Food and Agriculture Organization of the United Nations

Disaster risk management and climate change adaptation in the CARICOM and wider Caribbean region

Programme proposals

Cover photograph:
Lost beach boat. Courtesy of Patrick McConney, Centre for Resource Management and Environmental Studies (CERMES), Barbados.

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Patrick McConney
Senior Lecturer
Centre for Resource Management and Environmental Studies (CERMES)
University of the West Indies, Cave Hill Campus, Barbados

John D. Charlery
Lecturer
University of the West Indies, Barbados

Maria Pena
Project Assistant
Centre for Resource Management and Environmental Studies (CERMES)
University of the West Indies, Barbados

Terrence Philips
Programme Manager
Fisheries Management and Development
CRFM Secretariat, Barbados

Raymon Van Anrooy
Fishery and Aquaculture Officer / Secretary of WECAFC
Food and Agriculture Organization of the UN
Sub-regional Office for the Caribbean (FAO-SLC)

Florence Poulain
Fisheries and Aquaculture Officer
Disaster Risk Management Coordination
Fisheries and Aquaculture Department
Rome, Italy

Tarub Bahri
Fishery Resource Officer
Food and Agriculture Organization of the United Nations
Rome, Italy

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ABBREVIATIONS AND ACRONYMS

ACP	African, Caribbean and Pacific Group of States
CANARI	Caribbean Natural Resources Institute
CARICOM	Caribbean Community
CAS	complex adaptive system
CBO	Community-based organization
CCA	climate change adaptation
CCCFP	Caribbean Community Common Fisheries Policy
CCCCC	Caribbean Community Climate Change Centre
CDEMA	Caribbean Disaster and Emergency Management Agency
CDM	comprehensive disaster management
CI	Conservation International
CLME	Caribbean Large Marine Ecosystem (Project)
CFRAMP	CARICOM Fisheries Resource Assessment and Management Program
CRFM	Caribbean Regional Fisheries Mechanism
DRM	disaster risk management
EAA	Ecosystem approach to aquaculture
EAF	ecosystem approach to fisheries
EBM	Ecosystem-based management
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Federal Enterprise for International Cooperation)
ICM	integrated coastal management
IGO	intergovernmental organization
IP	Implementation Plan
NGO	Non-governmental organization
OECS	Organization of Eastern Caribbean States
RBM	results-based programme planning and management
SES	social-ecological system
SIDS	small island developing States
TNC	The Nature Conservancy
USAID	United States Agency for International Development
UWI	University of the West Indies
VMS	vessel monitoring system
WECAFC	Western Central Atlantic Fishery Commission
WWF	World Wide Fund for Nature

SUMMARY

This report is the third of four outputs in an initiative of the Caribbean Regional Fisheries Mechanism (CRFM) and the Food and Agriculture Organization of the United Nations (FAO) on "Climate change adaptation and disaster risk management in fisheries and aquaculture in the CARICOM and wider Caribbean region". The aim is to develop a programme for funding projects set out in the strategy and action plan (Volume 2).

This programme proposal is very much a work in progress, to be discussed and developed further. The programme proposal requires ownership and leadership to transform the ideas presented here – or the alternatives offered – into action. A key indicator of success is the extent to which the proposed programme (with any changes) is agreed to and implemented by various stakeholders. In an effort to ensure that most stakeholders are able to participate and benefit, the programme covers a wide array of interests and actors consistent with the social-ecological system and livelihood models introduced. The proposal encourages networks for implementation and learning in order to make best use of available capacity. It advocates a multilevel approach with small and large initiatives yielding both short-term and longer-term successes, and it is intended to assist the Implementation Plan (IP) of CARICOM's Regional Framework for Achieving Development Resilient to Climate Change to deliver "transformational change" between 2011 and 2021. The proposal incorporates obligations and principles contained in global and regional instruments on climate, disasters, fisheries and aquaculture.

Proposals are set out in the format of the logical framework used by many technical and funding agencies within and beyond the CARICOM region. Limitations are acknowledged in terms of making these proposals ahead of CRFM countries and other interested parties agreeing upon the situation assessment and the strategy and action plan. Suggestions are made on how to mobilize resources for mainstreaming climate change adaptation and disaster risk management into fisheries and aquaculture, bearing in mind that project financing strategies need to be flexible and that funding criteria and conditions can change at short notice.

McConney, P., Charlery, J., Pena, M., Phillips, T., Van Anrooy, R., Poulain, F., Bahri, T. 2015.
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1. INTRODUCTION

The terms of reference of this consultancy call for a results-based programme proposal with supporting project concept notes on implementation and resource mobilization. This introduction explains what this means conceptually and in practical terms. We also identify limitations. The sections that follow propose a programme that focuses on the Caribbean Regional Fisheries Mechanism (CRFM – the entire Mechanism, not just the Secretariat) taking the lead in association with partner agencies.

1.1 CONTEXT

This volume is very much a work in progress, to be discussed and developed further. The programme proposal requires ownership and leadership to transform the ideas here – or the alternatives offered – into action. A key indicator of success is the extent to which the proposed programme (with any changes) is agreed to and actually implemented by various stakeholders. In an effort to ensure that most stakeholders are able to participate and benefit, the programme covers a wide array of interests and actors consistent with the social-ecological system (SES) and livelihood models introduced. The proposal encourages networks for implementation and learning in order to make best use of available capacity. It advocates a multilevel approach with small and large initiatives yielding both short-term and longer-term results.

