



United Nations Environment Programme

Terminal Evaluation of UNEP-GEF Project
“Reducing Pesticide Runoff to the Caribbean Sea”

Hugo Navajas

Evaluation Office

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CONTENTS

Abbreviations

Project Identification Table	6
Executive Summary	7
1. Evaluation Background	10
A. Context	
B. Description of the Project	
C. Evaluation objectives, scope and methodology	
2. Attainment of Project Objectives and Planned Results	12
A. Achievement of Outputs and Activities	13
Component 1: Project Coordination	
Component 2: Demonstration Projects	
Component 3: Institutionalizing Improved Pesticide Management and Strengthening Capacity for Reducing Pesticide Runoff	
A.1 Relevance	23
Sub-regional Environmental Relevance	
Sub-regional Policy Relevance	
Relevance to UNEP and GEF Strategy and Programme	
A.2 Effectiveness	25
A.3 Efficiency	26
A.4 Review of Outcomes to Impacts (Theory of Change)	27
A.5 Ratings of Project Performance	32
B. Sustainability and Catalytic Role	35
B.1 Socio-political Sustainability	35
B.2 Financial Resources	36
B.3 Institutional Framework	37
B.4 Environmental Sustainability	38
B.5 Catalytic Role and Replication	38
C. Processes Affecting the Attainment of Project Results	39
C.1 Preparation and Readiness	39
C.2 Implementation Approach and Adaptive Management	41
C.3 Stakeholder Awareness and Public Participation	41
C.4 Country Ownership and Driven-ness	42
C.5 Financial Planning and Management	43
C.6 Monitoring and Evaluation	45
C.7 UNEP Supervision and Backstopping	46
D. Complementarity with UNEP, UNDP and UNIDO Programmes and Strategies	47

3.	CONCLUSIONS AND RECOMMENDATIONS	47
3.A	General Conclusions	47
3.B	Lessons Learned	50
3.C	Recommendations	53

FIGURES

1.	Effects of GAPs on Pesticide Applications for Selected Crops	16
2.	Theory of Change: Graphic Representation	30
3.	Impact Pathways linking Outputs, Outcomes and Intermediate States	31
4.	Project Performance Ratings	32

ANNEXES

1.	Terms of Reference for the Evaluation
2.	The Evaluation Framework
3.	Evaluation Programme
4.	Bibliography
5.	Project costs and co-financing tables
6.	Review of Project Design
7.	Technical Working Paper
8.	Brief CV of Evaluation Consultant
9.	Example of GAP Impacts in Urabá, Colombia: Before and After
10.	List of Project Publications
11.	List of pesticides analyzed through the Coastal Monitoring Programme
12.	Lessons Learned by Project Participants

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Hugo Navajas

ABBREVIATIONS

ANDI	National Business Association of Colombia
ANIFODA	Nicaraguan Association of Formulators and Distributors of Agrochemicals
AMEP	Assessment and Management of Environmental Pollution
AUGURA	Colombian Banana Growers Association
BICU	Bluefields Indian and Caribbean University (Bluefields)
BICU-CIUM	Bluefields Indian and Caribbean University, Moravo
CATHALAC	Inter-University Center (Puerto Cabeza)
	Water Center of the Humid Tropics in Latin America and the Caribbean
CDC	Cucra Development Corporation S.A.
CeNAT	National Center for High Technology
CEP	Caribbean Environment Programme
CICA	Environmental Pollution Research Center, UCR
CIRA	Center for Investigation on Aquatic Resources, UNAN
CIMAR	Limnology and Sea Sciences Research Center, UCR
CORBANA	National Banana Corporation
CORPOICA	Colombian Corporation of Agricultural Research
CORPOURABA	Regional Autonomous Corporation of Urabá
CSLME	Caribbean Sea Large Marine Ecosystem
GAP	Good Agricultural Practices
GEF	Global Environment Facility
GLOBALGAP	Global Partnership for Good Agricultural Practice
ICA	Colombian Institute of Agriculture
IDEAM	Colombian Institute of Hydrology, Meteorology and Environmental Studies
INVEMAR	Marine and Coastal Research Institute of Colombia,
IMIS	UN Integrated Management Information System
IPM	Integrated Pest Management
LARP	Laboratory for the Analysis of Pesticide Residues, UNC
MADR	Ministry of Agriculture and Rural Development (Colombia)
MAG	Ministry of Agriculture and Livestock
MAGFOR	Ministry of Agriculture and Forestry
MARENA	Ministry of Environment and Natural Resources
MAVDT	Ministry of Environment and Sustainable Development (Colombia)
MINAET	Ministry of Environment, Energy and Telecommunications (Costa Rica)
MCB	Mesoamerican Caribbean Basin
NAP	National Advisory Panel
NC	National Coordinator
NCC	National Coordinating Committee
NCU	National Coordination Unit
NGO	Non-governmental organizations
PDF	Project Development Facility (GEF)
PROAGROIN	Agro-Industrial Development Foundation – Costa Rica
PSC	Project Steering Committee
RAAN	North Atlantic Autonomous Region
RAAS	South Atlantic Autonomous Region
RC	Project Regional Coordinator
RCU	Project Regional Coordinating Unit
REDCAM	Network for Monitoring the Marine Waters of Colombia

REPCar	GEF Project Reducing Pesticide Runoff to the Caribbean Sea
SAC	Colombian Agricultural Society
UCR	University of Costa Rica
UJTL	University of Bogota “Jorge Tadeo Lozano”
UNAN	National Autonomous University of Nicaragua
UNC	National University of Colombia (Bogota)
UNEP	United Nations Environment Programme
UNEP-CAR/RCU	Regional Coordinating Unit of the Cartagena Convention and the Caribbean Environment Programme
UNEP-DGEF	Division of Global Environment Facility Coordination
UNON	United Nations Organization Nairobi

PROJECT IDENTIFICATION TABLE

Figure 1

Project Summary

GEF project ID:	1248	IMIS number:	GFL/QGL-2328-2760-4880
Focal Area(s):	International Waters	GEF OP #:	
GEF Strategic Priority/Objective:	To catalyze transboundary action addressing water concerns. As well relevant to GEF-4 POPs Focal Area SO (Reduce and eliminate production, use and release of POPs) and Programmes GEF IV Strategic Objective 1 for International Waters Focal Area is applicable: To foster international, multi-state cooperation on priority water concerns.	GEF approval date:	May 2002
Approval date:	October 2005	First Disbursement:	
Actual start date:	October 2006	Planned duration:	47 months
Intended completion date:	November 2009	Actual or Expected completion date:	December 2011
Project Type:	Full Sized Project	GEF Allocation:	US\$ 4.295 million
PDF GEF cost:		PDF co-financing:	
Expected MSP/FSP Co-financing:		Total Cost:	15.4 million
Mid-term review/eval. (planned date):	July 2009	Terminal Evaluation (actual date):	October 2012
Mid-term review/eval. (actual date):	October 2009	No. of revisions:	4
Date of last Steering Committee meeting:	December 2009	Date of last Revision*:	14/04/2011
Disbursement as of 30 June 2011:		Actual expenditures reported as of 30 June 2011:	Pending as accounts from IMIS are overestimating the execution of 2011 with approx. US\$80,000
Total co-financing realized as of 30 June 2011:	USD 11.105 million	Actual expenditures entered in IMIS as of 30 June 2011:	US\$ 4,260.395.60
Leveraged financing	CropLife LA: USD 100,000 EU: EUR 1,000,000 Switzerland: EUR 150,000		

EXECUTIVE SUMMARY

1. In line with UNEP Evaluation Policy, the terminal evaluation of the Project “Reducing Pesticide Runoff to the Caribbean Sea”- GEF 1248 was undertaken between September and November 2012, practically one year after the end of the project, to assess performance, and determine outcomes and impacts stemming from the project, including their sustainability. The evaluation had two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP, interested governments, the GEF and their partners. The evaluation was guided by a set of key questions, based on the project’s intended outcomes, that are listed both in the report and the annexed Evaluation Terms of Reference.
2. Evaluation findings indicate that GL4880 “Reducing Pesticide Runoff to the Caribbean Sea” has been a successful project that offers an innovative approach to linking environmental conservation with economic incentives that are market-driven, through operational and mutually beneficial partnerships with private sector institutions. The project has played an important role in helping to showcase the work of UNEP in the region and particularly in Central America.
3. The project achieved most of its planned outputs and results in a satisfactory manner, and generated enabling conditions to sustain them. There were measurable reductions in pesticide applications in the three participating countries (Colombia, Costa Rica and Nicaragua), resulting from the adoption of good agricultural practices (GAPs) that were focused on integrated pest management (IPM) methods. Reductions in the use of all pesticides on demonstration sites ranged between 18% and 61% for banana, plantain, pineapple and African Palm; and between 90% and 97% for bean and rice crops according to project reports. While overall levels of pesticides residues found in the marine environment were not high, as indicated in the final Coastal Monitoring Report, some critical cases were highlighted i.e. the presence of selected organophosphates and herbicides. This suggests that further work is still needed.
4. Demonstration activities were linked to GAP and IPM training activities that combined training workshops, visits to demonstration sites and farmer-to-farmer extension. More than 2,000 farmers, technical staff and extension workers received training through the demonstration projects, while an additional 6,000 attended training events that were implemented by national partner institutions. During the evaluation, many respondents highlighted training and demonstration as the most important project contributions. The project contributed to the increased application of GAPs, both in terms of the number of farmers adopting these practices and land area. This has generated tangible economic benefits through international certifications that enhance access to export markets and offer higher prices, as well as cost savings from reduced applications of chemical pesticides.
5. Enabling conditions for basin-scale pesticide monitoring were strengthened through the development of a coastal monitoring programme and Protocol that standardized analytical methods, established a network of monitoring sites across the MCB, and generated baseline data on pesticide residue levels that is methodologically consistent and comparable between countries. The provision of training and equipment has expanded the range of pesticide analysis capabilities among the participating research laboratories, contributing to ISO 17025 certification for pesticide tests covering different matrices.
6. The project had less impact on national policies and legal/regulatory frameworks. Support was provided to the drafting of proposals for national crop certification programmes and streamlined pesticide legislation among other activities. However, these initiatives have

not led to the approval of new policies, laws or the revision of existing frameworks, although opportunities to influence legislation are still available in the three countries. The limited impact achieved in this respect reflected more on project design than performance; the associated outputs, outcomes and indicators were largely outside the project's attribution, timeframe or budget possibilities. None of the countries have ratified the Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol), despite the project's contribution in implementing provisions of the Cartagena Convention and LBS Protocol in particular. However, the project has helped create more awareness of the Land Based Sources of Marine Pollution Protocol (specifically Annex IV on Agrochemical run-off) and the ratification process remains active in the three countries.

7. Although the evaluation noted high levels of overall performance, there is no evidence that the project has made a difference in relation to the general objective of reducing pesticide runoff to the Caribbean Sea. The effects of GAPs applied at demonstration sites could not be correlated to lower pesticide runoff or residual levels, despite significant reductions in the use of chemical pesticides for targeted crops. This was influenced by (i) the limited number, scale and duration of demonstration projects; (ii) the scheduling of monitoring campaigns during early stages of GAP demonstration; (iii) the effects of climatic factors; and (iv) consistently low baseline pesticide levels at demonstration sites that were within international standards and did not differ between conventional methods and GAPs. A measurable impact will require the broader adoption of GAPs and inclusion of more pesticide-intensive crops, periodic monitoring of pesticide levels, and continued support for training and demonstration by national institutions.

8. This project was relevant in both concept and approach by validating practices that reduce the need for pesticide applications, raise productivity, are replicable and in many cases cost-effective. It had a high level of sub-regional policy relevance by supporting the implementation of international environmental agreements. In particular, it promoted provisions of the Cartagena Convention for the Protection & Development of the Marine Environment of the Wider Caribbean Region, and in particular those pertaining to the Protocol to the Convention Concerning Pollution from Land-based Sources and Activities (LBS Protocol). Likewise, the project objective was consistent with UNEP's 2012-2013 Programme of Work and the GEF Strategic Priority Objective for trans-boundary action on international waters concerns.

9. In general, the effectiveness and efficiency of project implementation and management has been highly satisfactory and reflected a commendable performance by the Regional Coordination Unit and national partners. The consistent support provided by UNEP CAR/RCU was another contributing factor. The project was able to overcome challenges that included a 7-year gap between project design and commencement (requiring the re-programming of project activities, substantive changes in demonstration project design, and budget revisions); a slow start-up phase; and asymmetrical implementation processes between countries that were reinforced by different capacity levels. There were administrative delays with the approval of contracts, and some demonstration activities were affected by late contract disbursements. Nevertheless, the monitoring, adaptive management and "quality control" applied by the RCU were drivers of project efficiency and contributed decisively to successful implementation.

