundary LMR situations, each with emphasis on a different level of the LME governance framework and a different geographical region of the WCR.

1.2 About this report

The governance assessment of these pilots and case studies uses a common methodology (Mahon et al 2012) that is summarised next. We then apply the methodology to assess governance of the Eastern Caribbean flyingfish fishery and set out lessons learned. This report is for discussion and use by all case study participants and interested parties. It contributes to the elaboration of the regional governance framework and formulation of the Strategic Action Programme (SAP) which is the next major stage of the CLME project. There is an abundance of literature related to this case. Since the target audience for this report comprises primarily fisheries stakeholders we assume familiarity with, or access via internet to this literature. Kindly consult the resources mentioned later if you require background on the fishery.

2 Overview of governance assessment

2.1 General approach to assessment

The approach to doing the LMR governance assessment for the CLME project builds on the methodology developed by Mahon and others (2011b, 2011c) for the Transboundary Waters Assessment Programme (TWAP). TWAP is a GEF project to develop indicators for monitoring all aspects of the projects in the GEF's International Waters (IW) portfolio. The methodology paper by Mahon et al (2012) addresses the monitoring of governance. While the focus is on the LME component of the IW Programme, the assessment approach and methodology was developed for the entire GEF IW programme. To a large

extent it was based on experience gained in developing the CLME Project and is therefore considered appropriate for adaptation to the CLME pilots and case studies.

Examples of how governance arrangements can be visualised include one for the Eastern Caribbean flyingfish fishery (Figure 1). It shows how management objectives drive different questions appropriate to various zones that align with the national, sub-regional and regional levels of jurisdiction in the policy cycle for this fishery. Different stages of the policy cycle are more prominent at different levels, such as decision-making needing to operate at the sub-regional level to manage the fishery, but naturally retaining links to national level decisions as well, thereby reflecting the nesting of institutional arrangements.

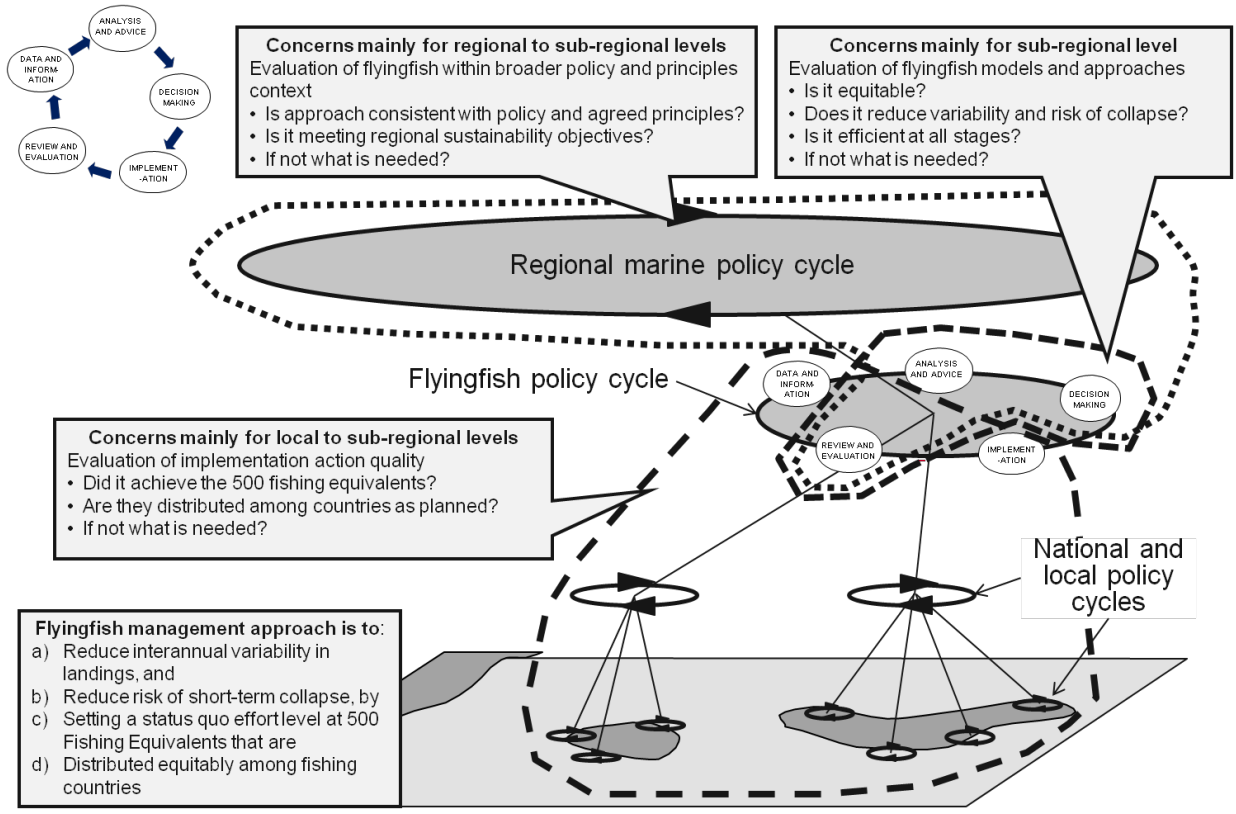


Figure 1 Eastern Caribbean flyingfish example of a multi-level policy cycle governance arrangement (Modified from Mahon et al 2011b)

The TWAP approach to be adopted and adapted here is two-level. It is described in detail by Mahon et al (2011b, 2011c). It has been adapted to the CLME pilots and case studies in a working paper (Mahon et al 2012). Level 1 assesses governance architecture or structural arrangements, and a methodology has been developed for this. Level 2 assesses the performance, or actual operational functioning, of the governance arrangements or architecture identified in Level 1. As an analogy, Level 1 is like the structure of a house. It should be well-designed to function with all the key components (e.g. has windows and doors). Level 2 is the functionality such as how well ventilation and security actually work (e.g. windows are not opened enough for air flow or doors are not closed securely) despite good design.

Level 1 assessment steps are outlined in Figure 2 and their outputs will be described in the assessment section. In summary, first we identify the social-ecological system that is the Eastern Caribbean flyingfish

fishery and then the main transboundary and shared issues related to it. Next we investigate what, if any, governance arrangements exist to address the issues, paying attention to the policy cycle model.