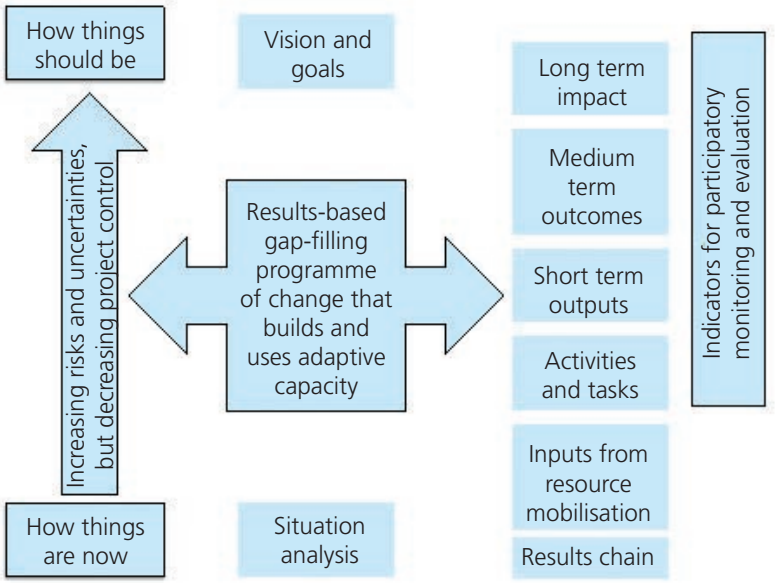
1.2 CONCEPTS

Most readers who work with or for donors, intergovernmental organizations (IGOs), non-governmental organizations (NGOs), community-based organizations (CBOs) and some private sector bodies will be familiar with results-based programme planning and management (commonly shortened to RBM) and its components, even if they know these processes by different names. International (e.g. Food and Agriculture Organization of the United Nations [FAO]) and regional (e.g. Caribbean Disaster and Emergency Management Agency [CDEMA]) development-oriented organizations favour RBM. Its basics have been used for decades (e.g. the logical framework or logframe) but recent approaches (e.g. outcome mapping) are even more consistent with complex adaptive systems and resilience thinking. We explain RBM core elements minimally because there are abundant online resources that describe its many variations. Our aims are to illustrate that RBM fits well into how the Caribbean Community (CARICOM) region is prepared to address climate change adaptation (CCA) and disaster risk management (DRM), and to facilitate readers' understanding of the proposed programme.

This proposal is at the planning and programming stage of RBM, and a key requirement is to understand the current situation (from the assessment study and many other sources, for example) and to have a vision for the future (such as that provided by the Regional Framework for Achieving Development Resilient to Climate Change and for comprehensive disaster management [CDM]). The RBM programme is intended to fill the gaps between these as illustrated by the results chain that takes into account the attendant risks and assumptions. An element that is often overlooked, but which is critical to such schemes, is that beneficial outcomes and impacts may occur as a result of entirely external factors. They are part of the uncertainty in the system. Although these benefits cannot be attributed to project activities and interventions, they cannot be excluded in measuring the achievement of desired change.

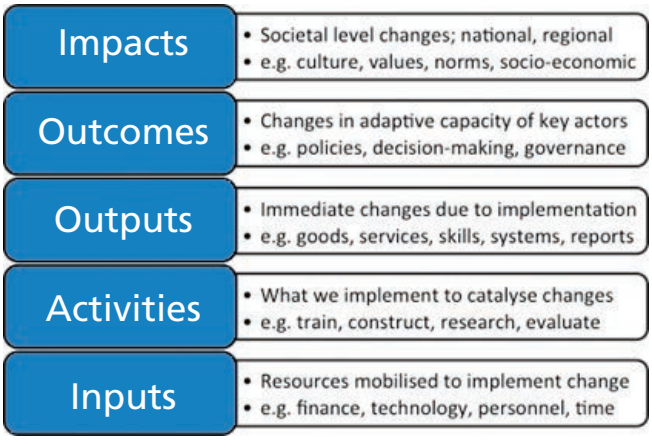
A good example would be the benefits that accrue to fisheries and fish farmers as a result of the introduction of an ecosystem approach to integrated coastal management (ICM), or sustainable tourism opportunities that originate from a separate initiative. In order to measure success, and keep on track, the results chain features (participatory) monitoring and evaluation using indicators and means of verification. As with strategic planning generally, it may take several results chains to converge upon and accomplish the shared vision. A central tenet of RBM is the emphasis on achieving change rather than merely action. The aim of the Implementation Plan (IP) for the Regional Framework is to deliver transformation. Figure 1 summarizes these concepts. We advise readers not to become caught up in the definition of terms or small differences between various RBM schemes.

FIGURE 1
Key concepts in results-based management and programming



The results chain is equivalent to a scale of development components comprising several levels and is similar to the scale and cross-scale analyses of complex adaptive systems (CASs) and SESs. What is expected at each level should be clear. Figure 2 provides some examples.

FIGURE 2
The levels of the results chain



1.3 APPROACH

There are several ways to set out and summarize programmes for RBM. The most common, used in RBM and other schemes, is the logical framework or logframe that many funding and development institutions require for project proposals. There are fewer variations of the logframe than there are of RBM and there is an abundance of online information on logframes; many readers may be familiar with them. The programme proposal uses the logframe to communicate concisely what is intended. Figure 3 illustrates a generic layout of a logframe.

FIGURE 3
Logical framework used for programme proposal

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact			
Outcomes			
Outputs			
Activities	Resource mobilisation		
Inputs			

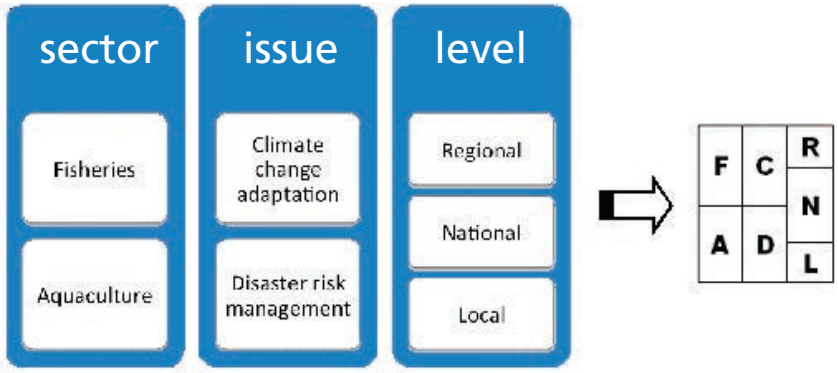
Examining the columns from left to right, the results chain statements are in the first column. In order to achieve synergy and linkages, these are taken or derived – particularly at the outcome and impact levels – from existing initiatives or recommendations (such as from the four country consultations) to the extent possible. Next are the columns of performance indicators and means of verification. At this stage, it is not intended to develop these fully. Suites of indicators are now commonplace. Once the results chain is agreed upon, the interested parties can identify and adopt or adapt suitable indicators from systems already in place or planned. For example, the Caribbean Large Marine Ecosystem (CLME) Project is developing an indicator-based information management system for the entire wider Caribbean region that should incorporate many fisheries metrics. The programme proposal recognizes such opportunities without going into premature detail. The final column contains risks and assumptions. In logframe convention, risks are negative (constraining conditions) and assumptions are positive (enabling conditions), but both are beyond the control of the project. Again, these receive only a light touch at this stage. Some may depend upon the countries and agencies that decide to participate in various aspects of the projects given the relationship of risks and assumptions to agency and capacity. Resource mobilization is summarized at the bottom of each table. This summary means of communication should allow quick and efficient analysis of options with easy editing to reflect final decisions. Explanatory concept notes are added where necessary to provide further information or references to sources.