10. One year after the project's finalization, evaluation findings suggest that sustainability is highly likely in Colombia and (to a lesser extent) Costa Rica due to the combination of market incentives and institutional capacities; whereas sustainability in Nicaragua's Atlantic Coast is less evident due to the factors of geographic isolation, lower institutional presence and a more difficult operating environment. In several cases GAPs and training activities are continuing and/or being expanded by national partner institutions with their own resources. The relatively high sustainability levels observed during the evaluation is

good news, given the uncertain approval status of the proposed US\$ 17 million follow-up project “Improved Management of Agrochemical Life Cycles in the Caribbean and Central American Region” that was submitted to GEF for review.

11. The project’s implementation approach and institutional arrangements were key contributing factors to project performance. The implementation strategy was well conceived and enhanced project performance and impact by articulating an integrated, multi-tiered approach to pesticide management. Environment and economics were intrinsically connected and generated synergies that were reflected in the results achieved. The project’s efforts to promote integrated pest management and lower pesticide use were reinforced by international market requirements and associated economic benefits. There were high levels of preparedness: Institutional arrangements were built around existing networks and collaborative processes, facilitating the project’s insertion at the country level and ensuring coherence with ongoing initiatives and institutional priorities. These factors raised the level of national ownership and encouraged institutional commitments as reflected in the level of co-financing contributions from national partner institutions and their effective performance in most cases.

I. EVALUATION BACKGROUND

A. Context

12. “Reducing Pesticide Runoff to the Caribbean Sea” or RepCar as it was known, was designed to reduce the pesticide runoff to the Caribbean Sea in the Mesoamerican Caribbean Basin (MCB) countries of Colombia, Costa Rica and Nicaragua.

13. The project had global relevance by implementing provisions of the Cartagena Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region, and especially the Protocol Concerning Pollution from Land-based Sources and Activities (LBS Protocol) that requires Parties to adopt national policies for rational pesticide management. It addressed perceived environmental threats from chemical-based pest management that was being applied to meet rising demand for export crops. Agriculture was and remains critical to the economies of MCB countries. Despite the importance of tourism, the export of agricultural produce remains the principal source of foreign exchange earnings for these countries – providing 32% of Nicaragua’s gross national product (GNP) in Nicaragua, 19% of Colombia’s and 18% for Costa Rica.

14. The project justification was based on reportedly high levels of pesticide runoff and residual levels in the MCB that carried environmental and health risks. Much of this was based on the prevailing situation and data of the 1999-2000 PDF phase: As stated in the project document, in 1999 the MCB countries imported more than 14,600 metric tons (active ingredients) of pesticides, and produced an additional 13,300 metric tons that were applied to 21 crops on about 3 million hectares. They included insecticides that were restricted or banned in developed countries.¹ The use of pesticides was actively supported by government policies through subsidies and tax incentives that encouraged farmers to increasingly rely on chemical pest management methods.

B. Description of the Project

15. The project was designed with the objective of reducing pesticide runoff to the Caribbean Sea, through the implementation of good agricultural practices (GAP) with emphasis on Integrated Pest Management (IPM); periodic monitoring of pesticide levels; and measures to improve pesticide management and the legal/regulatory frameworks in Colombia, Costa Rica and Nicaragua. The project consisted of four main areas of activity (grouped into three components) that are summarized below:

- *Demonstration sites:* Each country promotes Good Agricultural Practices (GAPs) for specific crops that contribute pesticide runoff into the Caribbean Sea, by implementing demonstration projects (demonstration sites) on farmer parcels. The environmental, social and economic impacts of different practices are analyzed and practices validated. The best practices are adopted by an increasing number of farmers as the result of the demonstration sites and training.
- *Coastal monitoring and evaluation:* A regional coastal monitoring programme is established to monitor pesticide runoff into the coastal environment, through pesticide residue analysis of selected matrices. The capacities of the national research laboratories are strengthened, providing the basis for long-term monitoring and ISO accreditation. Equipment and training are provided to improve data analysis and interpretation. The monitoring findings inform decision-makers.

¹ Such as methamidophos, phosphamidon, methyl parathion and monocrotophos - covered by the Prior Informed Consent Procedure - carbofuran and malathion.

- *Institutionalization of improved pesticide management:* Activities are undertaken to institutionalize improved pesticide management and strengthen the capacity for reducing pesticide runoff. National policy frameworks and regulatory systems for the use and control of pesticides are reviewed and crop certification programmes supported. Information on project activities and results are disseminated by various means.
- *Project Coordination:* UNEP-CAR/RCU is responsible for project execution, and a Regional Coordination Unit (RCU) is created with responsibility for overall management and implementation. National Coordination Units (NCUs) are likewise established within the environmental ministries. The project coordination arrangements link the Regional (RCU) and NCUs to the regional Project Steering Committee (PSC) and National Coordination Committees (NCCs).

16. The implementation strategy articulated the regional, national and sub-national levels where most activities took place. National institutions were contracted to implement demonstration projects, pesticide monitoring and capacity building activities. Stakeholder participation was built into the institutional framework through National Coordination Committees and a regional Project Steering Committee that combined advisory and decision-making functions.

17. The full project cycle was divided between a preparatory PDF phase (1999-2000), which was followed by the approval of the Full-Sized Project in 2005 that commenced implementation in 2007. The approved project budget totalled US\$ 9.92 million including a US\$ 4.295 million GEF grant and US\$ 2.2 from governments; by the end of the project the total budget stood at US\$ 15.4 million due to substantial increases in co-funding from national partners. The extended gap between design and implementation weakened the project's start-up phase and required early revisions to the budget and work plans, as well as two project extensions until December 2011.

C. Evaluation objectives, scope and methodology

18. In line with UNEP Evaluation Policy, UNEP's Evaluation Manual and the Guidelines for GEF Agencies in Conducting Terminal Evaluations, the Terminal Evaluation of the project "Reducing Pesticide Runoff to the Caribbean Sea" was programmed at the end of the project to assess project performance (in terms of relevance, effectiveness and efficiency) and to determine outcomes and impacts stemming from the project, including their sustainability. As stated in the ToRs, the evaluation has the primary purposes of: (i) Providing evidence of results to meet accountability requirements, and (ii) promoting learning, feedback, and knowledge sharing through results and lessons learned among UNEP, interested governments, the GEF and their partners.

19. The evaluation was focused on a set of guiding questions, based on the project's intended outcomes, which were expanded upon during project interviews:

- How successful was the project in establishing effective regional cooperation and consolidated regional/national networks among project countries for the assessment and management of environmental pollution?
- To what extent did the project validate good agricultural practices (GAP) and in particular, Integrated Pest Management (IPM) for some of the major crops of the MCB?
- Has the project made progress towards streamlining laws and regulations for pesticide management?
- How successful was the project in increasing knowledge of the compatibility between agriculture and environment, and improving public awareness on the importance of agricultural sources of marine pollution?

20. To look into these questions, the evaluator triangulated findings from:

- The review of project documentation and publications (listed under Annex 5);
- Interviews with the (ex) regional project coordinator, national coordinators and (by telephone) UNEP CAR/RCU representatives;
- Meetings with national implementing and target institutions (producer associations and cooperatives, research institutes, other ministries, universities and NGOs); and
- Field visits to demonstration sites to view results on the ground and interview a sample of growers.

21. The year that had lapsed since the project's end provided the evaluator with an *ex-post* perspective that was useful for evaluating the sustainability of project results beyond the implementation term, and the evolution of the proposed follow-up project that plans to extend project activities to 8 countries in the wider Caribbean basin.

2. ATTAINMENT OF OBJECTIVES AND PLANNED RESULTS

Summary of Findings

22. The project was successful – and very effective – in achieving most of the planned outputs and results. There were measurable reductions in pesticide applications in the three countries that resulted from the adoption of GAPs. In several cases this process has continued beyond the project. Reductions in the use of all pesticides varied from crop to crop and were in the range of 7.6% to 53.3%.² Herbicides were eliminated completely on several demonstration sites in the three countries.

23. Inter-institutional collaboration and public-private partnerships that were supported by the project continue to function in Colombia and Costa Rica, extending training activities and GAPs beyond the project term. The adopted monitoring protocol stands to facilitate regional cooperation and the availability of a geo-referenced database. The capacities of INVEMAR, CICA and CIRA to analyze levels of pesticide residues were permanently strengthened by the provision of equipment and training, leading to their ISO17025 accreditation. The good use of project information at the national level has been a priority. However, the difficulty of coming to an agreement on the sharing of monitoring information between some countries (due to territorial disputes) has restricted the circulation of detailed national findings.³

24. The project has had less influence on national policies and legal/regulatory frameworks than was originally planned. The ratification of the LBS protocol of the Cartagena Convention remains pending for the three countries, although the process remains open. The project encouraged national certification proposals in Costa Rica and Colombia, and could provide inputs for regulating recently approved legislation for pesticide and water resource management in Colombia.

² Source: 2011 Project Implementation Report (PIR)

³ GL 4880 Final Report (2011), pg. 11.

A. Achievement of Outputs and Activities⁴

Component 1: Project Coordination

26. This component was designed with the outputs of (i) an established project coordination unit, (ii) continuation and expansion of institutional frameworks for improved pesticide management, and (iii) guidelines for demonstration projects.

15. All outputs and activities under this component were fully realized. A Regional Coordination Unit (RCU) was established and led by a Regional Project Manager with close links to UNEP's Caribbean Environment Programme (CEP) and Regional Caribbean Coordinating Unit (UNEP-CAR/RCU), which serve as Secretariat to the Cartagena Convention. National Coordination Units with appointed Project Managers were created within the implementing ministries – the Ministry of Environment in Colombia, Ministry of Environment, Energy and Telecommunications in Costa Rica, and Ministry of Environment and Natural Resources in Costa Rica). National Coordination Committees were established that have facilitated collaboration between ministries and public-private partnerships with producer associations and research institutes. A regional Project Steering Committee (PSC) composed by the main actors (including UNEP) provided general oversight, met annually and has contributed to important project decisions. A coastal monitoring protocol that is applicable beyond the project term was approved. Project implementation mechanisms and guidelines for demonstration sites were also agreed on. Initial attention was given to updating project work plans and budgets in response to the seven-year delay between the PDF and the project's commencement. The PSC, NCUs and NCCs were active during the project's first year and provided input to budget revisions, re-programming of activities and decisions on project extensions.

27. The hiring of project assistants for the Regional and National Coordination Units during the second year sharply improved country coordination and responsiveness, while strengthening national ownership. National project assistants assumed a large share of the project's operational and administrative responsibilities. Their work has been essential in moving the implementation process forward and enabled national project coordinators to focus on substantive issues. The project assistants were frequently mentioned as important contributors to project effectiveness and efficiency.

28. Views regarding the effectiveness of project management and coordination were consistently positive in the three countries. The general appreciation reflects a commendable performance by the RCU and most of the implementing national partners. The project institutional framework built on existing relations and created opportunities for operational collaboration. It also built on prior cooperation between national research centers that was supported by IAEA. Implementation and management arrangements in general have worked very well and have value as a model for future projects.

Component 2: Demonstration Projects

29. The second component combined capacity building with the implementation of demonstration projects to test and validate Good Agricultural Practices (GAP). The outputs were:

- Training in pesticide management and monitoring;

⁴ This analysis is based on the outputs listed in the project document's logical framework matrix (and not planned project results) as required in the evaluation Terms of Reference.

- Design, implementation and documentation of demonstration projects for selected crops in each country;
- Study tours for demonstration project coordinators; and
- Monitoring protocols for demonstration projects.

Percentage of Targeted Farmer Populations applying Good Agricultural Practices - 2010

Colombia - banana: 95%
 Colombia - plantain: 67%
 Costa Rica - banana: 98%
 Costa Rica - pineapple1: 74%
 Costa Rica - pineapple2: pineapple: 29%
 Nicaragua - beans: 95%
 Nicaragua - oil palm: 23%

(Source: 2011 Project Implementation Review/PIR)

30. The outputs associated with this component were fully achieved. The quality of the demonstration projects was generally very high in design, implementation and the documentation of results. The activation of demonstration projects was slower than planned, and several coped with shortened implementation timelines. In some cases the combined delays, time constraints and funding limitations affected the validation and sustainability of project results (e.g. Nicaragua's RAAS).