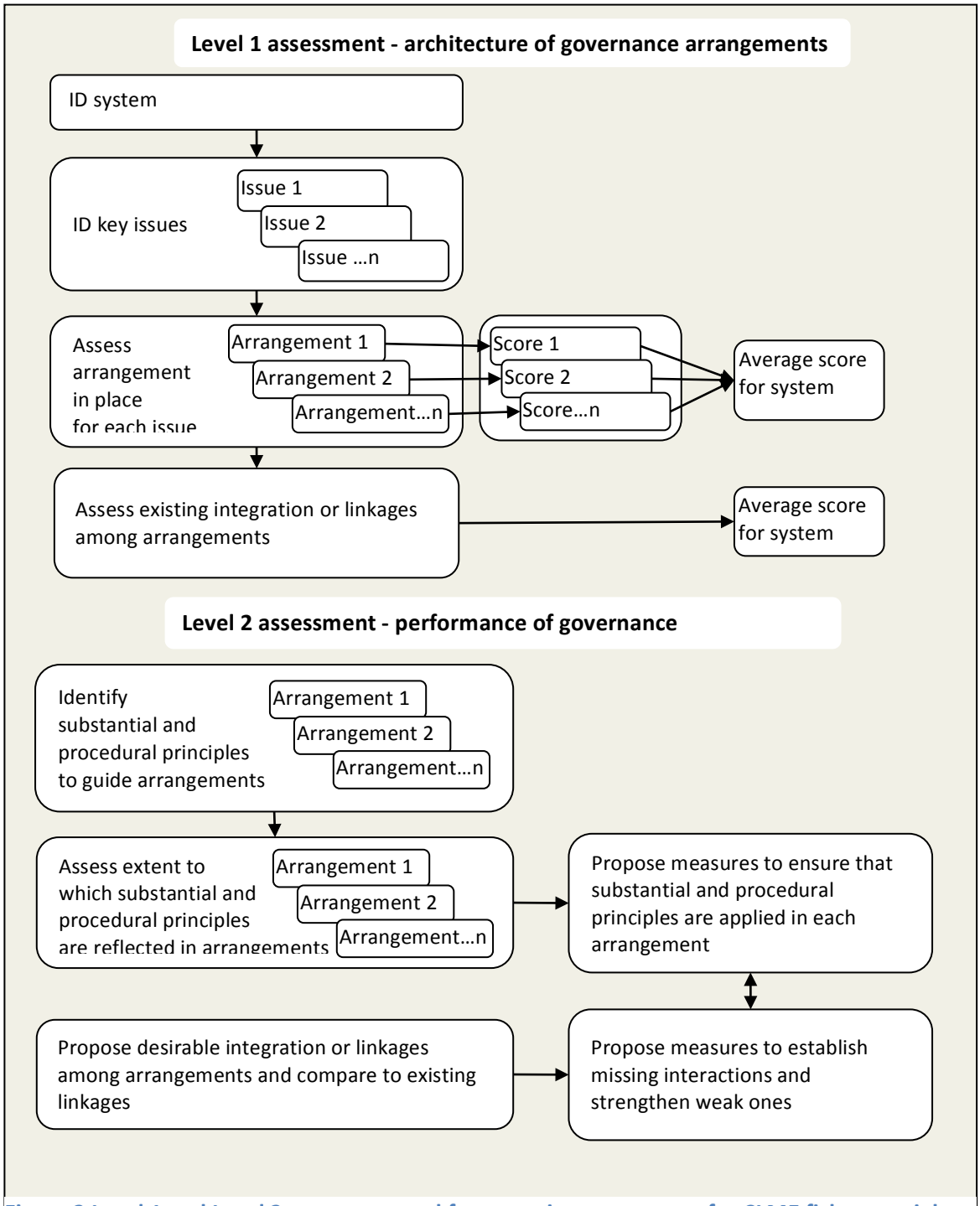


Figure 2 Level 1 and Level 2 processes used for assessing governance for CLME fishery social ecological systems

Where an arrangement addresses several issues or an issue is addressed by several arrangements we look to see if or how arrangements can be integrated for a more complete picture of the structure,

taking the principles of ecosystem-based management into account as well. In Level 2 we use a suite of governance principles to evaluate the actual performance of arrangements.

2.2 The Eastern Caribbean Flyingfish Fishery Case Study

The Caribbean Regional Fisheries Mechanism (CRFM) Secretariat is the implementing agency for the Case Study on Eastern Caribbean Flyingfish (*Hirundichthys affinis*) Fishery. Barbados, Dominica, France (Martinique), Grenada, St. Vincent and the Grenadines, St. Lucia, and Trinidad and Tobago are the listed participating states in the very thorough description of the case study contained in the Report of the First Meeting of the Consultancy Steering Committee on 10 February 2011 in Barbados (CRFM 2011).

The CRFM (2011) explains the overall objectives as:

- the establishment of effective sub-regional governance and management framework
- the implementation of policy cycles based on the precautionary and ecosystem-based management (EBM) principles.

The CRFM (2011) approved proposal states that the immediate objective of the case study is twofold:

- to fill important knowledge gaps that will contribute to the final TDA
- to inform the development of the SAP and the CLME management and governance framework, which will include priority actions for the sustainability of the Eastern Caribbean flyingfish fishery.

The case study is divided into a series of specific TDA and SAP components, some of which are underway while others are finished. Of particular interest to the governance assessment are the components to:

- Undertake a stakeholder analysis, including an assessment of capacity to take part in the sub-regional management process
- Evaluate the existing policy cycles and linkages among the countries involved in the flyingfish fishery and make recommendations to improve them. This will include a review and analysis of existing policy, legal and institutional arrangements and investments for management and governance of flyingfish.
- Convene national meetings with key stakeholders to review the recommendations from the evaluation exercise, including the proposal for a sub-regional decision-making mechanism/forum, and seek their input and support.
- Promote and mobilize the CRFM networking on flyingfish issues through the Small Coastal Pelagic Fisheries Working Group to ensure all recommendations and lessons learnt come from reliable field experiences with solid basis.
- Convene a joint meeting of senior fisheries officials of the CRFM Participating States and the WECAFC Ad Hoc Working Group on Flyingfish in the Eastern Caribbean, with appropriate representation, to review the preliminary outputs and provide further guidance on the activities, including recommendations for the Ministerial Meetings.
- Convene meetings of the CRFM Ministerial Council (Ministers responsible for fisheries of the States interested in the flyingfish fishery) with appropriate Ministerial representation from Martinique to endorse the Regional Declaration and provide policy guidance on the development of the SAP

Implementing these components will provide considerable insight into the current and potential actual dynamics of the governance associated with this sub-regional fishery. There have been other related developments such as the establishment of a CRFM Ministerial Sub-committee on Flyingfish Fisheries at the fifth meeting of the Ministerial Council in Dominica in October 2011. The annotated agenda states:

The Sub-committee will, inter-alia, oversee and supervise the development of governance and management arrangements including a regional declaration, to address cooperative measures for sustainable development, conservation and management of the Flyingfish fishery to ensure the countries of the obtain optimum sustainable social and economic benefits from the resource The Sub-committee will be made up of Member States with a real interest in the Flyingfish fisheries.