This undertaking covers 17 countries, 4 topic areas (aquaculture, fisheries, CCA and DRM) and 3 jurisdictional levels (local, national and regional) that set the scope of proposed programmes. Although collaboration and integration are central themes, none of the programmes will cover all of these dimensions. It would be inappropriate to set out the countries and agencies that should participate in specific programmes,

although we may recommend arrangements that seem beneficial. Participation is left for expressions of interest and negotiation at the regional workshop and beyond. For the topic areas and levels, each proposal is accompanied by a small matrix that sets out the thinking at this stage (Figure 4). The cells are shaded to reflect the scope. It provides an additional scheme for determining the overall coverage of the programme to ensure that it is as equitable as parties deem necessary.

Within the programme, most local initiatives can be scaled up and regional initiatives can be scaled down. The suggestion of level is mainly to indicate where capacity and results are most congruent for greatest impact in the shortest period. Although some proposals are predominantly either CCA or DRM, most are integrated in keeping with the model and aim of increasing convergence. Proposals are selected from the recommended measures listed in the assessment study.

FIGURE 4
Scope matrix and miniature



2. LIMITATIONS

The following limitations are acknowledged at this preliminary stage in programme proposal creation.

- Countries will need to consider and negotiate participation in proposals, taking into account their capacity (at all levels) to fully engage and benefit simultaneously with other initiatives.
- Some countries may be overwhelmed by current and planned initiatives, necessitating their engagement on an incremental and phased basis, carefully planned to fill gaps, not to duplicate efforts.
- The number of relevant initiatives by a host of Caribbean and extraregional agencies appears to be increasing without much pattern, so environmental scans will be necessary.
- Sources of funding and other resources change strategic direction and criteria for assistance without notice, so close attention must be paid to these threats or opportunities.
- Participants in the four country consultations made it clear that their core constraints lay mainly in problematic governance institutional arrangements not specific to CCA and DRM.
- Configuration and content of proposals change with the number and capacities of participants, so considerable revision will need to be done once countries and agencies express interest.

The above limitations are not confined to this initiative, but affect almost any with an undefined long-term planning horizon. A ten-year timeline is suggested, but what is practical may depend more on planning, programming and electoral cycles in the CRFM countries and some funding agencies.

3. RESOURCE MOBILIZATION

One view of resource mobilization is that it is "a management process that involves identifying people who share the same values as your organization, and taking steps to manage that relationship"[1]. This perspective, going beyond fundraising and project financing, is particularly pertinent to this programme proposal, which is expected to rely on partnerships and networks to a large extent, consistent with SES and resilience. The same authors go on to describe resource mobilization as a process that involves three integrated concepts guided by a number of principles. The concepts are:

- organizational management and development;
- communicating and prospecting;
- relationship building.

The main partners in this initiative (FAO, CRFM, Caribbean Community Climate Change Centre [CCCCC] and CDEMA), as major intergovernmental organizations, have resource mobilization strategies for their programmes of work, as will the major funding sources (e.g. United States Agency for International Development [USAID], Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ], Global Environment Facility [GEF]) and large international NGOs (e.g. The Nature Conservancy [TNC], World Wide Fund for Nature [WWF], Conservation International [CI]). Some regional NGOs (e.g. Caribbean Natural Resources Institute [CANARI]) will be in a similar position. Many government authorities and smaller NGOs or CBOs may not have thought strategically about resource mobilization, but they can. For example, the Grenada Fisheries Division has partnered with NGOs such as SusGren Inc, Agency for Rural Transformation and the Grenada Fund for Conservation to mobilize resources that were difficult for a government unit to access and utilize for coastal and marine activities. The University of the West Indies (UWI), University of Guyana, University of Belize, St George's University and others all engage in outreach and partnerships with a variety of agencies. Several have taken place in fisheries and aquaculture. Private sector partnerships are also on the increase. In general, partnerships are mutually beneficial, not only financially, but for capacity development and leveraging additional resources.

All the above-mentioned agencies and categories of organization are relevant to resource mobilization for this programme proposal. The CCCCC database, if updated, could be consulted to determine where funds and technical assistance are flowing and with what criteria and conditions. We have previously noted several sources of funding and programmes already in place that can be tapped into for fisheries and aquaculture under the right circumstances. Apart from the initiatives of the four partner agencies (FAO, CRFM, CCCCC and CDEMA), among many, these others include:

- Canada Caribbean Disaster Risk Management Fund;
- Caribbean Challenge championed by TNC;
- Japan International Cooperation Agency (JICA) Master Plan for Sustainable Use of Fisheries Resources for Coastal Community Development in the Caribbean;
- Pilot Program for Climate Resilience of the Strategic Climate Fund;
- USAID's Climate and Development Strategy;

As noted under limitations above, criteria and conditions change rapidly and often unpredictably in the donor world. Such changes are often beyond the influence of

[1] Venture for Fund Raising. 2009. *Resource mobilization: a practical guide for research and community-based organizations*. Second edition. Manila.

potential beneficiaries and are not related to the merits of the assistance sought. Relationships are critical in resource mobilization.

Chapter 3 of the IP considers financing and should be consulted for specifics related to the private sector, national governments, regional organizations and international financing institutions. It says that currently more than 20 global climate change funds exist. The situation is similar for DRM. If the CRFM is to take the lead in championing the fisheries and aquaculture aspects of the modified IP, and the proposals to be outlined shortly, then relationships with FAO, CCCCC and CDEMA are critical. The CCCCC is especially adept at obtaining and passing on funds for implementing its programmes of work. Implementing agencies will need to pay special attention to fund flexibility.