Training in pesticide management and monitoring

31. Many respondents highlighted training or capacity building as the most important project contribution. Training was based on GAPs and Integrated Pest Management (IPM) and combining training workshops with visits to demonstration sites. According to project reports more than 2,000 farmers, technicians and workers received GAP training through the demonstration projects. An additional 6,048 farmers and technical staff attended GAP training programmes implemented by national partner institutions.⁵

32. UNEP CAR/RCU's association with CropLife Latin America was replicated in Colombia and Costa Rica, where private sector funding was obtained for GAP training. The practices were based to an extent on those promoted by CropLife and participating institutional partners. Diversity was recognized. Crops were selected by each country which, combined with the different farming systems, environmental conditions and socio-economic aspects, led to different training approaches in form and content. The training given to large banana enterprises in Costa Rica differed from that to small bean farmers in Nicaragua's RAAN.

In Colombia, GAP training indirectly contributed to increases in the number of banana and plantain receiving Global Gap certification (467 in 2007 to 548 in 2010).

33. The Farmers Association of Colombia (SAC) designed and co-implemented the training programme for **Colombia** in association with AUGURA and ANDI (the national chamber of agricultural producers). According to country reports, 5,017 persons from all Colombia received GAP training that included field visits. Over 80% of the farmers that participated applied some of the practices in response to the increased rains that arrived with the *Niña* current.⁶

34. The training modules given by SAC in Urabá, Colombia¹ are representative of the content used for banana growers:

- Safe use of pesticides
- Integrated pest management

⁵ 2011 Project Implementation Review (PIR)

⁶ *Experiencias en BPA y Protección del Medio Ambiente-GEF REP/Car (2011)*

- Design and application of GAPs
- Calibrating spraying equipment
- Basic agricultural concepts
- Occupational health and its relation to agrochemical handling
- Field visit to demonstration sites

35. In **Costa Rica**, GAP and IPM training were contracted to leading enterprises in the cultivation and marketing of banana and pineapple that apply good practices and provide training for associated growers. This offered a cost-effective means for reaching a wider audience. CORBANA trained 346 associated producers and technical staff; PROAGROIN did the same with 828 small/medium-scale pineapple growers, and gave technical assistance to almost 200 producers. BANACOL held training events that were attended by 323 persons between staff members and independent growers. According to PROAGROIN, the scale of associated pineapple growers that managed plant wastes and applied IPM doubled as a result of project training. Several GAPs were incorporated into the core training activities of large enterprises (CORBANA and PROAGROIN in Costa Rica; SAC and AUGURA in Colombia). There were more informal examples of capacity building. These included farmer-to-farmer extension in Colombia's Magdalena region, often driven by the requirements of Global Gap or RainForest Alliance certification. CORBANA estimates a 20-30% increase in GAP adoption among its associated producers since 2010.

36. Training in **Nicaragua** was designed and implemented by the Institute for Training and Research on Integrated Rural Development (ICIDRI) of the National Polytechnic University. Training workshops were also given by the *Campo Limpio* Corporation that is associated to CropLife Latin America and promotes on-farm cleanliness and safe practices. GAP training in Nicaragua was directed at large-scale African Palm cultivation and smallholder bean and rice farming. Workshops held in the North and South Autonomous Atlantic regions (RAAN and RAAS) were attended by technical personnel, extension workers from the Ministry of Agriculture, Livestock and Forestry (MAGFOR), representatives of farmer organizations and growers.

37. GAP training in RAAS was attended by 389 growers from 64 farms devoted to African Palm and bean cultivation, and 29 owners of pesticide distribution businesses (for training on safe pesticide management). In the RAAN, 216 farmers attended the workshops for bean and rice growers, as well as 34 owners of pesticide distribution businesses and 53 producers from other parts of Nicaragua. According to reports 95% of trained bean and rice farmers and 23% of African palm growers had adopted GAPs. This seemed to decline – at least in Kukra Hill - after the project's termination, perhaps because of lack of follow-up and the difficulties of obtaining the recommended cover crop seeds of kudzu grass and *frijol abono* bean. ICIDRI uses the training materials for other extension activities in rural Nicaragua. It is likely that farmers and extension workers are still applying some GAPs in RAAN although this was not confirmed.

38. The strengthening of national research laboratories in pesticide detection and the use of new equipment enabled INVEMAR, CICA, LARP and CIRA to detect a wider range of molecules. LARP is now able to analyze 71 composites of pesticide residues. The training and equipment triggered important capacity benefits leading to ISO17025 certification for pesticide tests in several matrices. The training process was built around institutional twinning and previous cooperation supported by the IAEA, and helped close capacity gaps between national research laboratories. There were transfers of knowledge between partner institutions: CORBANA and other producer associations were trained by CICA on how to collect samples for pesticide analysis by CICA; as were BICU and AUGURA in Nicaragua and Colombia (by CIRA and INVEMAR).

Development, implementation and documentation of demonstration projects

39. A key project component was the validation of GAPs and IPM on demonstration sites to encourage broader adoption. Demonstration projects were the means for linking various project elements – training, demonstration, monitoring - and were intended to lead to wider interventions in the MCB and wider Caribbean. The selection of different crops, ecological zones, communities and farming systems encouraged diversity and strengthened the project's relevance to different sub-national contexts.

40. Sites were located on parcels that ranged considerably in size and baseline practices. This allowed the project to reach larger numbers of banana and plantain growers through demonstration projects and training. CORBANA has 155 associated banana growers while PROAGROIN works with 135 pineapple growers. In Costa Rica, the extensive estates owned by BANACOL and CORBANA gave the opportunity to influence an important segment of the area devoted to banana cultivation. A similar case occurred with the banana cooperatives in Colombia.

41. Demonstration project results were generally positive and often very much so. Pesticide use was reduced in the range of 20-90% on demonstration sites and herbicides were eliminated entirely in several cases. Protocols were validated for the implementation of demonstration projects for 6 combinations of crops/regions. A number of good practices were applied, documented and can be replicated. In several cases they are being continued by national institutions that were partners to the project.

Figure 2

Effects of GAPs on Pesticide Applications for Selected Crops

<p>Colombia Banana: between 4.9 and 6.3 kg a.i./ha/year - between 11 and 18% reduction. Plantain: between 5.0 and 6.2 kg a.i./ha/year - between 35 and 43% reduction.</p> <p>Costa Rica Banana: 5.0 kg a.i./ha/year - 8 % reduction. Small pineapple farmer: 23 kg a.i./ha/year - 61 % reduction. Large pineapple farmer: 27.5 kg a.i./ha/year - 35 % reduction.</p> <p>Nicaragua Rice and bean: 1.5 (bean) y 2.1 (rice) kg a.i./ha/year - 97 % (bean) and 91 % (rice) reduction. African Palm: 2.4 kg a.i./ha/year - 23 % reduction.</p>
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Source: *GL 4880 Final Report, Annex 1*

42. Demonstration projects in **Colombia** were implemented by AUGURA on banana sites located in the Magdalena and Urabá regions. Practices were drawn from different sources including AUGURA, CropLife Latin America, Colombia's Agriculture and Livestock Institute (ICA) and ANDI. Training and technical assistance were provided to a large number of cooperative banana and plantain growers, and demonstration activities monitored during four production cycles. Demonstration sites were selected with growers that already applied good practices and those that didn't. This broadened relevance to different levels of farmer awareness, enhancing GAP demonstration under different conditions. Demonstration sites were equipped with hygienic facilities and improved physical infrastructure to segregate pesticide handling from post-harvest processing and other activities. Calendarized activity schedules were mounted to help producers monitor the application of GAPs. Demonstration

farmers interviewed by the evaluator were eloquent and continued to apply these practices one year after the project's completion. As an example, a "before and after" summary of demonstration results that were documented in Urabá is presented in Annex 1.

43. According to AUGURA, the demonstration projects reduced the cost of pesticides from US\$ 16.70 to US\$13.00 per hec./year. The combination of cover crops and mechanical control lowered herbicide applications of paraquat and glyphosate by 22% and 32%, while eliminating the use of diquat. There are social effects as well. In Urabá, the project has helped to strengthen ties in communities of migrants and displaced persons. School children have become familiar with GAPs by reading them to illiterate parents and helping to monitor activities. The recycling of plastic banana bags in Urabá has reportedly increased to over 42 43ns/year (baseline figures were not available to measure the level of increase).

44. A key motivator for the adoption of GAPs among banana (and pineapple) growers was the requirement of good practice and low pesticide for Global Gap certification, which improved access to EU markets at prices 20% higher. Part of the added income is retained by t44 cooperative for a Social Fund (*Prima Social*) that funds community infrastructure, crop insurance, education and other social services. The project GAPs enabled small-scale growers to qualify for additional certification by RainForest Alliance for access to the international Fair Trade markets. The project has indirectly contributed to the increase of certified banana growers since 2009.

45. Demonstration projects in **Costa Rica** were implemented on two banana plantations owned by the National Banana Corporation (CORBANA), BANACOL's extensive pineapple plantation and on two smaller sites linked to the PROAGROIN Foundation. Baseline water and sediment samples had revealed low baseline pesticide levels; the demonstration projects further lowered the application of nematicide pesticides by 33% and herbicides entirely (from 8 applications/year) through cover crops and biological control. Ground covers of *allocacia* were extended along drainage canals to absorb pesticide residues and contain runoff to water bodies. There were improvements in soil and banana root quality through the substitution of synthetic fertilizers with beneficial microorganisms and non-acidifying sources of nitrogen.⁷ An important benefit was reduced soil erosion – a recurrent problem during the rainy season – with the application of ground cover vegetation.

46. One year after the project's termination, CORBANA had extended ground cover vegetation to 178 hec. and planned to extend this (and *allocacia* to drainage canals) to the entire 1,200 hec. by 2013. Cost savings on fungicides average 25%, although the labor needs of mechanical control methods raised overall production costs, at least in the short term. More extended monitoring is needed to assess their economic viability. The demonstration projects were visited by many of CORBANA's 155 growers as part of the project training. This has influenced the consistency of GAP applications among growers, which improved by 20-30% during the last two years according to staff. CORBANA has incorporated several GAPs to its technical manuals. Demonstration activities encouraged bio fermentation to accelerate the decomposition of organic waste to replace chemical fertilizers; there are now 17 bio fermentation facilities operating on farms (before the project there were none).

47. On the pineapple demonstration sites, IPM led to significant reductions in the use of agrochemicals: Nematicides were reduced by 70%, herbicides by 100% (35% for the full plant cycle), fungicides by 70% and insecticides by 55%.⁸ The total decrease in pesticides

⁷ REPCar en Costa Rica - Experiencias exitosas para reducir el impacto de la agricultura sobre los ecosistemas costeros: Resumen de resultados y logros (2011)

⁸ REPCar en Costa Rica - Experiencias exitosas para reducir el impacto de la agricultura sobre los ecosistemas costeros: Resumen de resultados y logros, pg. 20 (2011)

was equivalent to 40% of the full agrochemical package that is normally applied to pineapple. PROAGROIN staff estimate that pest control costs were lowered by 66% for inputs and by 45% for services. The recycling of plant wastes as ground cover raised the levels of soil nutrients while eliminating the need for removal; although there were costs associated with the production of microorganisms. The mechanical control methods used were 15% lower than those of herbicides.

48. BANACOL's placed a polyethylene ground cover on two sites within a 2,300 hec. pineapple plantation helped to stabilize sandy soils during the rainy season; and prevent invasive weeds, nematodes and other pests. However there were high costs for the polyethylene material - US\$2,500 per hectare – that were partially compensated by savings in herbicide and pesticides. BANACOL also processed plant waste into organic fertilizer for reintroduction to the soil. GAPs applied the first pineapple production cycle lowered the use of nematicides by 30% and eliminated herbicides; this was equivalent to 35% of the full agrochemical application. The combined practices accelerated growth and raised productivity to an additional 1,300 boxes/hec. on demonstration sites. BANACOL has expanded the use of plastic ground cover and other practices with internal resources from an initial area of 5 hec. to 900 hec.⁹ Plastic ground covers have proven feasible for large-scale enterprises such as BANACOL that have economies of scale but do not appear viable for smaller producers due to high costs.

49. The Ministry of Environment and Natural Resources (MARENA) and Bluefields Indian & Caribbean University (BICU) implemented demonstration activities in Nicaragua's Atlantic autonomous regions (RAAS and RAAN). Demonstration sites were devoted to large-scale African Palm cultivation owned by the Cukra Development Corporation (CDC) and small farmer parcels that also produced beans and rice. The approach applied in Nicaragua was more socially oriented; the focus for beans and rice was on sustainable food production for family consumption. This reflected a very different context from that of Colombia or Costa Rica, as well as a more difficult operating environment. There were logistical difficulties, extreme weather conditions (inundations from Hurricane Ida), resource limitations and, after start-up delays, little time – the demonstration projects covered only one growth cycle. Yet the activities supported in Nicaragua added diversity and learning value to the project.