At the CRFM Seventh Annual Scientific Meeting in 2011 flyingfish took centre stage in the Small Coastal Pelagic Fish Resource Working Group (SCPWG) to address some TDA activities of this case study. If and how the outputs of CRFM Scientific Meetings get incorporated into policy or management has been a point of discussion in CRFM for some time across all fisheries. This case study is bringing into sharper focus the issues associated with translating fisheries data into management information or policy advice.

Decisions are being taken in other organizations that may also alter flyingfish governance. For example, in November 2011 the WECAFC Scientific Advisory Group (SAG) recommended strengthening the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean (see FAO 1999, 2002 and 2010; WECAFC 2012a) to support the WECAF Commission and CRFM Ministerial Sub-Committee on Flyingfish with scientific and technical advice. The 14th session of WECAFC established the proposed flyingfish joint working group (WECAFC 2012b) and endorsed the group's Terms of Reference to:

- Update and finalize the draft Sub-Regional Fisheries Management Plan for Flyingfish in the Eastern Caribbean, taking into account the need to develop an ecosystem approach to fisheries (EAF) management and climate change issues.
- Establish and commence improved monitoring of fishery performance trends, consistent with agreed management objectives for the operation of the Eastern Caribbean flyingfish fishery.
- Monitor and advise on the implementation of the agreed Fisheries Management Plan.
- Provide advice on the status of the fishery and its management to the CRFM Ministerial Sub-Committee on Eastern Caribbean Flyingfish and to WECAFC.
- Take other necessary actions on emerging issues pertaining to the sustainable use of Eastern Caribbean flyingfish.

The working group met 18-19 June, 2012, in St Vincent and the Grenadines to address the following:

- Updated Subregional Fisheries Management Plan for Flyingfish in the Eastern Caribbean
- Agreed Process for National Consultations
- Agreed list of key management measures
- Draft resolution to be discussed and signed at the next meeting of the CRFM Ministerial sub-committee flyingfish or the CRFM Ministerial Council
- Inter-sessional Work Plan

The sub-regional flyingfish draft management plan was amended and the draft resolution for ministers to consider sought their agreement on the following management measures:

- Per 1 June 2013, establishment of an authorized entry (license/permit) system for flyingfish fisheries, which enters into force for the flyingfish fisheries season 2013/2014.
- Adoption of a sub-regional total annual catch trigger point of 5000 tonnes, at which point action shall be taken to ensure the stock does not become overfished.
- Precautionary introduction of a 2-year sub-regional freeze on expansion of flyingfish fishing capacity.

The draft resolution went further by seeking ministers' agreement that the overall management of the fishery will be greatly improved by the following joint actions:

- improving and harmonizing flyingfish data collection and analysis in the sub-region;
- improving and harmonizing flyingfish vessel licensing and registration in the sub-region;
- establishment of a sub-regional flyingfish catch and effort database to be managed by the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean in cooperation with the CRFM Secretariat;
- establishment of a sub-regional flyingfish vessel registry database to be managed by the CRFM/WECAFC Working Group of Flyingfish in the Eastern Caribbean in cooperation with the CRFM Secretariat;
- formalizing the relationship with Martinique and Guadeloupe to ensure their involvement in the management process as far as the flyingfish fishery in its EEZ are concerned;
- improved control and surveillance of flyingfish fisheries and ending IUU fishing; and
- promotion of fishing access agreements between and among states.

The CRFM Secretariat is also investigating stakeholder views on appropriate sub-regional management objectives. This involves looking at the results of several previous publications on the flyingfish fishery. The early investigations were largely biological and ecological (e.g. Lewis et al 1962) but soon turned to development strategies (Mahon et al 1986) and more comprehensive investigation to facilitate fishery management (Oxenford et al 1993). Much of this has recently been collated (Oxenford et al 2007) and attention is turning to issues of EBM particularly following the results of the FAO Lesser Antilles Pelagic Ecosystem (LAPE) project (Fanning and Oxenford 2011). There is considerable information available that is relevant to policy cycles whether or not governance arrangements are in place.

Policy instruments that do not yet have governance arrangements associated with them will need to be taken into account. These include the CARICOM Common Fisheries Policy and the Castries (St. Lucia) Declaration on Illegal, Unreported, and Unregulated (IUU) Fishing. They indicate agreement, at least in principle, to take action on a collective basis. Implementation of the Castries Declaration on IUU fishing is a priority for another regional project (ACP Fish II) involving CRFM Member States. Bilateral fishing negotiations are similar, but narrower in scope, as the absence of a fishing agreement between Barbados and Trinidad and Tobago has not drawn in the other countries that participate in the fishery and which would be affected by an agreement.

Even as the case study proceeds, other events are unfolding in the region. For example, the recent low catches of flyingfish in the 2011-2012 season may cause stakeholders to pay closer attention to uncertainty, adaptive capacity, self-organisation and resilience in the fishery system that includes transforming fisheries governance.

An earlier draft of this report was presented to and reviewed by participants at the CRFM Regional Validation Workshop on Governance and Management of Flyingfish and Large Pelagic Fisheries, 2- 4 May 2012 in Grenada. Consultant draft reports on existing policy, legal and institutional arrangements for governance and management of flyingfish fisheries (CRFM 2012a) and on stakeholder identification and analysis (CRFM 2012b) were presented at that workshop and subsequently finalized.

In view of the fishery situation not being static this governance assessment is necessarily a snapshot. We expect monitoring and evaluation, which results in learning and adaptation, to be integrated into ongoing efforts for improving fishery governance. In this spirit, the Level 1 and Level 2 assessments offered below are intended primarily to provoke thought and discussion rather than be a thorough diagnosis or offer any remedial prescriptions. Constructive criticism and alternatives are encouraged.

3 Level 1 assessment – architecture

The steps required for the Level 1 assessment were outlined in Figure 2. The outputs of the assessment will be described step-by-step in this section.

3.1 System to be governed

Governance of LMR must be place-based (Crowder et al 2006, Young et al 2007). Coastal states have marine jurisdictions even if these are not always formally agreed upon through negotiation and delimitation. The geographical boundaries of the system, and the countries involved in the particular fishery social-ecological system, must be clearly identified as a basis for determining the issues and arrangements. This applies even to open access fisheries such as for flyingfish in the eastern Caribbean.