For effective resource mobilization, an alliance or consortium comprising the four major agencies may be necessary. The CRFM (presumed lead agency) is already set up to deal with Member State engagement at all stages of the policy and planning cycles. The Caribbean Fisheries Forum can accommodate all the agencies and NGO partners at the technical level, while the Ministerial Council provides a conduit to the entire policy level apparatus of CARICOM. New alliances will also be needed at the national level between the several governmental agencies, NGOs, civil society groups and private sector firms. Fisheries advisory committees, where they exist, could be involved.

It is highly recommended that, in keeping with the concepts that underpin this initiative and the proposals below, adaptive management be a cornerstone of the approach to design and execution. In country consultations, the participants noted that inflexible donor conditions, budgets and schedules were serious constraints, particularly at the community level where adjustments constantly had to be made in order to ensure the best outputs and to achieve expected outcomes.

Resource mobilization must therefore include partnerships for participatory monitoring and evaluation, action learning groups, learning networks and the like in order to institutionalize adaptation. In some cases, there will be a need for pre-investment in developing the capacities of community partners, especially to undertake the roles required of them in adaptive management. The proposals below, selected mainly from the measures at the end of the assessment study, anticipate this design. The majority of the measures are not included in the proposals. During the country consultations, it was often stressed that there were existing resources potentially available to undertake much more work than at present, but the inadequacies of institutional arrangements were a constraint. Therefore, most of the proposals focus first on this aspect rather than technical fixes to the issues in climate and disasters.

4. PROPOSALS

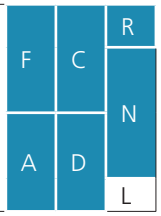
Each of the proposals follows a similar pattern. The working title and scope matrix form the heading. Below is a brief explanation of the rationale. More information on context and the gap being filled is in the assessment study. Next is the logframe, followed by explanatory concept notes where necessary. Some proposals are more complete than others. All proposals require further negotiated development.

Although there is considerable overlap, the proposals are presented in the order of primarily regional followed by national and local. Each higher level is expected to link to those below, so regional proposals will have national components and so on. The reverse is true to a lesser extent. Local proposals may aggregate through a learning network to provide national lessons or capacity, or be replicated at the regional level, but such scaling up is not warranted in every case.

4.1 REGIONAL

The following are proposals for the regional level, meaning that although many aspects may be implemented nationally or even locally there is a need for strong regional leadership in order to coordinate and make best use of economies of scale, scaling up and replication. Although the CRFM, through its Secretariat, may be the most obvious lead agency, this arrangement is not necessary. The CRFM was originally conceptualized as a network in which various countries or agencies would take the lead on initiatives where they had comparative advantage such as interest, experience or capacity.

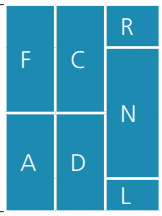
4.1.1 Develop a protocol that specifically addresses integrating CCA and DRM into the CCCFP and national fisheries and aquaculture plans



Although the Regional Framework and IP led by the CCCCC and the Enhanced CDM Framework led by the CDEMA are key policy documents, there is also a need for the CRFM to have stronger policy than exists at present in the CCCFP. Therefore, as provided for, it is proposed that a brief protocol be developed to mainstream CCA and DRM in national fisheries and aquaculture planning and management. This would reflect political and technical will and become an asset for mobilizing resources, particularly at the regional or subregional levels that some donors prefer for economies of scale and reduced risk.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Long-term political will enhances the resilience of fisheries, aquaculture	- Fisheries, aquaculture plans increase adaptive capacity and reduce vulnerability to disasters	- CCCCC, CDEMA, CRFM, etc. report on adaptation and disasters	Prepared plans are actively utilized in a full policy cycle
Outcome CARICOM/CRFM key enabling policy for institutionalizing CCA and DRM into fisheries and aquaculture	- six countries formulate fisheries management plans (FMPs) and aquaculture plans with CCA and DRM integrated within 12 months of protocol	- CRFM web pages on country profiles - CDEMA website	Countries follow through with plan preparation
Outputs Protocol to the CCCFP on CCA, DRM, FMPs	- Protocol completed within six months of CCCFP entry into force	- CRFM website	Countries agree to cooperate
Activities - Approval by CRFM Ministerial Council - Review and approval by CRFM Forum - Consultancy to prepare draft protocol - Disseminate IP with strategic action plan - Communication to inform about proposal	**Resource mobilization** - This may be done without external resources and the output achieved in 6 months with US$20 000 - Simple communication products (e.g. flyer and slides) to be used by fisheries authorities and fisherfolk organizations (US$15 000). Newspaper articles and in-kind costs are not included. - Consultancy (one person × US$500/day × 10 days) - Meetings for review and approval are covered by CRFM regular budget CARICOM heads of government approve the CCCFP		Learning from the CCCFP protracted process prompts more efficient and effective approach
Inputs - Funding for activities estimated US$20 000 - Consultant expertise - Modified CCCCC IP - Approved CCCFP			

4.1.2 Disseminate CDEMA CCA2DRR tools (e.g. G tool) and supporting material to stakeholders, select preferred tools and create learning networks to develop active communities of practice within CRFM