50. The project established demonstration sites on 210 smallholder rice and bean parcels. GAPs lowered the quantity of pesticide used from 2.25 kg./ha. to 0.20 kg./hec. Herbicide applications were reduced by 1.62 kg./ha. Natural insecticides based on garlic, capsicum and soap lowered the need for chemical pesticides by 96% and herbicides by 90%. The application of plant waste as ground cover and mechanical weed control with a hoe were found most effective in reducing herbicide applications. The combination of these practices also contributed to increased rice yields according to country reports. However, costs associated to various practices were equivalent or higher to those of conventional methods given higher labor requirements. IPM demonstrations on bean parcels reduced insecticide applications from 0.45 kg. to 0.02 kg./ha. and herbicides from 0.45 kg. to 0.02 kg. per hectare during the growth cycle. The use of color traps and a capsicum/soap insecticide were proven more cost-effective than conventional methods, reducing costs per hectare by over 50%.¹⁰

⁹ Based on evaluation interviews and the information documented in *REPCar en Costa Rica - Experiencias exitosas para reducir el impacto de la agricultura sobre los ecosistemas costeros: Resumen de resultados y logros*, pg. 22 (2011)

¹⁰ Demonstration figures drawn from *Proyecto Reduciendo el Esguerrimiento de Plaguicidas al Mar Caribe: Informe Final Nicaragua* (MARENA, 2012) and *Sistematización de*

51. Demonstration projects were also implemented on African Palm plantations and bean crops in Kukra Hill municipality (RAAS) by BICU in collaboration with the Cukra Development Corporation (CDC). Activities included the planting of kudzu grass and a bean variety (INTA red bean-SM 18 or *frijol abono*) as cover crops and nitrogen sources. The evaluations indicated that the cover crops were suitable during the initial stage of the palm growth cycle but declined due to insufficient sunlight as the palm crowns developed. Beyond this stage, the mechanical control methods applied by CDC (using rollers or *rolas*); were considered more effective. The use of polyethylene ground covers had a longer effect in controlling weeds and was more cost-effective. The use of leguminous ground covers was associated to improved harvests and also demonstrated a positive benefit-cost ratio.¹¹ However, the difficulties and cost of obtaining kudzu grass and *frijol abono* seed at the demonstration sites lowered the feasibility of long-term adoption (there was no evidence of their use during the brief evaluation visit to Kukra Hill).¹² CDC provides pesticides to growers on credit, but was not stocking these seeds nor had it adopted the practice. IPM methods were also tested, with insect traps of fermented sugar cane juice, banana, and pineapple-molasses combinations evaluated as being most effective.

Study tours of demonstration project coordinators

52. The output was achieved. Study tours, exchanges and field visits were built into the project training and capacity building approach. Two regional meetings were organized for the exchange of experiences between demonstration projects. These meetings included field visits, discussion sessions, and an advisory panel of external experts. Farmers managing demonstration sites were also invited to the project's final regional meeting held at Cartagena, Colombia in which country experiences, results and lessons were exchanged.

Monitoring protocols for demonstration projects

53. The output was achieved. Monitoring protocols were developed for demonstration projects by participating national research institutes – INVEMAR and LARP in Colombia, CICA in Costa Rica and CIRA in Nicaragua. The monitoring programme formulated a comprehensive manual in Spanish and English that includes sampling, analytical and quality control procedures for fresh and marine water and sediment.

Component 3: Institutionalizing Improved Pesticide Management and Strengthening Capacity for Reducing Pesticide Runoff

54. The third component was essential to consolidate project results and sustain GAP dissemination, capacity building and pesticide monitoring. The following outputs were foreseen under this component:

- Development and dissemination of project outreach and awareness materials as well as specific materials on GAPs and IPM.
- Legislative and policy reform initiatives.
- Establishment of a crop certification programme.

Capacitaciones, Validaciones, Divulgación de Buenas Prácticas Agrícolas y Monitoreo del Ecurrimiento de Plaguicidas al Mar Caribe Nicaraguense (MARENA 2012)

¹¹ *Proyecto Reduciendo el Ecurrimiento de Plaguicidas al Mar Caribe: Informe Final Nicaragua (MARENA, 2012)*

¹² Updated information is lacking because has not been monitoring of GAP utilization or adoption since the project's termination.

- Establishment of a coastal pesticide monitoring programme including the certification of three laboratories-one in each of the participating countries
- Training materials and a train-the-trainers workshop
- A regional workshop for information exchange on demonstration project results

55. Most outputs were fully achieved, although the coastal monitoring has not been “established” and there have not been monitoring campaigns since the project ended (with the notable exception of INVEMAR in Colombia). Nor have the reform initiatives led to new or revised policies and legislation, although opportunities remain for this to happen.

Development and dissemination of project outreach and awareness materials as well as specific materials on GAPs and IPM

56. The project produced an extensive list of technical publications and outreach materials on GAPs, IPM and demonstration sites that have utility beyond the project (Annex 3). Training materials were developed for each of the six crops and placed on the project website that is presently managed by UNEP CAR/RCU. They were designed with input from national institutions that implemented demonstration activities, and convey the results of GAPs and IPM methods in accessible terms. An indicator of their value is that several institutions (CORBANA, SAC, AUGURA and ICIDRI) use these materials as inputs for their own training activities. Some publications were translated into English to encourage their use in Anglo-phone Caribbean countries. Posters, flyers, videos and promotional materials were also disseminated for awareness raising and to promote the project.

57. A geo-referenced coastal monitoring database was developed and is managed by UNEP-CAR/RCU by mandate. There are advantages to this arrangement. Some countries had objected to the publication of monitoring data for politically sensitive areas, yet all data can be accessed online.

Legislative and policy reform initiatives

58. A major project outcome was eliminating conditions that encouraged the indiscriminate use of pesticides. The project would help to streamline national laws and regulations, ensuring better enforcement capacities. Project results would be documented to inform policymakers and influence the policy, legal and regulatory frameworks for pesticide management and related environmental issues.

59. The project assisted the design of proposals for national certification programmes and other initiatives, but this has not led to new or revised national laws or policies thus far. This reflected more on design and country variables than project performance. National conditions had changed substantially during the time passed between project design and implementation. The outcome indicator - “recommendations implemented by national governments” – was largely outside the project’s control or capacity to influence. In some cases, time limitations and budget cuts lowered the amount of attention given to dissemination and policy advocacy during the project’s final stages. The logical framework matrix noted that getting governments to revise and improve their legal framework was a “critical assumption” that required legislative or executive action.¹³

60. The project did address policy issues in the three countries by supporting the design of the following:

¹³ Logical Framework Matrix, project document, pg. 27

- A draft Decree offering tax benefits for investments that generate environmental benefits (Colombia)
- Inputs to the Colombian Agrarian Institute (ICA) to regrant legal resolution 4174 on ICA good practices.
- A national certification programme for GAPs that was endorsed by several ministries (Costa Rica)
- A pre-feasibility study for a national GAP Certification programme in Nicaragua.
- Legal norms for the transport, storage, handling and disposal of pesticides, which will be presented to the National Commission on Norms for evaluation as a prerequisite for their approval (Nicaragua).
- Project activities in Nicaragua's RAAN enabled the identification of unauthorized pesticides that enter illegally across the border with Honduras. The National Commission on Pesticides and the Ministry of Agriculture, Livestock and Forest Resources (MAGFOR) was informed of this and a response is expected.

Establishment of a crop certification programme

61. The conditions on which this output was based had changed considerably by the time the project started in 2007. International good practice certifications by Global Gap and RainForest Alliance had been established in Colombia and Costa Rica for banana and pineapple growers that improved access to export markets with higher prices. Due to the new situation, the project shifted attention to existing certification schemes and lowered the budget for this output. As mentioned earlier, proposals for voluntary national certification programmes were developed in Nicaragua and Costa Rica. However, bringing the proposals to fruition involved a longer-term commitment that was outside the project's time and funding possibilities. There are pending issues of institutional mandates; budget needs and funding sources; crops to be covered; economic incentives and consumer education; and reaching dispersed small-scale producers that supply the domestic market. In *Colombia*, the *Exito* supermarket chain – one of the country's largest - plans to introduce GAP incentives for growers that supply fruit and vegetables

Establishment of a coastal pesticide monitoring programme including the certification of three laboratories

62. This coastal monitoring programme was created and campaigns were implemented, generating important baseline information that is compatible in analysis methods and comparable between the three countries. Monitoring guidelines were agreed by INVEMAR, CICA, LARP and CIRA in 2007 and a Protocol adopted in 2008 with external guidance from a panel of experts. Five monitoring campaigns were implemented between 2008 and 2010 to test the presence of selected pesticides in fresh water and river and marine sediment during rainy and dry seasons. The project provided Nicaragua with a first opportunity to cover the spectrum of soil, freshwater and saltwater sampling in pesticide monitoring. Training courses were hosted by CICA in Costa Rica, with exchanges and communications between laboratories continuing until 2010.

63. A number of pesticides were pre-selected (see Annex 3) and their presence measured from samples taken at 44 sites that were spread over 29 sampling zones in the three countries. Monitoring samples revealed low levels of pesticide residue that were within permissible levels and did not present an immediate environmental threat. No persistent organic pesticides (PoPs) were used on the selected crops and less than 4% of the samples showed quantifiable levels of pesticides.¹⁴ Monitoring campaigns were implemented by the

¹⁴ The most common pesticides detected in banana and plantain samples from Colombia's Urabá region were propiconazole and chlorpyrifos. A similar case was found with the

research institutions with some changes: The September 2008 campaign (rainy season) was fully implemented in the three countries, but marine monitoring was discontinued by Costa Rica after the first exercise due to the very low levels that were detected. Further monitoring at marine sites is not a priority for Costa Rica and, according to CICA staff, would be more cost-ineffective if contracted to INVEMAR, which has greater capacity and an equipped boat. In Nicaragua, CIRA implemented two campaigns over the three-year period. Biological samples were taken from oysters in Bluefields Bay (Nicaragua); passive samplers that replicate fish membrane were applied for the first time in Nicaragua and Costa Rica.

64. The coastal monitoring programme enabled the three countries to develop baseline data on pesticide samples taken at rivers that drained the demonstration sites, coastal lagoons and marine locations. Monitoring methods were harmonized between the three laboratories through the Monitoring Protocol and training hosted by CICA. This was an important step that improves the comparability and integration of data. A geo-referenced database was designed and is hosted by INVEMAR on behalf of UNEP CAR-RCU. The capacities of INVEMAR, CICA, LARP and CIRA to measure pesticide residue levels were strengthened through training and the purchase of new equipment. They are now able to analyze a wider range of pesticides (including organochlorinate pesticides) at lower levels of concentration. An example of this is CICA, which now has 1,710 pesticide-related tests accredited. The mass spectrograms co-funded with project funds enable the laboratories to detect an additional 50 pesticide molecules that were not accessible previously, in quantities significantly smaller than were possible earlier.

65. These improvements broadened the range and quality of services offered by the laboratories of these institutes, contributing to ISO17025 certification for pesticide tests in several matrices. INVEMAR is in the process of expanding its ISO accreditation to include the analysis of organophosphates pesticides. While capacities have been strengthened, future monitoring campaigns and the programme's continuity will depend on national funding, institutional commitment and - for Costa Rica - revised institutional norms¹⁵ to enable this activity.

Training materials and a train-the-trainers workshop

66. The output was fully achieved. A large set of training materials were developed that include GAP and IPM manuals, technical reports, posters, flyers, videos and promotional materials. Some of the materials were produced by national institutions that implemented the demonstration projects. These documents convey the analysis and validation of GAP results

Magdalena banana samples, where most common were epoxiconazole and chlorpyrifos. In Costa Rica, small amounts of pesticides (Epoxiconazole, Tebuconazole, Chlorpyrifos, Terbufos and Bifentrin) were found in demonstration plots. Endosulfan is still used legally on other crops in Costa Rica and Nicaragua although it was recently added to the Stockholm Convention. The insecticide diazinon (used to control a quarantined pest) and Triadimefon (for preventive treatment of planting materials) were found in very low levels on small pineapple demonstration sites. On large-scale pineapple sites traces of bromacyl, diazinon, diuron and triadimefon were found and significantly reduced at the end of the demonstration project. The herbicide paraquat was detected during the first sampling but not after that. The molecules detected in rice were Methyl Parathion, Dieldrin, Gamma-chlordane, pp-DDT, Heptachlor, Oxamyl and gamma-HCH (Lindane); most of the products found were not related to pesticides currently used but to other highly-persistent products applied in the 1980's to sugar cane plantations that have since been discontinued. Within the consistently low levels, greater concentrations were measured during the rainy season due to higher runoff. All countries took more samples were taken than were required by the programme.