In this case study, the area of the fishery's social-ecological system to be governed is determined by the countries participating in the study which closely match the states with real interest in the fishery. These are Barbados, Dominica, France (Martinique), Grenada, St. Vincent and the Grenadines, St. Lucia, and Trinidad and Tobago. The area of combined possible marine jurisdictions is roughly sketched in Figure 3.

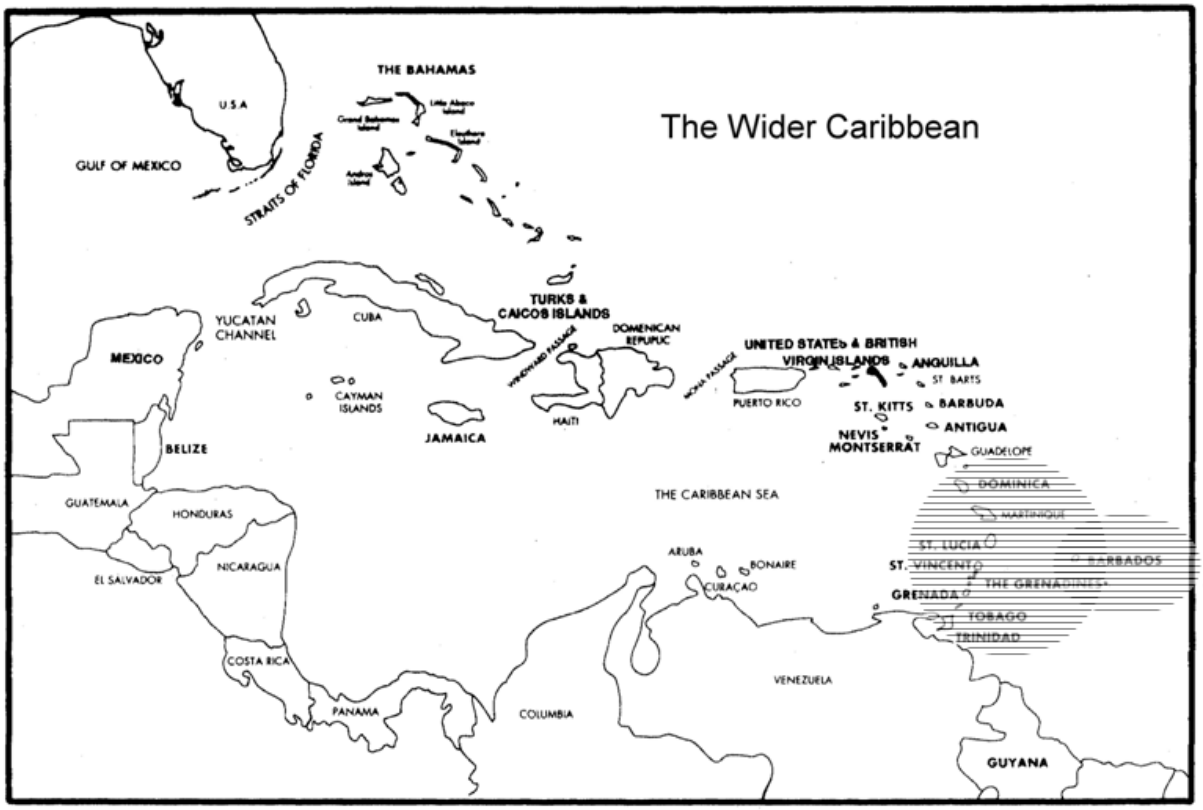


Figure 3 Sketch map of the Eastern Caribbean flyingfish fishery system's approximate boundaries

A few countries outside of this area either have occasional minor food or bait fisheries for this species of flyingfish or may take an interest in its governance with a view to future exploitation. However, they are not a major consideration at present and hence lie outside of the system boundary for the assessment. Both within and outside the system boundary another connection to take into account in ecosystem-based management is the role of flyingfish as prey to larger pelagic predators such as dolphinfish (*Coryphaena hippurus*). This interaction connects fish, fishers and the fishing fleets (Heileman 2011).

3.1 Issues to be governed

The sub-regional Eastern Caribbean flyingfish fishery requires an ecosystem approach to fisheries (EAF) which, for the purpose of this report, is synonymous with EBM (Fanning and Oxenford 2011). This is promoted within the CARICOM Common Fisheries Policy and consistent with current management trends. EAF requires that a comprehensive range of issues relevant to the sustainable use of fishery resources be considered. It is understood that such issues will necessarily be linked or interacting at various points. Issues may need to be combined, or disaggregated into sub-issues in order to match, develop or sustain scales of effective governance arrangements. Ideally, key issues could be agreed upon by the stakeholders in the fishery in an interactive face-to-face session. Where this is not practically possible, as was the case in this fishery, issues can be extracted from the literature and from the experiences of a few knowledgeable informants. Accordingly the following is such a first cut. It is intended that the listing along with the remainder of the assessment be discussed in detail later so as to seek consensus. Note that, since for the purpose of the assessment methodology issues are matters concerning an arrangement, it may be necessary to aggregate detailed issues into a single assessment issue such as "overfishing" or "habitat degradation" since most fishing issues will be addressed by the same arrangement, but this arrangement will differ from the habitat governance arrangement. This is intended to reduce unnecessary redundancy and overlap in the assessment that would otherwise result in several or all detailed fishing issues producing uninformative identical assessment results.

The matters identified as prominent detailed issues for the governance of the Eastern Caribbean flyingfish fishery from an EBM perspective are in Table 1 below with references as to the sources of the identification. The criterion used in this first round for deciding whether a matter is a detailed issue or not rests mainly on the matter being a shared concern that requires a policy process because it directly affects a multitude of factors, and not one that is quite narrow and mostly technical/scientific in nature. For example, there is a long list of unanswered research questions on the ecology and management of the flyingfish (see Oxenford et al 2007:266) , but for the purpose of being considered an issue here these are grouped under the topic of management information under conditions of uncertainty rather than list each one individually. The best available information suggests that overfishing is not occurring.

Table 1 Eastern Caribbean flyingfish issues and related sources of information

Issue identified in the Eastern Caribbean flyingfish fishery	Source of information
Illegal, unreported and unregulated (IUU) fishing is widespread	Participants at 10th CRFM Forum
Uncertainty with fishery ecology and management information	Participants at 10th CRFM Forum
Impacts of climate change and variability on entire fish chain	Participants at 10th CRFM Forum
Fishing gear and methods that primarily target spawning fish	Fanning and Oxenford (2011)
Bait and target interactions with the fisheries for large pelagics	Fanning and Oxenford (2011)
Optimisation of postharvest processing, marketing and distribution	FAO (2010)
Agreement on an appropriate regional yield (target reference point)	Oxenford et al (2007)
Access to the resource by countries participating in the fishery	Oxenford et al (2007)
Allocation of yield among the countries participating in the fishery	Oxenford et al (2007)
Appropriate management tools for achieving target allocations	Oxenford et al (2007)
Mechanisms for verifying adherence to allocations or other rules	Oxenford et al (2007)

For further information on the detailed issues the reader is guided to the source reference material. It is necessary to group the issues, all of which concern the fisheries governance arrangement. Resource sharing is the key issue, combining allocation, access and IUU fishing as the major detailed issues.