During the country consultations, it was clear that the several tools available for CCA2DRR and the integration into fisheries and aquaculture were little known by many or shared by the few who were familiar with them. The CDEMA tools are examples. This lack of knowledge mobilization is a serious hindrance to achieving several other desirable impacts. More than just a selection of tools, there needs to be an active community of users communicating with one another and interested parties in order to create a critical mass of capacity that is learning and adaptive.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Tools and techniques enhance the resilience of fisheries, aquaculture	- Increased adaptive capacity and reduced vulnerability to disasters attributable to fisheries, aquaculture CCA2DRR tools and techniques	- CCCCC, CDEMA, CRFM, etc. report on adaptation and disasters	Tools, techniques selected and used prove to be useful in practice over the (adaptive) long term
Outcome Suite of CCA2DRR tools actively used in all aspects and levels of fisheries, aquaculture	- Countries, communities and private sector use CCA2DRR tools widely in fisheries, aquaculture in six countries	- CRFM web pages with plans prepared using the tools	Countries follow through with active use of the suite
Outputs - Network community of practice using tools - Suite of preferred CCA2DRR tools	- CCA2DRR tools ready for use within six months - CCA2DRR tools on CRFM, Caribbean Network of Fisherfolk Organisations (CNFO) websites - Virtual community exists for CCA2DRR in fisheries, aquaculture	- CRFM mailing list statistics show activity - CRFM website and communication products - CNFO website and communication products	Agreement is possible on a suite of tools rather than independent efforts
Activities - Consolidation of users into a community of practice for CCA2DRR - Creation of a learning network to test the tools and share learning - Selection of preferred tools after review - Link benchmarking B-tool with the G-tool - Communication to inform stakeholders on CCA2DRR tools, with emphasis on reaching the most vulnerable	**Resource mobilization** - This may be done with modest external resources and outputs achieved in 12 months with US$150 000 - Maximum use can be made of information and communications technology and networks of country leaders to be cost-effective regionally and create a virtual community with minor travel costs - CDEMA and other CCA2DRR products are easily available electronically. Minor printing US$5 000 - Communication can utilize existing platforms but some information technology support and web services may be required in some places. US$10 000 - Testing of the tools will be done in collaboration with the several ongoing CCA and DRM projects as part of normal implementation, so funds required mainly for standardized participatory monitoring and evaluation reporting, learning and building the community of practice. US$15 000 - Some tools may require small purpose-designed test cases achievable through small grants to NGOs and CBOs. US$70 000 - Integrate B-tool with G-tool and refine through testing. US$50 000		Improvement in communication between CRFM countries and the stakeholders within them is possible
Inputs - Funding for activities estimated US$100 000 - Expertise of leading CCA2DRR thinkers in the Caribbean, globally - Communications network functional - CDEMA and other CCA2DRR products for evaluation, testing	Countries in CRFM are genuinely interested in mainstreaming CCA2DRR		

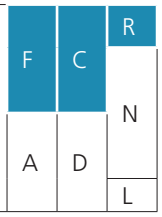
4.1.3 Increase the content related to climate and disasters in fisheries and aquaculture related university courses and research

F C R N A D L

Limited human capital and capacity is a constraint in most small island developing States (SIDS). The CRFM has agreements such as memoranda of understanding with tertiary educational institutions, among which the UWI is the largest in the region. The CRFM and UWI are working on a research agenda to assist the latter in meeting the demands of the CARICOM region. Increasing the content related to climate and disasters in fisheries and aquaculture courses and research (natural science, social science and interdisciplinary) will assist in capacity development. It is an investment in the future as well as the present.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Enhanced resilience of fisheries, aquaculture and related systems owing to tertiary education	- Graduates contribute to increased regional adaptive capacity and reduced vulnerability	- Ad hoc UWI reports on accomplishments of graduates in the region	Course content is adaptable to the market demands
Outcome Integrated suite of UWI and other university courses and research is demand-driven to meet needs in CCA/DRM	- Application and matriculation for courses remains high beyond two years	- UWI and other tertiary calendars of courses - UWI theses library	Lag time between design and delivery is short enough to still satisfy the market
Outputs - Modified degree and non-degree courses - Functioning research agenda setting process	- Courses established and research approved by the 2014 Caribbean Fisheries Forum - Training modules developed, established and on curriculum of at least one regional university by 2015	- UWI course prospectus and enrolment annual statistics digest - Reports of the Forum	Faculty can be allocated to offer the courses on campuses and open university
Activities - Scholarships for initial support of students who test these new products - Creation of short and online and non-degree courses or segments - Global search for similar work elsewhere - Determine interest and potential for involving other universities (e.g. in Belize, Guyana, Suriname) - Curriculum review and reform at multiple levels across all science - Forums to better link demand to educational supply for CCA/DRM	**Resource mobilization** - This may be done with regional resources and the outputs achieved in 18 months with US$200 000 - Course, research and curriculum market analysis and development by survey and promotion and outreach to new funding partners. US$50 000 - Curriculum consultancy (50 person-days × US$500/day). Total US$25 000 - Online and other meetings for course, research development and review. US$25 000 - Scholarships for initial students. US$100 000 The proposal fits as well with the UWI strategic plan as it first appears and is given priority		Scan and market analysis provide evidence upon which to proceed
Inputs - Funding for activities estimated US$200 000 - Allocation of UWI staff to the proposal - Curriculum consultant - New partnerships with donor agencies to build, fund courses, research			

4.1.4 Determine data sharing required between fisheries stock assessment and climate models; and initiate data exchanges



Data and research to assess the impacts of climate variability and change on fisheries and fish stocks have been suggested by authors within and outside the Caribbean[2]. Although it is unlikely to be cost-effective or useful to try to use or develop fine scale models, it will be useful to have improved broad understanding of how climate and

[2] E.g. Mahon, R. 2002. Adaptation of Fisheries and Fishing Communities to the Impacts of Climate Change in the CARICOM Region: Issues paper. Prepared for the CARICOM Fisheries Unit, Belize City, Belize; Singh-Renton, S. 2002. The impact of global environmental change on fisheries in the Caribbean – outlining research needs. Submission to Regional GECAFS Preparative Working Group Meeting, 19-20 September 2002, CARDI, UWI, St. Augustine; Bell J. D., J. E. Johnson, and A. J. Hobday. 2011. Vulnerability of tropical pacific fisheries and aquaculture to climate change. Secretariat of the Pacific Community, Noumea, New Caledonia.