¹⁵ For the National Fito-sanitary Service and Water Directorate.

in accessible terms. Most of the practices were selected in-country by implementing institutions and were suited to the different contexts. Several national institutions (CORBANA, SAC, AUGURA and ICIDRI) presently use these materials as inputs for their own technical assistance and training activities. Training programmes were designed and implemented in each country; the activities included training-of-trainer workshops and visits to demonstration sites.

A regional workshop for information exchange on demonstration project results

67. The regional workshop was held towards the end of the project in Cartagena, Colombia to integrate project findings and exchange experiences. Participants included producers from the demonstration sites, extensionists and technical staff from government institutions, and representatives of producer associations and other organizations linked to the project (including UNEP). The participants that were interviewed gave positive feedback on the workshop's organization and content. The interaction of different stakeholders from the three countries has added depth and a broader perspective to the analysis of project experiences and lessons learned.

A.1 Relevance

68. This project was relevant in both concept and approach by validating practices that reduce the need for pesticide applications, raise productivity, are replicable and in many cases cost-effective. The diversity of the MCB enhanced the project's relevance at the basin scale and led to different implementation approaches (and levels of effectiveness) between sites and countries. Demonstration activities were directed at different crops – banana, plantain, pineapple, African palm, rice and beans – that were chosen by each country and located on sites that varied considerably in size and farming practice. Demonstration sites in Colombia's Magdalena region combined banana plots that applied good practices to some degree (and whose growers were well positioned to influence neighbors) with those that never had. The GAPs promoted by the project were suited to different scales of production. These factors strengthened the project's relevance to different agricultural, socio-economic and cultural contexts.

"Alex [the regional project manager] understood our message and strengthened it."

- Vice Minister of Agriculture, Nicaragua

"The project was very well thought out."

- A senior CICA staffmember

69. Project design recognized the multi-dimensionality of pesticide management by combining support for on-site demonstration activities and training with institutional strengthening, policy advocacy, legal reform and monitoring. This approach has improved the project's relevance to the needs of participating countries that were identified during the PDF phase. The implementation arrangements and strategy are relevant institutionally for UNEP and CropLife Latin America by demonstrating an effective and workable approach for bringing environmental organizations and the private sector closer, and by linking environmental protection and conservation to economic and market incentives. The GAPs promoted by the project were relevant to the needs of producers and has enabled a larger number of banana and pineapple growers to access export markets and take advantage of free trade agreements with the EU and North America. Likewise, the project's flexibility in adjusting its implementation approach in Nicaragua to the needs of small-scale farmers who produce for family consumption (and to the Atlantic Coast's autonomous decision-making framework) was highly appreciated by MARENA and other project partners.

70. To an extent, the project's ability to build on existing processes and play a catalytic role reinforced its relevance and ensured coherence with national and subnational contexts.

Demonstration, training and monitoring activities were consistent with – and often shaped by – the goals and work plans of the national institutions that implemented them. In Nicaragua, the project offered MARENA and ICIDRI the opportunity to extend their work to the Atlantic Coast and build links to regional academic institutions such as BICU.

Sub-regional Environmental Relevance

71. The project was designed with the overall objective of reducing pesticide runoff to the Caribbean Sea. This objective rested on the assumption of high contamination levels of persistent organic pesticides (PoPs) in the Mesoamerican Caribbean Basin (MCB), and was based on reports by WWF, rising quantities of pesticide imports (in 1999, 14,600 metric tons of active ingredients were imported and 13,000 metric tons produced regionally), and growing demand for food crops by international markets. The fundamental assumptions of high runoff and contamination were largely undermined by monitoring findings that revealed low baseline levels of pesticide residues in soil and water samples that did not present an immediate environmental threat. This was very good news that did not strengthen the project's justification. However, nor did it weaken project relevance to the needs of producers or to the perennial search for conservation approaches that are economically viable and compatible with market forces. The project was particularly relevant in helping banana and pineapple growers apply good practices and IPM methods that enable GlobalGap certification. The cost savings that resulted from lower pesticide use were important to counter the rising costs of agricultural inputs in general and cope with fluctuating exchange rates.

72. With the confirmation of low baseline pesticide levels, project's primary relevance shifted from mitigation to prevention. In this respect, the project has encouraged good practices that sustain - and improve on – existing low pesticide levels; and created conditions to sustain basin-scale pesticide monitoring by national research institutes. The relevance of these actions against the risks of indiscriminate pesticide use to human health, surface and ground water, and the overall coastal environment is obvious.

Sub-regional Policy Relevance

73. The project had sub-regional policy relevance by supporting the implementation of international environmental agreements. It applied provisions of the Cartagena Convention for the Protection & Development of the Marine Environment of the Wider Caribbean Region, and in particular those pertaining to the Protocol to the Convention Concerning Pollution from Land-based Sources and Activities (LBS Protocol), which requires that Parties develop national plans to prevent, reduce and control the runoff of pollutants from agricultural lands under Annex IV. Project design influenced the formulation of the 2002-2003 work plan for the Caribbean Environment Programme's AMEC sub-programme, which was adopted at the inter-governmental meetings of the CAP Action Plan and the Cartagena Convention. There were initial expectations that the project would encourage participating countries to ratify the LBS Protocol, which has not occurred to date.

Relevance to UNEP and GEF Strategy and Programme

74. The project objective is consistent with UNEP's 2012-2013 Programme of Work and the GEF Strategic Priority Objective for trans-boundary action on international waters concerns. This is in turn related to the GEF-4 POP Focal Area "Reduce and eliminate production, use and release of PoPs" and in particular to Strategic Programme 1 "Strengthening Capacities for NIP Implementation."

75. There were linkages with on going GEF and UNEP activities. Collaboration was foreseen with GEF projects in the region that involved UNEP. Among these were

“Sustainable Management of the Shared living Marine Resources of the Caribbean Large Marine Ecosystem (CLME) and Adjacent Regions” and “Integrated Coastal Management with Special Emphasis on the Sustainable Management of Mangrove Forests in Honduras, Guatemala and Nicaragua.” The coastal monitoring programme developed with participating national research institutions built on past cooperation initiatives supported by IAEA.

A.2 Effectiveness

76. The project was effective in achieving most of its outputs, but does not appear to have influenced the fundamental objective of reducing pesticide runoff to the Caribbean Sea. Project findings and evaluation interviews acknowledge the difficulty of correlating the changes in pesticide residue levels to the application of GAPs, and more so in marine environments. Hence any likely influence would also be very difficult to prove. At some sites, the analysis of monitoring samples have indicated reductions in pesticides runoff but the correlation with project interventions is not reliable - samples were taken during the initial stages of GAP application and the limited variance with baseline levels is likely to have been influenced by climatic factors.

77. An intervening factor was the overstatement of the problem the project objective intended to address, which was based on the assumption of high pesticide runoff and contamination levels in the Mesoamerican Caribbean Basin. This assumption built on the reports of WWF and other environmental organizations, increased international demand for commercial export crops, and rising pesticide imports. However, baseline pesticide samples that were taken at 42 monitoring sites during the first monitoring campaign revealed consistently low levels of pesticide residue that were within international standards and did not represent an immediate environmental threat. Nor were significant differences found between samples taken from demonstration sites that applied conventional methods and those that applied GAPs. As far as the monitoring results indicate, pesticides were – and are - widely used for the selected crops, yet generally seem to be applied rationally despite critical residues for some organophosphates and herbicides. Traces of PoPs detected on Nicaragua’s Atlantic Coast were attributed to previous sugar cane and cotton projects that have been discontinued since the 1980’s.

78. There were also contributing factors of scale and continuity. The limited number and duration demonstration projects did not allow the project to generate the cumulative effects needed to influence coastal pesticide runoff on a basin scale, even when pesticide applications were reduced considerably at demonstration sites. A measurable impact would have required the broader adoption of GAPs (extended to other crops), periodic monitoring over time, and continued support by national institutions.

79. In strategic terms, project effectiveness was reinforced by the compatibility of environmental goals with market opportunities that offered economic incentives and cost savings to producers. The project was very effective in demonstrating the environmental and economic benefits of GAPs, despite commencement delays and time limitations that affected project implementation in Costa Rica and particularly Nicaragua, where demonstration timelines barely covered one full crop cycle. Effectiveness was nurtured through collaboration with different stakeholders that included ministries, large-scale enterprises, producer associations, cooperatives, universities and subsistence farmers. The capacity differences and implementation asymmetries between countries offered twinning opportunities between research laboratories and other institutions that reinforced the project’s regional dynamic. At the country level, Colombia’s performance stands out for its

effectiveness; the implementation process in that country was considered “exemplary” by the Mid-term Evaluation.¹⁶

80. In terms of implementation strategy and institutional arrangements, the project has demonstrated an effective approach that can be replicated in countries where primary producers are competing to enter international markets. The project carries high institutional value for UNEP and GEF as well, by showing a way of working effectively and in a mutually beneficial manner with private sector enterprises, producer associations and farmer communities.

A.3 Efficiency

81. The project stood out for its efficient management, implementation arrangements and performance. This was reflected in the professionalism and commitment of the RCU and National Coordination Units team, and in the quality of the overall implementation process. The project successfully coped with major commencement delays and asymmetrical implementation processes between countries, through close coordination and adaptive management. All demonstration projects were completed by the end of the project cycle (a final report was pending in Nicaragua), which was extended by an additional year to compensate for initial delays in project commencement.

82. The project had a difficult start that gradually improved. Operationalization was slow and affected by the extended gap between the project’s design during the PDF phase (1999-2000) and its activation in 2007. The slow start-up was aggravated by the need to revise and update budgets and work plans, and initially low levels of country ownership in Costa Rica and Nicaragua. There were delays in confirming country co-financing contributions to the project and in appointing national coordinators. The recruitment of project personnel was in some cases undermined by lengthy administrative procedures; the hiring of the RCU administrative assistant took 15 months. The approval of some contracts was delayed and the final project report noted that “...Administrative procedures in UNEP [are] not always flexible and able to respond quickly to changing demands.”¹⁷ The difficult operating environment and limited project experience of some of implementing entities have had bearing on the timing and effectiveness of activities in Nicaragua’s Atlantic Coast. The regional bureaucracies of the autonomous RAAN and RAAS regions further delayed the commencement of project activities by requiring clearance at four different levels. To a lesser extent there were delays in activating demonstration projects in Costa Rica. Final reports on GAP results were also postponed by delays in completing demonstration activities and case study reports. Likewise, data management errors were detected at the final regional meeting, requiring the revision of extensive data sets that caused “significant delays” in the publication of final results.¹⁸

83. The performance of the regional coordinator and UNEP CAR/RCU were recognized as key determinants of project efficiency by most interviewees. The RCU effectively managed parallel implementation processes in three countries and maintained open channels of communication and coordination with national partners. The regional project coordinator’s responsiveness to country needs and feedback¹⁹ was highly rated by all

¹⁶ “*Reducing Pesticides Runoff to the Caribbean Sea: Mid-Term Project Evaluation*” (LAGA, 2009), pg. 31

¹⁷ GL 4880 Final Report (2011)

¹⁸ Based on interviews and the findings of the GL4880 Final Report.

¹⁹ Including several recommendations made by the Mid-Term Evaluation (as described in Annex 4 of the GL4880 Final Report)

respondents. The hiring of capable project assistants contributed decisively to overall project efficiency. The Executive Director of CropLife-Latin America considered that the project was managed efficiently and without biases, by publishing monitoring findings that confirmed lower-than-expected pesticide residues that weren't environmentally hazardous.²⁰

84. Project resources were used in a cost-effective manner and have leveraged cost-sharing contributions and parallel financing from the private sector and Government of the Netherlands. Project inputs were delivered on time in most cases and, with few exceptions, there were no major delays in disbursements.²¹ The final project report highlights a positive relation of expenditure to outputs. The level of achievement of some outputs (i.e. number of monitoring samples, publications and farmers trained) surpassed the numbers initially planned. Another measure of cost-effectiveness was the extension of project timelines within the approved budget, although in some cases budget cuts limited the resources available for demonstration and validation of GAP results according to the implementors, as for the institutionalization of project results.

A.4 Review of Outcomes to Impact (Theory of Change)

85. As applied to UNEP evaluations, "Theory of Change" (TOC) depicts the logical sequence of desired changes (called "causal / impact pathways" or "results chains") to which the project is expected to contribute. It shows the causal linkages between changes at different results levels (outputs, outcomes, intermediate states and impact) and identifies the factors influencing those changes. The reconstruction of a TOC can help identify linkages between outputs and outcomes, and the intermediary states between outcomes and intended impact. It identifies the "impact drivers" that move implementation forward, and the "external assumptions" in project design that affect performance yet are often outside the project's ability to influence.