What is missing? According to our criteria there should be little else of major importance since the longer lists of issues (e.g. in Oxenford et al 2007 and FAO 2010) are included here. Issues related to pollution and habitat degradation, which are the other major CLME TDA categories besides overfishing, do not apply strongly to the Eastern Caribbean flyingfish fishery. Climate change is treated as a cross-cutting detailed issue. The intersectoral and other aspects of EBM are partially embedded in the above, but may need to be examined more closely at a later stage.

3.2 Identify arrangements for each issue

The assessment of completeness of an arrangement for an issue (Table 2) is based upon whether there are organizations with responsibility for the various stages of the policy cycle for that issue. The columns showing responsible agencies or bodies in Table 3 were filled based on information in the literature and the experience of the CERMES consultants. The scoring takes into account, to a certain extent, the very recent and still ongoing establishment of governance for flyingfish fisheries. However, where a body exists with the potential or mandate to perform a function, but has not demonstrated any evidence of this to date, the completeness receives a zero in order to accurately reflect the state of the current structure. This differs from evaluating the performance of arrangements done in Level 2 of the governance assessment. It says that structurally the body is basically invisible. We examine issues using a model basic policy-cycle (Figure 4). However, the assessment process recognises that the policy cycle must have functionality for two aspects: (1) policy making and (2) management planning. These are sometimes the responsibility of different organisations (Fanning et al in prep., Figure 1). Thus Table 3 allows for both levels.

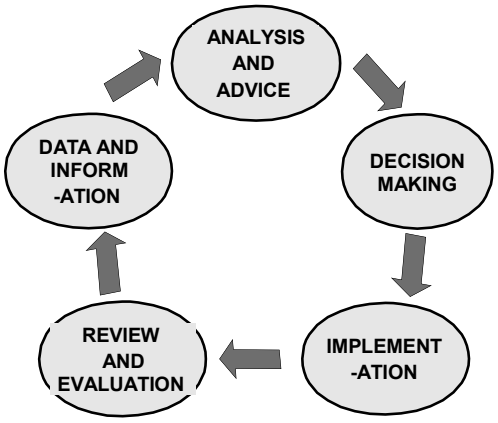


Figure 4 Model basic policy cycle used for governance assessment

We present the tables in sequence below, but note that after the left half of Table 2 is initially filled in, then Table 3 must be filled in before the right half can be completed. Table 3 provides the data for insertion into the columns of completeness and priority. The table notes describe the contents in more detail. A summary discussion follows.

The term "CRFM/WECAFC" is used to label the governance arrangement that involves all of the organisations and components of the CRFM (some readers may be accustomed to using 'CRFM' as shorthand to mean the Secretariat rather than the entire governance structure) as well as WECAFC. This governance structure includes events and groups that are more customary than legal such as the CRFM annual Scientific Meetings and several working groups as well as the WECAFC Scientific Advisory Group.

Table 2 Eastern Caribbean flyingfish fishery ecosystem governance architecture - System summary

IW category: LME	Countries: Six (Barbados, Dominica, Grenada, St. Vincent and the Grenadines, St. Lucia, and Trinidad and Tobago) and potentially France [Martinique]		System name: Eastern Caribbean flyingfish fishery		Region: Eastern Caribbean
Complete these columns then assess issues using the arrangements tables			*After completing the arrangements tables, complete these columns*		
Trans-boundary issue[2]	Number of countries involved[3]	Collective importance for countries involved[4]	Completeness of governance arrangement[5] % (category)	Priority for intervention to improve governance[6]	Observations[7]
Resource sharing (allocation, access and IUU fishing)	6	3	43% (2)	6	Significant problem both in reports and in practice, engaging both governmental and industry stakeholders' attention to seek solutions
	System architecture completeness index[8] >>		43%	6	<< System priority for intervention[8]

Table notes:

[1] This page provides an overview of all the arrangements in the system and their status.

[2] There is the question of how far down in detail these should go. This can be a matter of choice, and part of the flexibility of the system, but it should ideally be to the level where the transboundary issue requires a separate arrangement for management. To use a fishery example, individual species or groups of species may each require their own assessment and measures, but may all be handled in one institutional arrangement. However, for geopolitical reasons, some species or groups of species may require separate processes and should be treated as separate issues needing separate arrangements. Ideally, these issues should be identified and quantified in a TDA. If not, experts knowledgeable about the system may have to identify them.

[3] Indicates how many of the total number of countries are involved in the particular issue.

[4] This should be based on the TDA but may have to be based on expert judgement, or other sources of regional information. It is to be scored from 0-3.

[5] The percentage given in this column is derived from the completeness scores allocated on the arrangement specific page (see Tables). This score will then be reallocated into a category where none = 3, low [1-7] = 2, medium [8-14] = 1 and high [15-21] = 0) for input into the Priority for intervention column. The reason for reversing the score is that the higher the completeness, the less the need for intervention.

[6] This priority would be calculated as the product of the 'collective importance for countries involved' for the issue and 'completeness of governance arrangement'category. It can range from 0-9.

[7] This provides the opportunity for brief comments that may help the user interpret the information provided on the summary page, but is not intended to be a substitute for annotation.

[8] Average.

It does not matter at which stage in the policy cycle the assessment starts. Some may find it more intuitive to start with 'data and information' stage at the bottom as the first row to be filled in while others may prefer another starting point.