fisheries are linked, and how and why these links change. Direct and indirect pathways, and fish versus fisheries, need to be differentiated. For example, reduced catch can result in higher ex-vessel market prices that benefit the harvest sector but threaten food security. A closer connection by way of communication between downscaled climate modelling and fisheries modelling is advocated in order to potentially improve the quality of information available for decision-making.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Enhance resilience of fisheries systems with ecosystem modelling	- Climate linked models build adaptive capacity	- CRFM and Western Central Atlantic Fishery Commission (WECAFC) reports on resilience	Improved linkages achieved between advice and policy
Outcome Climate-linked models of fisheries ecosystems improve regional decision-making	- Advice provided at the CRFM Forum and other bodies such as WECAFC is based on these models	- CRFM and WECAFC reports on policy advice	Countries follow through with using the models and sharing data
Outputs Climate-linked models of fisheries ecosystems	- At least six fisheries managers are trained in using outputs from climate-linked fisheries integrated models	- CRFM annual scientific meeting and species working group reports - (Revised) FMPs	Technical issues can be overcome
Activities - Advice offered by CRFM and WECAFC - Develop appropriate climate and ecosystem-based fisheries models - Consultancy to build linked data system - Determine overlap in data needs and uses of climate and fisheries predictive models	**Resource mobilization** - This may be done with external resources and the output achieved in 12 months with US$100 000 - Consultancy (100 person-days × US$500/day). US$50 000 - Data acquisition, communication, pilot assessments. US$50 000 - Meetings for review, approval and advice are covered by CRFM regular budget Experts agree that such modelling is cost-effective		Technical issues can be overcome
Inputs - Funding for activities estimated US$100 000 - Consultant expertise - Fisheries and climate modelling expertise			

4.1.5 Develop post-harvest processing and marketing capacity to use underutilized, unfamiliar, altered season or more abundant species

F C R N A D L

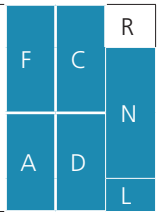
Climate change and increasing variability is expected to result in shifts in species distribution, life cycles and migration. Species not previously of commercial interest may become potential targets. It may be easier for the harvest sector to adapt to these changes than for the processing establishments, fish vendors and consumers to do so. Attention must be paid to making these components of the seafood value chain adaptive as well. Some of the adaptation may be accomplished through Technical Cooperation between Developing Countries (TCDC).

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Food security enhanced through post-harvest sector adaptation	New local seafood items are in good supply with sufficient demand	Annual economic statistics on seafood	Initiative is sustained long enough to be institutionalized
Outcome Post-harvest enterprises acquire new adaptive capacity through TCDC	New techniques are in use in at least 4 countries within 12 months	Reports of the fisheries and marketing authority	Post-harvest sector is receptive to the new techniques and marketing
Outputs - Marketing strategies for new seafood items - Processing techniques adaptive to variability	- Marketing strategies for at least three seafood items ready for industry - Processing techniques adopted by post-harvest in at least 4 countries within 9 months	Reports of the fisheries and marketing authority	Seafood trade does not undermine this activity
Activities - Develop appropriate processing techniques including for quality assurance monitoring - Develop marketing strategies for products - TCDC arrangements for mobilizing expertise - Determination of the priority processing adaptation needed - Assessment of likely changes in landings	**Resource mobilization** - This may be done with international resources and the outputs achieved in 24 months with US$300 000 - Develop appropriate processing techniques and develop marketing strategies. US$100 000 - Product development and marketing consultancy to visit about five countries with range of species landed (100 person-days × US$200/day). Total US$20 000 - Harvest and market analysis and new product development with marketing trials. US$50 000 - Purchase of raw material, processing trials and development of Hazard Analysis and Critical Control Points (HACCP) systems. US$130 000		Suitable post harvest consultant available via TCDC
Inputs - Funding for activities estimated US$300 000 - Post-harvest consultant - Information on fish harvest and markets	Changes in landings are not totally unpredictable		

4.2 NATIONAL

The following are proposed primarily for the national level, bearing in mind that there should be vertical and horizontal links to the regional and local levels, plus participation from countries.

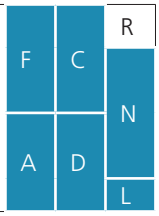
4.2.1 Mainstream CCA and DRM into national ecosystem-based, livelihood-centred management plans for fisheries, aquaculture



Government and non-government fisheries stakeholders in the four country consultations were very insistent that climate and disaster plans driven into the sectors would be unsuccessful. They said that national plans for fisheries and aquaculture needed to be ecosystem-based and comprehensive with livelihoods (sustainable and alternative) as their focus. Such strong sentiments were in stark contrast to the abundant evidence that efforts by the CARICOM Fisheries Resource Assessment and Management Program (CFRAMP) and then the CRFM to institutionalize fisheries management planning (including aquaculture in some cases) have been unsuccessful in the past two decades. The renewed interest in this, combined with the resources available to address climate change and disasters compared with fisheries and aquaculture, may provide new incentives and vigour. Success in this area is key to the attainment of other goals. This proposal concerns mainly Strategy 1 in the IP.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Livelihoods and well-being improve and are sustained due in part to proper ecosystem approach to fisheries/aquaculture (EAF/A) planning	- Fisheries, aquaculture EAF management plans improve livelihoods	- Poverty and livelihood assessments, census data	Prepared/approved plans are actively utilized in a full policy cycle to address core areas
Outcome CRFM institutionalizes CCA and DRM into fisheries, aquaculture management planning	- At least two rounds of the full policy cycle are completed based on the agreed duration (e.g. three years)	- Reports of the CRFM Fisheries Forum and Ministerial Council	Countries follow through with plans
Outputs Fisheries, aquaculture management plans are based on ecosystem and livelihood approaches	- Countries formulate FMPs and aquaculture plans with CCA and DRM integrated within 12 months of start	- CRFM website country profiles	Stakeholders accept ecosystem-based management (EBM), livelihoods as the core of plans
Activities - Review, approval by multiple stakeholders and key policy-makers - Consultancies to help revise/ prepare draft F&AMPs - Communication to inform about proposal	**Resource mobilization** - This may be done with minimal external resources except funding (US$1 275 000) and outputs achieved in 18 months - There is sufficient expertise in the CARICOM region for this not to require external assistance, unless primarily to reduce the delivery period - Allocate on average about US$75 000 for each of 17 CRFM countries (amount will vary with size) - Full use can be made of existing knowledge from various sources with no new primary data collection necessary. Most funds to consult and communicate - FAO regional technical cooperation programme is the most likely source		National and local institutional arrangements are adequate for plans
Inputs - Funding for activities estimate: US$1 275 000 - Consultant expertise - FMP success stories - National experts, data	CARICOM heads of government approve the CCCFP and its CCA/DRM protocol (proposed)		

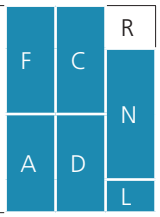
4.2.2 Undertake gender analyses in fisheries and aquaculture to demonstrate usefulness in policy, planning, management