86. To a large extent, project performance and impact can be interpreted on the basis of causal pathways. The first component established conditions for project implementation by setting up the project regional coordination unit and institutional coordination arrangements. This was a requisite for achieving the planned outputs and outcomes proposed by the other project components. The drivers of well-articulated stakeholder involvement (through the PSC and NCCs) and effective on-schedule implementation have clearly influenced the project's progress towards all outputs and outcomes. The extended delay in the project's commencement led to changes in country situations and higher costs had direct bearing on the project readiness and start-up, as did the delays in revising work plans or approving demonstration projects in some countries. The assumption that countries would meet their financial commitments was undermined by shortfalls in Nicaragua's co-financing contribution that affected the project budget. Once the initial difficulties were overcome, the combined drivers of effective project management and PSC/NCC involvement were instrumental in moving the implementation process forward and applying adaptive management. The PSC and NCCs represented the main project decision-making bodies and have had significant influence on budget revisions, pre-programming of activities and project extensions.

87. Under the second component, the output of legislative and policy reform proposals was a requisite for achieving the outcomes of streamlined laws and regulations, and the

²⁰ Interview with Mr. Carlos Buzio, Executive Director of CropLife Latin America.

²¹ The exceptions noted to the evaluator were (i) disbursement gaps between contractual phases in Nicaragua and Costa Rica that required interim financing by the implementing institutions to ensure continuity; and (ii) delays faced by CIRA (Costa Rica) in receiving laboratory equipment that was purchased by CIRA with project funds.

elimination of conditions encouraging irrational pesticide use. This assumed that governments or national parliaments would indeed revise current legal and regulatory frameworks on the basis of the project's proposals, which did not turn out to be the case and was noted as a "critical assumption" by project document's logical framework. As a result, the intermediate state of "enhanced legal and regulatory frameworks that are enforced in MCB countries" was not reached, nor were national crop certification programmes approved.

88. National partner institutions such as AUGURA, CORBANA, CDC and PROAGROIN provided implementation capacity, training support, access to large numbers of growers, and already applied good practices to some extent. As such, they were strategically positioned to drive project training, awareness and demonstration activities. Institutional partners contributed decisively to the outcomes of demonstrated rational use of pesticides, validation of environmentally sound and economically feasible GAPs, and improved public awareness on conservation issues. Their performance validated the assumption of adequate partner capacity and commitment to implement activities and sustain changes. Training and awareness-raising outputs were also driven by effective implementation guidelines that were agreed by the three countries. The stakeholder involvement mechanisms linking the NCCs, PSC and RCU were drivers for improved public awareness on conservation issues.

89. Demonstration project design and implementation were successfully driven by the combination of high institutional capacities and commitment (a correct assumption) and effective, on-schedule implementation and disbursement. As a result, Colombia and Costa Rica have entered the intermediate state in which GAPs are applied and sustained by a critical mass of targeted farmers. Likewise, the promoting of GAPs that were suited to local crops and farming systems, addressed market demands and were (often) cost-effective, represented a key driver for reaching this intermediate stage. When approvals of demonstration projects or UNON disbursements were delayed, implementation activities were affected. As a result, some institutions (i.e. BICU) faced difficulties in sustaining demonstration activities with internal resources or synchronizing implementation with planting cycles.

90. The outputs of the third component sought to institutionalize monitoring and training activities beyond the project term. The establishment of the coastal monitoring programme was driven by the country consensus on a common monitoring protocol in addition to standardized methods. The assumption that national partner institutions would have adequate capacity and commitment was again correct, and the performance of the participating research laboratories (INEMAR, CICA, LARP and CIRA) were key drivers in achieving the monitoring outputs and related outcomes of identified contamination sources and improved public awareness. However, the coastal monitoring programme would lose momentum after the project's termination and the intermediate state of institutionalized coastal monitoring in MCB countries was never achieved, in part due to baseline findings of low pesticide runoff and contamination levels that are within international standards, and the (mistaken) assumption that governments would act on the project's proposals to revise pesticide legislation.

91. The most critical assumption (high levels of pesticide residues and runoff) supported the project objective and provided the basis for its design. The low baseline levels that were found at all sampling sites during the initial monitoring campaign was very good news, yet weakened the arguments on which the project justification was based. In addition, the limited scale of demonstration activities over short periods was insufficient to reliably correlate changes of pesticide residue levels with GAPs. Indeed, laboratory staff in the three countries considered that there was insufficient evidence to conclude that reduced pesticide applications or other project interventions have had noticeable effect on pesticide runoff or residue levels.

92. This analysis and the other sections of the report provide the basis for graphic representation of Theory of Change dynamics as applied to the project (Figure 2), impact

pathways (Figure 3) and the ratings of project performance according to the evaluation criteria that are presented in Figure 4.

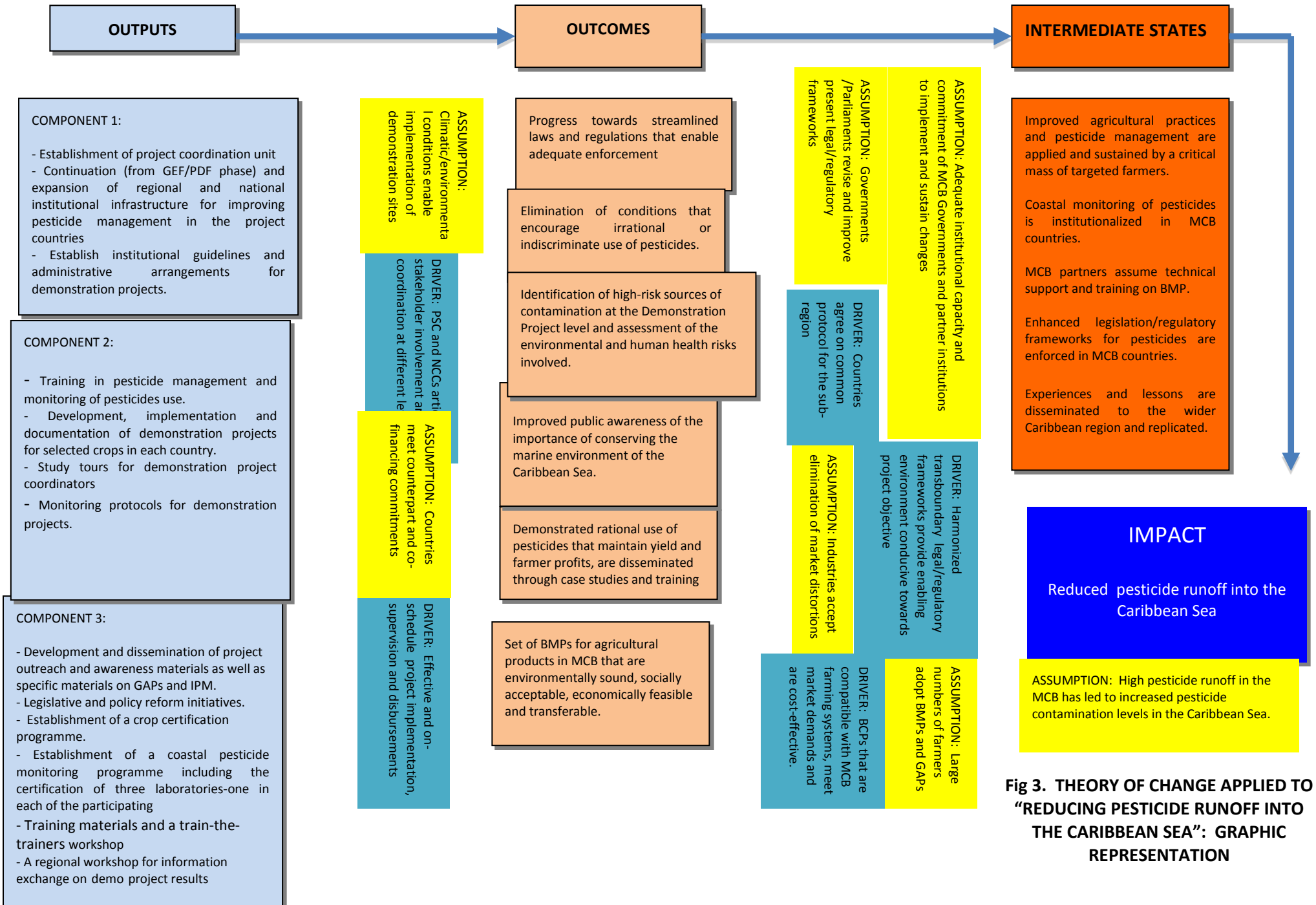


Fig 3. THEORY OF CHANGE APPLIED TO “REDUCING PESTICIDE RUNOFF INTO THE CARIBBEAN SEA”: GRAPHIC REPRESENTATION

Figure 4

Examples of Impact Pathways linking Outputs, Outcomes and Intermediate States

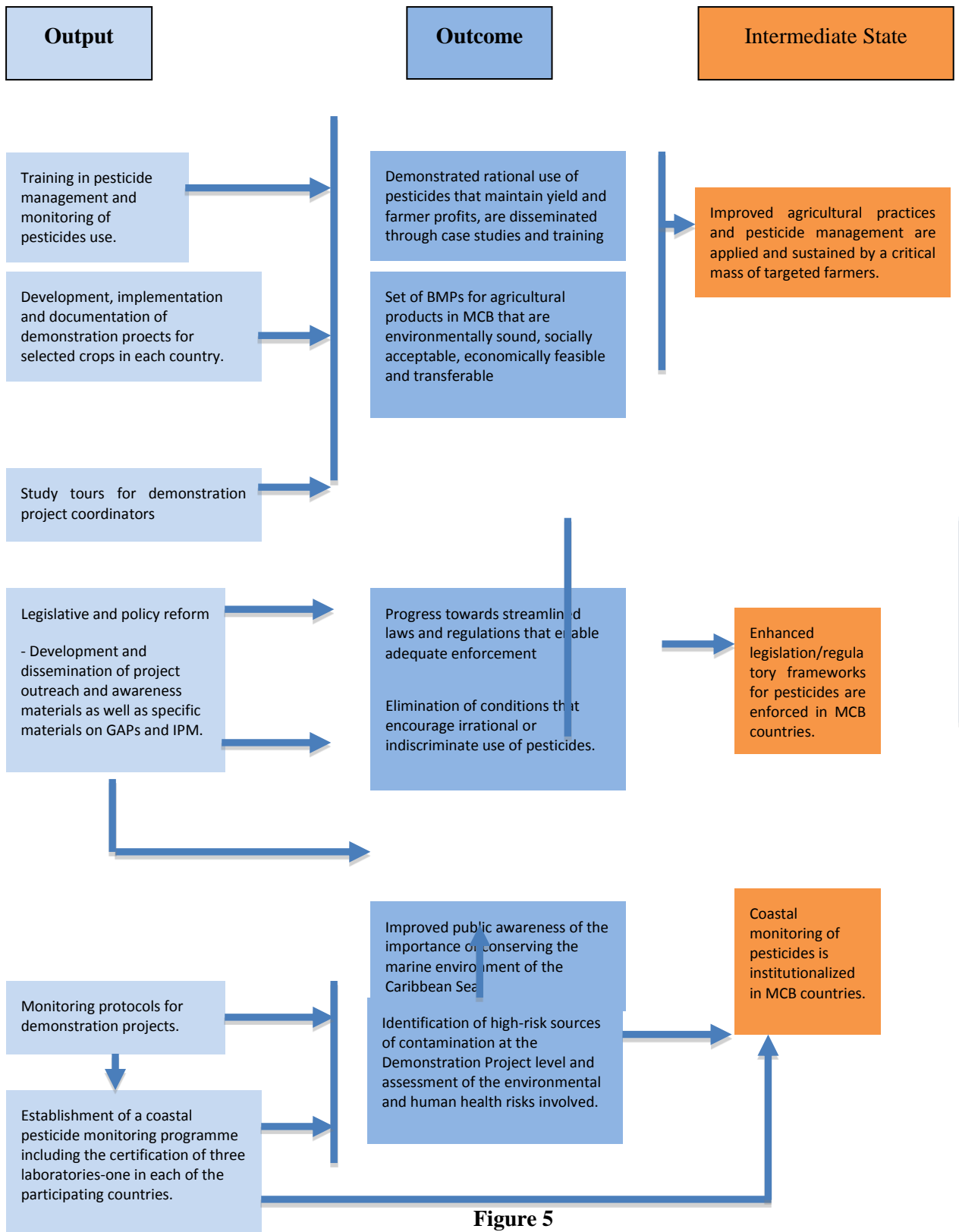


Figure 5

Project Performance Ratings according to the Evaluation Criteria

Rating Scale:

HS: *Highly Satisfactory*

ML: *Most Likely*

S: *Satisfactory*

L: *Likely*

MS: *Moderately Satisfactory*

UL: *Unlikely*

MU: *Moderately Unsatisfactory*

\ MUL: *Most Unlikely:*

U: *Unsatisfactory*

HU: *Highly Unsatisfactory*

Criterion	Summary Assessment	Rating
A. Attainment of project objectives and results	The project objective was based on the flawed assumption of high coastal contamination caused by pesticide runoff. Project interventions cannot be reliably correlated to reduced runoff or changes in pesticide levels. However, there was impact and the project was successful in most aspects. Most of the planned results were achieved.	S
1. Effectiveness	Same as above.	S
2. Relevance	Linking GAPs to market dynamics and economic incentives made the project extremely relevant to the needs and aspirations of most growers. The institutional capacity and quality of services offered by national research laboratories were permanently strengthened with the added benefit of ISO certification.	HS
3. Efficiency	The RCU, NCU and most national partners were very efficient in managing project activities, following a slow start-up phase. The hiring of project assistants helped considerably. Implementation in Colombia was considered exemplary and a model for future projects. There were delays in some contract approvals and financial disbursements.	S
B. Sustainability of project outcomes	There are indications of post-project continuity in GAP training and application in Colombia and Costa Rica.	HL
1. Financial	Sustainability is reinforced in	HL

Criterion	Summary Assessment	Rating
	Colombia and Costa Rica by economic incentives. International certifications for exporting banana and pineapple require good practices including low pesticide use. Training and GAPs are being continued by several national institutions with internal resources, and in some cases expanded.	
2. Socio-political	Enabling conditions for national certification programmes were lacking and require a longer – term commitment. The project was not positioned in terms of time and resources to influence national policies or regulatory frameworks, beyond giving catalytic support to ongoing policy advocacy processes.	L
3. Institutional framework	The institutional framework was built on existing networks and collaboration, helping the project’s insertion at the country level and encouraging national ownership. The capacities and commitment of the CRU and most national partners were commendable and critically important to the project’s performance.	HL
4. Environmental	There were no adverse environmental effects. Agricultural practices and IMP are still being applied with environmental benefits.	HL
C. Catalytic role	The project catalyzed the adoption of Gaps on a wider scale through effective demonstration and institutional partnerships.	HS
D. Stakeholders involvement	The PAC and NCOs have played a substantive role in project decision-making and adaptive management.	HS
E. Country ownership / driven-ness	Ownership and driven-ness were high among most national partner institutions, and NCUs improved considerably after slow starts in some countries. The hiring of project assistants for the NCUs significantly improved responsiveness and	HS

Criterion	Summary Assessment	Rating
	momentum.	
F. Achievement of outputs and activities	Almost all outputs and activities were fully achieved.	HS
G. Preparation and readiness	Very high among most national partner institutions that implemented demonstration, capacity building and monitoring activities. Project implementation in Colombia was considered “exemplary” and a model for other projects. The 8-year lag in the project’s commencement weakened readiness levels during the initial stages of implementation.	S
H. Implementation approach	The project strategy successfully linked environmental protection to market dynamics and economic incentives. This approach was innovative and a key factor to the project’s success.	HS
I. Financial planning and management	The approved budget contained several flaws that were signaled by the PSC and subsequently revised. There were delays in contract approvals and disbursements. However, financial planning and management improved during project implementation and resources were generally well managed. The project was extended by one year and performed efficiently within the approved budget.	MS
J. Monitoring and Evaluation	This rating is based on monitoring practices and not design. It addresses monitoring of project performance and effectiveness (and not the coastal monitoring programme).	S
1. M&E Design	A monitoring plan was not included in the project document. Monitoring provisions were vague and less developed than other project components.	MU
2. M&E Plan Implementation	A monitoring plan was not included in the project document. However, the RCU and UNEP CAR/RCU were very effective in monitoring and	HS

Criterion	Summary Assessment	Rating
	backstopping project implementation through continuous communications between the regional, national and sub-national levels.	
3. Budgeting and funding for M&E activities	The project document did not include funds for external evaluations, although arrangements were made during implementation.	MU
K. UNEP and UNDP Supervision and backstopping		S
1. UNEP	Excellent supervision and backstopping by the RCU and UNEP CAR/RCU, as reflected in adaptive management and effective implementation performance. The administrative support provided by UNON was sometimes slow in contracting and disbursing.	S
2. UNDP		N/A

B. Sustainability and Catalytic Role

93. One year after the project’s finalization, there are satisfactory levels of sustainability. The evaluation found overall high sustainability levels in Colombia and (to a lesser extent) Costa Rica due to supportive market incentives and institutional capacities; whereas post-project sustainability in Nicaragua’s Atlantic Coast has been more difficult given the geographic isolation, limited institutional presence, and predominance of small-scale subsistence farming systems. These findings resonate with the final project report’s assessment of sustainability potential for the three countries. In Colombia and Costa Rica, GAP training and several good practices (ground cover crops, IPM) have been sustained and expanded both in area and number of users by national partner institutions.

B.1 Socio-political Sustainability

94. Sustainability among targeted crop growers is largely driven by market incentives that require certifications of good practice for export and provide tangible economic rewards. Access to export markets and better prices are very effective drivers for continued GAP adoption, as reflected in the GlobalGAP certifications that have been issued to banana and pineapple growers since the project’s completion. The GAP promoted by the project have also enabled small-scale growers to qualify for certification from the Rain Forest Alliance, which has more stringent requirements and provides access to Fair Trade markets (that offer higher prices). Among banana cooperatives in the Madgalena region, one dollar of the income received for each box of bananas is retained by the cooperative and invested in a social investment fund that benefits affiliated growers and their families. These redistributive

“It’s a problem of institutional norms, not of resources.”

- A Costa Rican MINAET official referring to the discontinuity of coastal monitoring activities after the project’s termination.

mechanisms and the improvements they finance are important locally and contribute in sustaining the current arrangement. As long as export markets continue to require certification of good practices, the likelihood of continued GAP application will remain high. The cost savings derived from reduced applications of chemical pesticides also reinforce sustainability among growers, including small-scale farmers that cultivate beans and rice for domestic consumption.

95. The political sustainability of the project results via revised/streamlined policies and legal frameworks is less evident. The project supported the design of national crop certification proposals in Costa Rica and Nicaragua, and could offer substantive feedback to the reclamation of water resources legislation (*Ley de Recursos Hídricos*) recently approved in Colombia. However, national certification programmes - even when voluntary - are unlikely to be approved soon and must address institutional arrangements, financing mechanisms and domestic market incentives among other issues. At present there is no legislation that establishes limits or parameters of pesticide use, although all countries regulate importation. Costa Rica's Ministry of Agriculture has introduced norms for regulating pesticide applications to fruit, but national parameters are yet to be formulated for pesticide residues in water or soil residues. Proposed legal norms for the transport, handling and disposal of pesticides were drafted in Nicaragua and will be evaluated by the National Commission on Norms. Free trade agreements with North America and the EU indirectly reinforce the sustainability of good farming practices and rational pesticide use.

96. As noted earlier, none of the countries have ratified the Protocol Concerning Pollution from Land-based Sources and Activities (the LBS Protocol) of the Cartagena Convention, which requires that Parties develop national plans to prevent, reduce and control the runoff of pollutants from agricultural lands. The ratification of the LBS Protocol is an important enabling benchmark to sustain and replicate project results.

97. The Coastal Monitoring Protocol and programme provide a foundation for continued pesticide monitoring at the basin scale and collaboration between national research institutions. However, there have not been further monitoring campaigns involving the three countries since the project's termination. Sustained pesticide monitoring at the project sites will require external funding support in Nicaragua and revised institutional norms in Costa Rica. A step in this direction was taken in Costa Rica by supporting CICA in designing a national plan for sampling pesticide residues. Given the prevalence of low baseline levels that do not pose an environmental threat, the implementation of future monitoring campaigns may not be a policy or funding priority.

B.2 Financial Resources

98. One of the project's outstanding features was the link of sound pesticide management to international market requirements and economic incentives. This reinforced the sustainability of GAPs considerably. As noted earlier, banana, plantain and pineapple growers in Colombia and Costa Rica must apply good practices for GlobalGAP export certification. This involves periodic auditing to ensure compliance applied, and the grower assumes the costs for certification. Enterprises such as CORBANA, PROAGROIN and Colombia's banana cooperatives are intent on maintaining compliance, given that certification is awarded to the entire entity and any lapse by associated producers would endanger this. GAPs promoted by the project are more rigorous than those required by GlobalGap and enable small-scale producers to qualify for RainForest Alliance certification and access to Fair Trade markets that pay better prices.

99. The cost-effectiveness of various GAPs and IPM methods was demonstrated. In such cases, the reduction of pesticide and herbicide costs (i.e. from US\$ 2,300 to US\$ 1,700/hect. of bananas at CORBANA demonstration sites) represented important savings. Positive

benefit-cost relations clearly reinforce the sustainability of these practices. Other practices (such as mechanical control practices and polyethylene ground covers) were found to be more costly than conventional methods and are less likely to be adopted on a wide scale. The high cost and difficulty of obtaining kudzu *grass* and *frejol abono* discourages widespread adoption in Nicaragua's Atlantic coast.

100. The financial sustainability of project initiatives often depends on continued external support. A US\$ 17 million GEF project proposal (PIF) – “Improved management of agrochemical life cycles in the Caribbean and Central American region” – was drafted to consolidate project processes and extend GAPs to the Dominican Republic, Panama, Honduras, El Salvador and Jamaica. The proposal's stated objective is to curtail the release of agrochemicals to the Caribbean Sea through alternate land/crop/soil management practices, comprehensive management plans and other measures to mitigate the improper use of agrochemicals (including pesticides and fertilizers) in the agricultural and tourism sectors. The project was endorsed by the eight governments, UN agencies (UNEP CAR/RCU, FAO, PAHO and UNU) the Regional Centre for the Basil Convention, WWF and CropLife Latin America and submitted to GEF. At present the chances of short-term approval is unlikely and the proposal remains “on hold” following changes to the GEF Secretariat. Sustainability will have to continue relying on national funding, with support from other donors when available. In Colombia there are plans to replicate project experiences in Colombia's Tota Boyacá lagoon region with Conservation International, and among coffee growers with support from KfW (Germany).

B.3 Institutional Framework

101. Sustainability has been strengthened by the capacity and commitment of national partner institutions that implemented GAP demonstrations, capacity building activities and coastal pesticide monitoring. Several project partners are affiliated to CropLife Latin America and support the application of good practices to varying degrees. The project's association with established, large-scale production and marketing enterprises such as CORBANA, PROAGROIN, AUGURA and BANACOL raises the likelihood that GAPs will continue to be applied at demonstration sites and disseminated to producers.

102. There is evidence that this is happening. Improved practices that include use of leguminous cover crops and polyethylene in substitution of herbicides, the recycling of plant waste as organic fertilizer, and safe pesticide handling are being expanded by these institutions and incorporated to core technical extension and training activities. Colombia's Agrarian Society (SAC) offers discounts on crop insurance to members who apply GAPs on their plots. A certification programme for fruit and vegetables that includes good practices is planned by the EXITO supermarket chain (one of Colombia's largest). In Costa Rica, PROAGROIN will manage a credit programme next year that will incorporate GAPs as a requirement.

“No project can aspire to achieve sustainability with only one year of effective working time, and particularly so if this requires changes in cultural behaviour.”

- An interviewed project manager from BICU's Biodiversity Institute (Nicaragua)

103. In Nicaragua's Atlantic coast, the combination of geographic dispersion, funding constraints and comparatively lower institutional capacities have led to the discontinuity of demonstration, training and monitoring activities (aside from two cases of thesis fieldwork conducted by BICU students). The lack of follow-up to project activities may limit further dissemination of GAPs to bean and rice farmers. However, the promotion of some practices is foreseen under a new EU-funded project for climate change adaptation that will be implemented by BICU's Biodiversity Institute in collaboration with municipal

governments. Training materials developed by ICIDRI in Nicaragua and ANDI in Colombia are being applied to other projects and regions. Improvements in pesticide monitoring and analysis capacities among research laboratories have contributed to ISO certification and are likely to be sustained in the future.

104. Among participating public sector partners, INVEMAR has strong institutional presence and has extended the range of pesticide monitoring sites (applying the project methodology) to the Pacific coast. Costa Rica's Fitosanitary Service has 90 offices distributed throughout the country. The project's institutional arrangements have lost momentum since the project terminated and National Committees have ceased to meet as such (although many members continue to work bilaterally).