Table 3 Eastern Caribbean flyingfish fishery – Assessment for issue of resource sharing (allocation, access and IUU fishing)

Issue: Resource sharing (allocation, access and IUU fishing)				
Policy cycle stage[1] (governance function)	**Responsible organisation or body[2]**	**Scale level or levels[3]**	**Complete-ness[4]**	**Observations[5]**
Policy analysis and advice	CRFM Caribbean Fisheries Forum, CRFM Ministerial Sub-committee on Flyingfish, WECAFC working groups and Scientific Advisory Group	subregional	1	Some of the bodies are untested or very recent
Policy decision-making	CRFM Ministerial Sub-committee on Flyingfish, CRFM Ministerial Council, COTED of CARICOM, WECAFC	sub-regional	1	Some of the bodies are untested or very recent
Planning analysis and advice	CRFM Scientific Meeting [inc. Small Coastal Pelagic Fish Resource Working Group (SCPWG), Working Group on Data, Methods and Training (DMTWG)], CRFM/WECAFC Working Group on Flyingfish, maritime administrations, OECS Secretariat, Foreign Affairs and Legal Affairs ministries, CDEMA, CCCCC	national, subregional, and extra-regional	2	Assessments are done at the sub-regional scientific meeting and advice is offered. But there are few examples of national level policy and management decisions taken as an outcome
Planning decision-making	CRFM Caribbean Fisheries Forum, Fisheries authorities, fisher groups, university, other research agencies, CRFM Secretariat	national, subregional	1	None at subregional level in the absence of an operational regional fisheries managemet plan, but steps are being taken
Implementation	Fisheries authorities, fisher groups, university, other research agencies, CRFM Secretariat, Coast Guards	national, subregional	1	No arrangement in place for transboundary management but prerequisites are in place
Review and evaluation	CRFM/WECAFC Working Group on Flyingfish, CRFM Scientific Meeting, CRFM Secretariat, CRFM Caribbean Fisheries Forum, CRFM Ministerial Sub-committee on Flyingfish	national, subregional	1	No arrangement in place for transboundary management but prerequisites are in place
Data and information	Fisheries authorities, fisher groups, NGOs, university & other research agencies, international agencies	national, subregional, and extra-regional	2	Data collections systems are in place but they yield data of variable quality and quantity
	Overall total[6] and % completeness >>>		9/21 =43%	

Arrangements by issue table notes (applies to Table 3)
1. This column lists the governance functions that are considered to be necessary at two levels: (1) the meta-level of policy preparation and setting; and (2) the policy cycle level as per Figure 3.
2. The organisation or organisations responsible for the function should be listed here
3. These are the level or levels on the jurisdictional scale at which the function is performed. There are five levels on the scale of jurisdiction: local, national, sub-regional, regional, and extra-regional.
4. Rate on a scale of 0 = absent, 1 = low (ad hoc, irregular, unsupported by formal documentation or little known by stakeholders), 2 = medium, 3 = high (clearly identifiable, regular, documented or supported by policy and legislation and widely known among stakeholders)
5. This provides the opportunity for brief comments that may help the user interpret the information provided, but is not intended to be a substitute for annotation.
6. Assume each step is equally important and receives equal weighting for the completeness overall.

3.3 Summary of findings

Table 2 shows an overall completeness score of 43% for the issue of resource sharing with a priority for intervention of 6 for the fishery system. Observations suggest that the CRFM potentially has structures that can make a difference, but whether or not they actually do so depends upon a host of both internal and external factors. Allocation and especially access were among the most controversial topics during the negotiation of the CARICOM Common Fisheries Policy. They created an impasse that resulted in a decision to remove them substantially from the text pending subsequent negotiation of these areas as protocols. Due to the perceived sensitivity of IUU fishing and lack of hard evidence on the interactions among fleets at sea or in terms of the bait fisheries, these matters have no active arrangement although the potential exists for them to be addressed. Operationalisation of the Castries (St. Lucia) Declaration on Illegal, Unreported, and Unregulated (IUU) Fishing may make a significant difference. There is not yet sufficient legal-institutional and administrative machinery to operationalise the mandates suggested by the agreement establishing the CRFM, other agreements and the terms of reference of the bodies (CRFM 2012a). Although climate change is sometimes stated as a priority area for attention and action in fisheries there is little evidence to date of the latter at present. Lack of 'political will' may also be an issue, but this is a complex deficiency comprising dysfunctions that range from the truly technical (e.g. information available) to the purely political (e.g. power dynamics).

Table 3 identifies bodies with responsibility for governance with regard to the issue being considered. This is primarily the formal arena of governance. However, governance as understood in the CLME Project includes the interactions of all the actors with interests in governance outcomes. This is also reflected in the CRFM mission where engagement of stakeholders, and especially resource users, is identified as necessary for the successful implementation of sustainable fisheries management. In order to understand and assess governance processes the roles of and interactions among these actors must be considered. This requires identification of the actors and their roles with reference to the policy cycle. It also provides the opportunity to identify where partnerships exist and/or can be developed. The full identification of all stakeholders is beyond the scope of this assessment of governance architecture and arrangements. However, a table in which the stakeholders can be identified is set up in Appendix 1 for future use. The stakeholder analysis (CRFM 2012b) commissioned by the CRFM Secretariat as a case study activity cannot, however, easily be used to fill in the table and develop useful practical detail since it does not use the policy cycle as the basis for the analysis. This task still needs to be done.

The completeness of the policy cycle stage for the issue in Table 3 is summarized in Figure 5. The latter illustrates the modest level of completeness for the issue by policy cycle stage. The policy cycle is not well completed based on the available information from the literature and knowledgeable informants. If the assessment could be conducted with at least the government, harvest and postharvest stakeholders

as anticipated in Appendix 1, it may show variation in rating among stakeholders and offer reasons for variation. The newly established Ministerial Sub-committee on Flyingfish is an interesting development that may significantly improve governance, especially at policy level, if it achieves its potential.