As noted in the assessment (Volume 1), gender requires more attention in projects and regular programming. Clear evidence exists of gender differences connected to climate and disasters. To ignore gender is to compromise interventions. Participants in the country consultations called for community-level gender analyses to guide their work. Several approaches are possible. The one proposed is participatory action research, making use of students and civil society organizations.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Improved well-being and social relations as a result of attention to gender	- Sensitivity to gender issues increases beyond the project period	- Directed community-level research projects	Gender remains on the front burner
Outcome Gender-sensitive policy and practices are mainstreamed	- Both men and women are involved in activities on an equitable basis	- Reports of agencies and NGOs working in the community	Communities carry through with plans that incorporate gender
Outputs Community profiles and guidelines for work that are gender sensitive	- Groups communicate regularly on matters pertaining to gender	- Reports of agencies and NGOs working in the community	Gender analyses are accepted as useful
Activities - Gender analysis used to inform interventions - Attention to youth, the elderly, disadvantaged - Community and national fisheries and aquaculture plans made (more) gender aware - Training in gender analysis for planning	**Resource mobilization** - This may be done with funding of on average US$10 000 per community per year over a period of two years and using about 10 communities to pilot, so total cost is US$200 000 - There is sufficient expertise in the CARICOM region for this not to require external assistance - Several NGOs and the UWI campuses may wish to participate, including providing in-kind support National fisheries and aquaculture plans are available		Community is willing to take gender as a serious matter in planning
Inputs - Funding for activities around US$10 000 per community over two years - Consultant expertise - National FMPs, plans			

4.2.3 Intensify boat registration and licensing, vessel monitoring, safety at sea training and such preparatory measures



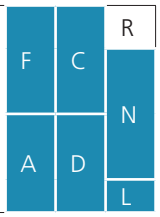
Fisheries authorities and disaster agencies have noted that damage assessment and recovery efforts are hampered by inadequate pre-disaster data on the people and property in small-scale fisheries areas and communities. Seeking information post-disaster is fraught with problems. More importantly, preventive measures are needed to reduce vulnerability, particularly to rough-sea events. Vessel monitoring systems (VMSs) and other means of monitoring, control and surveillance, coupled with vessel registration and licensing systems, should be normal components of fisheries management. In many countries, there is sufficient in-house capacity to make a difference, but resources cannot normally be dedicated to prioritize these matters. Depending upon administrative arrangements, number of interested countries and their capacity, this proposal may be further disaggregated into several separate proposals and phased to suit the situation.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Lives saved; action is more effective and efficient after disasters	- Loss of life reduced by relative percentage to be determined by country	- Fisheries authority and disaster management agency records	New skills and systems are put to the test before they fall into disuse
Outcome Improved database aids capacity for safety of fishers and their vessels	- Fisher organizations are better able to ensure the safety of their members - Data are good and used	- Reports of authorities and fisher organizations	Persons trained use new knowledge in disaster situations
Outputs Improved database, new or improved vessel monitoring system, well-trained fishers	- Fisheries databases near 100% of actual people and property - 50% of fishers trained - VMS fully functional	- Reports of authorities and fisher organizations	Authorities have adequate computer systems in place
Activities - Fisheries registration drive to obtain livelihood data for quick retrieval - Evaluate registration systems in current use (e.g. for companies, vessels and fisherfolk) - Safety at sea training - Small vessel VMS test or system upgrade	**Resource mobilization** - This may be done with funding of on average US$150 000 per country per year each for 10 pilot countries, so total cost is US$1 500 000 - Cost per country will vary considerably with the size of industry and the distribution of fishing locations - External expertise may be required for the VMS - Lessons may be drawn from Grenada's experience		Fishers forego days at sea to be trained
Inputs - Funding for activities around US$150 000 per country for one year each - Expertise of trained fishers as self-help trial - Small vessel VMS - Fisheries officers and fisher organizations			- Trained fishers are available to assist - Small vessel VMS is affordable and practically feasible

4.3 LOCAL

The following are proposed primarily for the local level, bearing in mind that there should be vertical and horizontal links to the regional and national levels and between the participating sites within and across boundaries. Given the low capacities often observed at the local level, ideally most of these proposals will have close oversight from agencies with capacity and shared interests.

4.3.1 Strengthen CCA and DRM linkages especially at local level in order to encourage synergistic interventions, messages



A clear message from the country consultations was that more needed to be done at the local level to integrate and harmonize the various CCA and DRM initiatives with one another and with fisheries and aquaculture activity. This proposal seeks a bottom-up approach to this by strengthening community-level institutions for self-organization, in keeping with CAS and resilience thinking. This will only be successful if there is an enabling policy environment that encourages this.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Livelihoods and well- being improve and are sustained due in part to integrated interventions	- Metrics for quality of life and social capital	- Directed community- level research projects	Fisheries or aquaculture remain aspects of local socio-economy
Outcome Communities integrate CCA and DRM into fisheries, aquaculture	- Improved coping and adaptation strategies	- Reports of authorities after hazard impacts	Communities follow through with plans
Outputs Community groups set up to coordinate inputs based on their priorities within national systems	- Groups communicating regularly and planning strategically with little outside assistance, in partnership with local disaster committees - At least 10% of fishers using insurance to help reduce disaster risks	- Reports of community and national agencies - Reports of insurance companies and fisher organizations	Stakeholders accept responsibilities and long-term outlook
Activities - Community group mobilization around learning by doing and mentoring/coaching - Leadership, insurance and pension, training - Vulnerability capacity assessment training - Gender analysis to inform interventions - Community fisheries and aquaculture plans integrating CCA, DRM and EAF	**Resource mobilization** - This may be done with funding of on average US$30 000 per community per year over a period of 5 years and using about 10 communities to pilot, so total cost is US$1 500 000 - There is sufficient expertise in the CARICOM region for this not to require external assistance - Lessons may be drawn from projects in the region National fisheries and aquaculture plans are available		Community conflict is sufficiently low to make progress
Inputs - Funding for activities around US$150 000 per community over five years - Consultant expertise - National FMPs, plans			

4.3.2 Document the coping strategies that are or have been used for climate variability and disasters to inform interventions

F C R N A D L

The literature on climate and disasters warns that people, including the poor, who have dealt with hazards (sometimes repeatedly) develop coping strategies. These strategies may or may not be compatible with longer-term adaptation and management. To be unaware of such strategies while planning or making community interventions adds to the uncertainty of outcomes and risk of failure. In particular, there is a high risk of interventions causing the erosion of social institutions and their capital.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Livelihoods sustained or improved by better informed interventions	- Metrics for quality of life and social capital	- Directed community- level research projects	Events occur that make use of the new knowledge
Outcome Intervention plans are enhanced by knowledge of coping strategies	- Improved interventions that take coping into account	- Project and programme reports	Communities use the information in plans
Outputs Accessible information on coping strategies used by fisheries and fish farming communities	- Better known coping and adaptation strategies	- Reports of community and national agencies	Research results are communicated in a suitable manner
Activities - Guidelines for taking coping into account - Use CDEMA toolkit, Organization of Eastern Caribbean States (OECS) toolkit, hazard mitigation policy, etc. - Use of several forms of multimedia - Social science studies on coping strategies to inform interventions - Dissemination of information by change agents in communities	**Resource mobilization** - This may be done with funding of on average US$20 000 per community, per year using about 10 communities to pilot, so total cost is US$200 000 - There is sufficient expertise in the CARICOM region for this not to require external assistance Availability of social science researchers		Coping strategies can be determined
Inputs - Funding for activities about US$20 000 per community per year - Researcher expertise			

4.3.3 Develop and implement education/awareness specifically for fisherfolk and fish farmers on climate and disasters

F C R
A D N

It was noted in the assessment that insufficient information on CCA and DRM was reaching people involved in fisheries and aquaculture. It is not that information does not exist, but the messages, pathways and products need to be more strategic. Interventions such as mainstreaming and disaster management and fisheries management planning will fail unless there are informed stakeholders able to participate meaningfully. Gaps in communication can be addressed along with various learning-by-doing projects in order to give information more currency and value.

Results chain hierarchy	Performance indicators	Means of verification	External risks & assumptions
Impact Livelihoods and well-being improved through better communication	- Metrics for quality of life and social capital	- Knowledge, Attitude and Practice (KAP) time series of surveys at index sites	Other factors do not simultaneously erode social capital
Outcome Closer-knit community networks add to social capital in livelihoods	- Improved adaptation strategies through better communication	- Reports of community and national agencies	Communities effectively use communication
Outputs Community groups set up to communicate and are also better informed	- Groups communicating regularly and sharing information strategically	- Reports of community and national agencies	Communication strategy can be integrated with learning by doing
Activities - Community groups targeted communication in local language - Establish partnerships with national, regional entities to help sustain - Train to communicate - Involve governmental and NGO information units at all stages - Production of material for communications - Communication capacity assessment of agencies and locations - Integrated CCA/DRM communication strategy for target communities	**Resource mobilization** - This may be done with funding of on average US$20 000 per community per year using about 10 communities to pilot, so total cost is US$200 000 - There is sufficient expertise in the CARICOM region for this not to require external assistance National fisheries and aquaculture plans are available		Community conflict is sufficiently low to make progress
Inputs - Funding for activities about US$20 000 per community per year - Consultant expertise - CCA/DRM resource materials and guideline for communication - National FMPs, plans			

4.4 SUMMARY

The programme proposal is summarized below, noting that activities may be substantially modified and that few require sequential implementation. There may be cost savings if some are implemented simultaneously. The entire period for implementation is not specified because it is unclear when the programme would start. For synchronization with the IP, extension beyond 2021 is not expected.

Proposal working title	Estimated cost (US$)	Estimated duration
REGIONAL		
Develop a protocol that specifically addresses integrating CCA and DRM into the CCCFP and national fisheries and aquaculture	20 000	6 months
Disseminate CDEMA CCA2DRR tools (e.g. G tool) and supporting material to stakeholders, select preferred tools and create learning networks to develop active communities of practice within CRFM	100 000	12 months
Increase the content related to climate and disasters in fisheries- and aquaculture-related university courses and research	200 000	18 months
Determine data sharing required between fisheries stock assessment and climate models; and initiate data exchanges	100 000	12 months
Develop post-harvest processing and marketing capacity to use underutilized, unfamiliar, altered season or more abundant species	300 000	24 months
NATIONAL		
Mainstream CCA and DRM into national ecosystem-based, livelihood-centred management plans for fisheries, aquaculture	1 275 000	18 months
Undertake gender analyses in fisheries and aquaculture to demonstrate usefulness in policy, planning, management	200 000	24 months
Intensify boat registration and licensing, vessel monitoring, safety at sea training and such preparatory measures	1 500 000	12 months
LOCAL		
Strengthen CCA and DRM linkages especially at local level in order to encourage synergistic interventions, messages	1 500 000	60 months
Document what coping strategies are or have been used for climate variability and disasters to inform interventions	200 000	12 months
Develop and implement education/awareness specifically for fisherfolk and fish farmers on climate and disasters	200 000	12 months
TOTALS (roughly sum funds and time; activities may not be sequential)	**5 595 000**	**5 years**

The summary estimate of almost US$6 million to finance the programme proposal over about five years is very approximate. (See the sections on limitations and the detailed proposals for considerations that apply.) In many cases, it is stated that there is capacity in the region to undertake the activities. While this is so, often that capacity is oversubscribed and may not be available. In such cases, external assistance, most likely at a higher cost, will be required. Funding agencies may impose other criteria and conditions including the use of external consultants.

The Programme proposal is part of an initiative of the Caribbean Regional Fisheries Mechanism (CRFM) and the Food and Agriculture Organization of the United Nations (FAO) on climate change adaptation and disaster risk management in fisheries and aquaculture in the CARICOM and wider Caribbean region. The Programme proposal was discussed at the regional workshop on the formulation of a strategy, action plan and programme proposal on disaster risk management and climate change adaptation in fisheries and aquaculture in the CARICOM and Wider Caribbean Region, which was held in Kingston, Jamaica, from 10 to 12 December 2012. The report of the regional workshop is included in the Fisheries and Aquaculture Proceedings N. 35. The Programme proposal supports the implementation of the Strategy and action plan which were discussed during the same workshop. Proposals are set out in the format of the logical framework used by many technical and funding agencies within and beyond the CARICOM region.

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