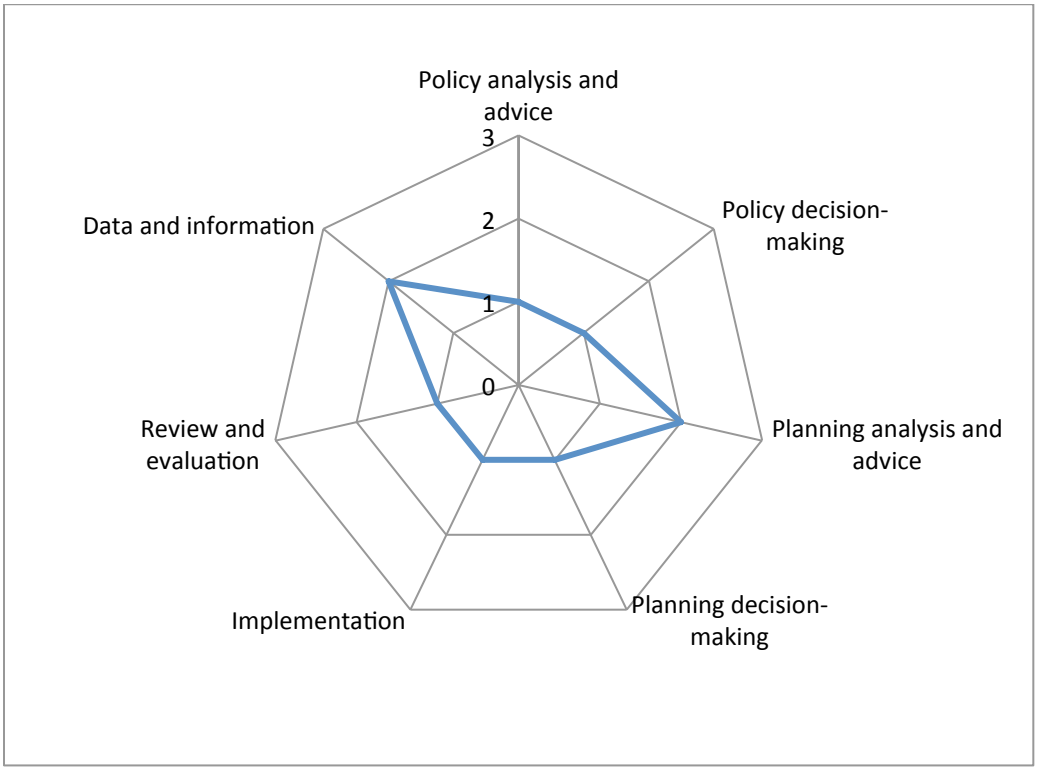


Figure 5 Completeness scores for issue by policy cycle stage

Key: 0=absent; 1=low; 2= medium; 3= high level of completeness

3.4 Integration and linking of arrangements

An assessment of integration would be based on the extent to which issue specific arrangements in a system share a responsible body at various policy cycle levels. The information on responsibility for policy cycle stages from Table 3 would be used to measure the degree of overlap of responsibility among issues. This does not apply in this case of a single issue, and where the Eastern Caribbean flyingfish fishery is primarily a CRFM and WECAFC matter, subject to the mode of involvement of France (Martinique). The eventual operationalisation of instruments such as the IUU Declaration and the CARICOM Common Fisheries Policy may alter the governance arrangements for this fishery.

4 Level 2 assessment - performance of governance arrangements

The Level 2 assessment evaluates the functionality and performance of governance arrangements according to criteria agreed upon by stakeholders. Mahon et al (2010) provide the conceptual background to a process for examining governance arrangements in transboundary water systems.

4.1 Principles for assessment

The principles that should guide the establishment and the functioning of a governance arrangement, and the extent to which they are being observed in the processes, are an important part of a governance

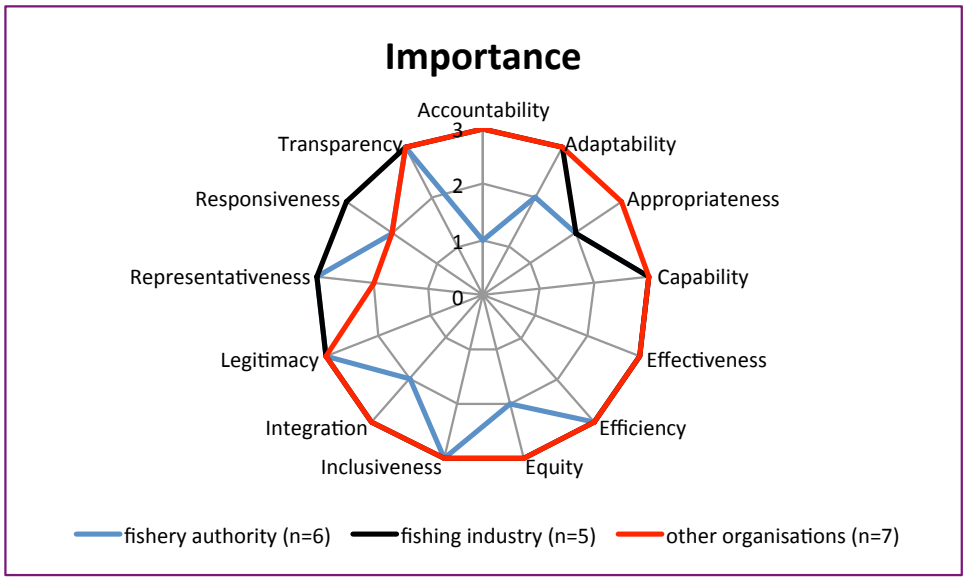
assessment. Assessing them can provide very practical insight into where the systems need the most attention. Key end product principles are: sustainability, efficiency, rationality, inclusiveness, equity, precaution and responsiveness. In order to reach these ends, process principles include: transparency, accountability, comprehensiveness, participation, representativeness, information and empowerment. Processes and products are linked and overlap. Table 4 sets out a suite of 13 principles used for the fishery governance assessment.

Table 4 Principles to be assessed and the statements that can be used to assess them

Principle	Statement
Accountability	The persons/agencies responsible for the governance processes can be held responsible for their action/inaction
Adaptability	The process has ways of learning from its experiences and changing what it does
Appropriateness	Under normal conditions, this process seems like the right one for what it is trying to achieve
Capability	The human and financial resources needed for the process meet its responsibility are available.
Effectiveness	This process should succeed in leading to sustainable use of ecosystem resources and/or control harmful practices
Efficiency	This process makes good use of the money, time and human resources available and does not waste them.
Equity	Benefits and burdens that arise from this process are shared fairly, but not necessarily equally, among stakeholders
Inclusiveness	All those who will be affected by this process also have a say in how it works and are not excluded for any reason.
Integration	This process is well connected and coordinated with other related processes.
Legitimacy	The majority of people affected by this process see it as correct and support it, including the authority of leaders
Representativeness	The people involved in this process are accepted by all as being able to speak on behalf of the groups they represent
Responsiveness	When circumstances change this process can respond to the changes in what most think is a reasonable period of time
Transparency	The way that this process works and its outcomes are clearly known to stakeholders through information sharing

4.2 Assessment of performance

A participatory performance assessment was undertaken at the Second Meeting of the CRFM/CLME Eastern Caribbean Flyingfish Fishery Case Study Committee held in Dominica on 11 March 2013. After an explanation of the process and confirmation that the principles were understood, the participants were divided into three groups: fishing industry, fisheries authority and other (mainly regional and international organisations). Each stakeholder group was asked to provide scores for the governance arrangement using the 13 principles. This was based on the extent to which they agreed or disagreed with the statement associated with the principle in Table 4. Response categories were: disagree strongly = 1, disagree =2, agree = 3, agree strongly = 4. They were also asked to indicate the importance of the principle for the particular issue on the scale: 0 = none, 1 = low, 2 = medium, 3 = high. The results for both are shown in Figure 6.



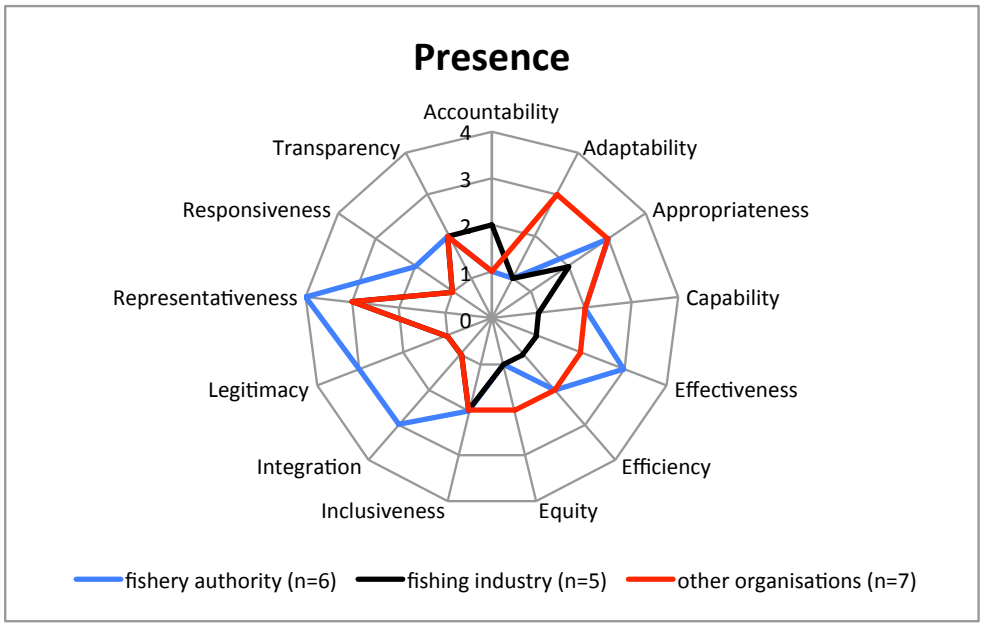


Figure 6 The importance and presence of the performance principles in the flyingfish arrangement

Figure 6 shows that most principles were considered to be of medium to high importance by the three groups. Only accountability received a low score from the fishery authority participants. All groups took into account the newness of the flyingfish governance arrangement and this largely explains the fairly low scores in measuring the presence of the principles in current performance. Indeed not all parts of the flyingfish arrangement have been fully tested. The group of other organisations also noted that not all principles needed to be present at the highest level for performance to be credible. The diagram on presence suggests that the fishery authority participants were generally more satisfied with the level of performance at presence than the industry participants. At this early stage in the arrangement it may mainly signal the need for communication so that all stakeholders are kept fully informed at all times.

This general observation provides the opportunity to reflect on what might be done differently in order to improve the arrangement. Stakeholders could be questioned on what they would like to see changed or implemented in order for performance principles to be improved. Functional linkages and interaction within governance arrangements are critical components of the governance system. Sound architecture is a necessary, but not sufficient, condition for the integration required for an ecosystem approach to fisheries. In a few years, and rounds of the policy cycles, the level 2 assessment of flyingfish should be much more informative.

5 Conclusions and recommendations

Assessments of governance architecture, such as the one carried out for this case study, are few. The purpose of the assessment carried out here is to measure and visualise the governance arrangement for the issue identified for the eastern Caribbean flyingfish fishery in order to facilitate discussion among stakeholders. This discussion can lead to shared interest in what should be in place, what principles should be prominent and how the system should be structured. The assessment is not intended to lead to a prescriptive output regarding what should be in place. Nonetheless, some broad observations can be made on aspects of the system that need attention if arrangements are to be structured in a way that is likely to lead to good governance, including the promotion of intersectoral and inter-issue integration that is needed for an ecosystem approach to fisheries.

The major observation is that there is an urgent need to formalize and/or operationalise the CRFM's governance arrangements for the issue (addressing Level 1), and by making them known and more open to all stakeholders to take part in the processes effectively facilitate improved performance (helps to address Level 2). Although more can be read into the results, the assessment has not been particularly participatory given the cost and difficulty of bringing representatives of the countries and the key agencies together in one location.

We recommend that strengthening the governance arrangement for Eastern Caribbean flyingfish be included in the SAP, including linkages to the regional arrangements for pollution and potentially other issues through EAF. This requires that the SAP set out to:

- Fully activate the CRFM/WECAFC Working Group on Flyingfish in the Eastern Caribbean by securing the active participation of all seven members
- Fully operationalise the CRFM Ministerial Sub-Committee on Flyingfish for policy decision-making to
  - Develop and implement an EAF plan for Eastern Caribbean flyingfish
  - Implement selected key EAF activities

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Appendix 1: Suggested table for scoring the completeness of policy cycle stages for the five governance issues by country and stakeholder group

A table can be filled in for each of the five issues below and others can be added.

1. Ignorance and uncertainty
2. Impacts of climate change
3. Allocation and access agreements
4. IUU and fisheries interactions
5. Postharvest arrangements

The three stakeholder groups suggested can be further sub-divided and others added as informed by the stakeholder analysis (a component of the case study for which CRFM Secretariat has contracted a consultant). The process can be a compilation of results from national consultations although a more collective and interactive process of sub-regional consultation may be possible by engaging government representatives knowledgeable about this fishery while they are attending CRFM or other meetings.

Issue:																										
Policy cycle stage	**Barba-dos**			**Domi-nica**			**France (Martin-ique)**			**Gren-ada**			**St. Vincent and the Grena-dines**			**St. Lucia**			**Trini-dad and Toba-go**			**Overall**		
Stakeholder group GOV=government HAR=harvest sector POS=postharvest	GOV	HAR	POS	GOV	HAR	POS	GOV	HAR	POS	GOV	HAR	POS	GOV	HAR	POS	GOV	HAR	POS	GOV	HAR	POS	GOV	HAR	POS		
Policy analysis and advice																										
Policy decision-making																										
Planning analysis and advice																										
Planning decision-making																										
Implementation																										
Review and evaluation																										
Data and information																										

Appendix 2. Suggested table for identification of stakeholders by issue

In Appendix 1 it was recognised that stakeholders may need to be broken down into finer groups than government, harvest and postharvest sectors. Indeed further disaggregation is useful for understanding the policy cycles and institutional relationships especially in the Level 2 analysis. This information will be supplied by the stakeholder analysis (a component of the case study for which CRFM Secretariat has contracted a consultant).

Issue		
Policy cycle stage (governance function)	**Regional stakeholders**	**National/local stakeholders**
Policy analysis and advice		
Policy decision-making		
Planning analysis and advice		
Planning decision-making		
Implementation		
Review and evaluation		
Data and information		