B.4 Environmental Sustainability

105. The monitoring of soil and water samples indicates consistently low levels of concentration throughout the project. While this cannot be attributed to the use of GAPs for the reasons mentioned previously, the measurable reduction in pesticide use is likely to lower residue levels over time and more so if GAPs are adopted on a wider scale. There are no negative environmental effects that stand to influence the sustainability of project results.

B.5 Catalytic Role and Replication

106. The project has played an important catalytic role that reinforces the likelihood of sustainability. The PDF phase and, subsequently the RCU have brokered scientific, technical and public-private partnerships that built on existing institutional networks and collaboration processes. GAP training and demonstration activities were explicitly intended to encourage adoption and application on a wider scale. This was accomplished by (i) training technical staff and demonstration farmers; (ii) facilitating farmer-to-farmer extension on the demonstration sites; and (iii) establishing partnerships with leading producer and marketing enterprises that offered implementation capacity and were strategically positioned to expand GAPs to more producers and wider extensions of cultivated land. There is continuing and, in some cases, expanded use of IPM methods by cooperatives and enterprises in Colombia and Costa Rica that are reaching associated growers; and possibly among small scale *miskito* farmers in Nicaragua's RAAN as well. The transfer of GAPs to banana, plantain and pineapple growers has catalyzed economic returns in the form of cost savings from lower pesticide applications, certifications of good practice for export markets, and better prices.

107. In Nicaragua, the project provided an (infrequent) opportunity to shift the attention of government and academia from the Pacific to the Atlantic Coast. This was an important advance considering that over 90% of Nicaragua's inland water bodies flow to the Caribbean. The project enabled ICIDRI of Managua's National Polytechnic University to work in the Atlantic region for the first time. It was also CICA's first experience in working with agricultural producers in the field.

108. A very strong catalytic effect was establishing a framework for regional coastal pesticide monitoring that applies common baseline data and analytical methods among national research institutions, and provides a foundation for continued cooperation. Training and equipment provided by the project have enabled laboratories to analyze a wider range of pesticide molecules, contributing to ISO17025 certification. This expands the range and quality of services offered to clients, which represent an important source of institutional income. Since the project's termination, the equipment acquired for CIRA in Nicaragua was used to analyze pesticides, hydrocarbon residues and organic contaminants for five external projects and studies.

109. The project successfully leveraged significant levels of co-financing from country partner institutions and catalyzed complementary support from the donor community. Demonstration activities within Colombian banana cooperatives have leveraged parallel funding of EUR 1.5 million from the government of Netherlands, to extend GAP infrastructure to smallholder parcels. Agreements were reached with the University of Zurich (Switzerland) to develop a project for mitigating the health risks of pesticides on agricultural workers. INVEMAR has extended pesticide monitoring to the Pacific coast and has plans to measure pesticide residues in other crops. The Agrarian Society of Colombia (SAC) offers crop insurance discounts to banana growers who apply GAPs; this could expand their application to a significant segment of the sector. There are plans to replicate demonstration and training activities in Boyacá and among coffee growers with funding from Conservation International and KfW (Germany). BICU's Biodiversity Institute expects to replicate project practices under a new project on climate change adaptation (funded by the EU) that will be implemented in Kukra Hill with the municipal government.

C. Processes affecting the Attainment of Project Results

C.1 Preparation and Readiness

110. The project was well designed in spite of a few budget omissions that were corrected, and unrealistic timelines for some outputs. The approach outlined in the project document offered satisfactory levels of preparation and readiness that were subsequently weakened by extended delays in project approval and slow start-up. The project's objective and main components were clearly articulated. However, the general objective and some outcomes and outputs (i.e. revision of policy and legal/regulatory frameworks) were outside the project's control and conditioned by external variables.

111. The project benefitted in preparation from the PDF-B phase (1999-2000) that included broad consultations in the three countries. This preparatory phase allowed UNEP to identify and develop (through the RCU) working relations with established national institutions that had internal capacity, understood the project's rationale, and were well positioned to carry the implementation process forward. In several cases, partner institutional capacities contributed decisively to project performance at the country level that was "exemplary" in Colombia, offered "impressive" results and offered a model for effectively addressing pesticide runoff.²² CropLife International's influence on the project from its initial planning stages was critical in shaping an implementation approach that benefitted from market incentives and private sector linkages. It also provided access to affiliated enterprises and organizations that are recognized players in their respective sectors. This strengthened the project's readiness, strategic positioning, and ability to move forward in the three countries.

112. There were also aspects of project's design and start-up that reflected a lack of foresight and preparedness:

- In retrospect, the general objective of reducing high pesticide runoff levels to the Caribbean Sea was based on unrealistic assumptions. Baseline monitoring revealed low pesticide residue levels that were well below those reported previously by WWF. Consistently low levels were found at all sampling sites, including those where "conventional" farming practices had been applied. However, this was a positive change in scenario that shifted project's primary emphasis from mitigation to prevention.

²² Quoted from the findings of the Mid-Term Evaluation report (LAGA, 2009), pg. 31

- Project timelines were unrealistic. Project design underestimated the time needed to set up the project, negotiate institutional arrangements in three countries, influence policy frameworks and validate demonstration projects in coordination with diverse partners. These oversights weakened project readiness and – combined with the late start – prompted the need to re-programme country activities and extend the project by one year. According to interviewed implementors the combined research, demonstration and validation activities required a minimum of 3 years or more in order to cover at least two plant cycles and generate solid results. In practice, demonstration projects were implemented over a two-year period in Colombia and Costa Rica, and one year in Nicaragua (barely enough to cover one cycle).
- The seven-year gap between project design and commencement and delays faced in starting demonstration activities, undermined the level of preparation that had been reached at the end of the PDF. There was need to update and revise work plans, reformulate demonstration projects and adjust country budgets to current exchange rates. There were further delays in confirming country co-financing contributions and appointing national coordinators. Extended efforts were made to include Panama in the project, which in the end were unsuccessful. The recruitment of project personnel was very slow in some cases. The project was extended to compensate for the late start and delays; however, the budget revisions approved for this purpose reflected cost increases and some budget lines were consequently reduced. This has affected some demonstration activities and the time/resources available to institutionalize project results and influence policymaking.
- As noted elsewhere, the achievement of the general objective and some of the planned outputs and results were outside the project’s realistic possibilities. The scale and duration of demonstration activities undermined the cumulative effect needed to reduce pesticide runoff to the Caribbean Sea. According to the research laboratories that conducted the monitoring analyses, the low pesticide levels found at sampling sites cannot be correlated with changes in practice or behaviour resulting from the project. Likewise, conditions were lacking to have significant impact in reforming national policy and legal frameworks. The indicator for this outcome - “recommendations implemented by national governments” – and corresponding outcomes required time, resources and commitment that were outside the project scope. There were attribution issues as well. As designed, the project could not be held accountable for the revision of policy or legislation, nor was it equipped to do so. The logical framework recognized that getting governments to revise and improve the legal framework was a “critical assumption.”
- The NEX modality placed country implementation and coordination responsibilities on national coordination units located within environmental ministries. They were initially unprepared to fully meet project demands due to staff limitations and other work pressures. The decision to recruit project assistants for the RCU and three NCUs had a significant impact by enabling national coordinators to focus on substantive issues and strengthening coordination and responsiveness.

C.2 Implementation Approach and Adaptive Management.

113. The project implementation strategy was very well conceived and has been an essential driver of project performance and impact by articulating an integrated, multi-tiered

approach to pesticide management. This approach recognized and addressed the technical, institutional and systemic issues the project was likely to face. Environmental conservation and pesticide management were linked to market dynamics and economic incentives through public-private partnerships. Technical assistance, training and demonstration activities were combined and delivered in a manner that was producer and market-friendly.

114. Demonstration and training activities were implemented by producer and marketing enterprises that are leaders in their sectors, in partnership with organizations that had rural training experience and academic institutions. This has been a key determinant of project success that strengthened the project's relevance and didactic value by demonstrating effective approaches to working with the private sector. There were also lessons derived from the implementation of demonstration sites and capacity building among indigenous communities in Nicaragua's RAAN that practice small-scale farming for family consumption.

115. The project's institutional framework was built around existing networks and collaborative processes. There had been prior regional cooperation between INVEMAR, CICA and CIRA. AUGURA already provided technical assistance to important segments of Colombia's banana and plantain sectors. Large-scale enterprises such as CORBANA, PROAGROIN, BANACOL and CDC accounted for a significant share the targeted crops produced in their countries. They all applied combinations of good practice that met GlobalGap certification requirements, as well as core training and extension activities. The enterprises were therefore well placed to extend GAPs (including their own) on a wider scale. The selection of recognized and strategically-positioned institutional partners that understood the project approach was a key decision that aided the project insertion in the three countries, raised effectiveness levels and encouraged national ownership.

116. The extended delay in the project's commencement tested adaptive management capacities at an early stage of project implementation with positive results: Work plans were revised, demonstration projects were redesigned and costs updated. Revisions to project timelines and budget allocations were developed by the RCU in consultation with NCUs, NCCs and the regional Project Steering Committee. Four budget revisions were approved during the implementation period and the project was extended by one year. The support of UNEP CAR/RCU to periodic project adjustments and revisions is recognized as a contributing factor to the project's adaptive management.

117. The RCU responded to the findings of the Mid-Term Evaluation and took action on several. Evaluation recommendations were discussed with the regional Project Steering Committee (PSC) and National Coordination Committees (NCCs). The recommendations that were implemented by the project include the project's extension; additional regional meetings for exchanging experiences and sharing lessons (San Jose in 2010, Cartagena in 2011); meetings of panels of experts (Managua in 2010, Kingston in 2011); and design of a new proposal to expand project activities to the wider Caribbean region.²³

C.3 Stakeholder Awareness and Public Participation

118. The institutional arrangements provided opportunities for interaction between regional and national stakeholders that were involved in formulating and implementing the project components. The preparatory PDF phase (1999-2000) supported broad consultations that shaped the project's design and implementation strategy. The subsequent creation of regional and national committees with public/private institutional representation generated substantive participation opportunities by establishing communication channels that improved the project's responsiveness and adaptability to changing contexts, and encouraged national

²³ GL 4880 Final Report, Annex 4 (2011)

ownership. The Project Steering Committee (PSC) and National Coordination Committees (NCCs) were the project's primary decision-making bodies and vehicles for ministerial cooperation and public-private partnerships. They have played an important supportive role. Decisions on budget revisions, project extensions and project implementation guidelines were consulted with and endorsed by the PSC and NCCs. The PSC met on four occasions prior to the final regional workshop, and the reports of these meetings are on the UNEP CAR/RCU website.

119. The enabling conditions for stakeholder participation were very much influenced by the responsive attitude displayed by the regional project coordinator and UNEP CAR/RCU. Many interviewees praised the RCU's ability to manage parallel implementation processes and maintain open channels of communication with national partners. The predisposition of the regional project coordinator to consultation and dialogue has been a key driving factor for participation. Ex-NCC members recalled frequent communication and consultations on diverse issues; one jokingly referred to the level of participation as "exhausting." The regional workshops captured the feedback of country participants at different levels, adding depth and insight to the systematization of project experiences and lessons.

120. Public awareness was built into demonstration projects and training activities. Demonstration activities were planned and executed with the explicit intention of influencing behaviour and practice on a wider scale. The reported figures indicate that a large number of growers²⁴ were exposed to project training and awareness-raising. Training materials on GAPs including IPM and biological control were published for each crop and are available on the website. Public awareness materials such as posters, flyers, videos and promotional materials were disseminated in the three countries.

C.4 Country Ownership and Driven-ness

121. The project implementation approach and participation mechanisms provided enabling conditions for national ownership. Ownership was nurtured from the PDF phase with government partners as well as with research institutions, universities and established crop production and marketing enterprises. Indeed, ownership was reinforced by process and content: Project design and implementation arrangements were based on stakeholder consultations held during the PDF phase. Country coordination responsibilities were assigned to National Coordination Units located within environmental ministries, and implementation contracted to national partner institutions. Several partners had already applied good practices for certification and access to export markets, and therefore had a direct stake in the project's success.

122. The project's ability to broker public-private partnerships between government ministries, agricultural enterprises, research institutions and academia strengthened national ownership as well. National partners perceived the project as a resource that supported their core mandates and goals. This raised commitment and created opportunities for institutional cooperation that would have been more difficult to realize outside of the project framework. As described earlier, National Coordination Committees were important decision-making bodies that articulated the institutional stakeholders, influenced crop and demonstration priorities, and played an active role in adjusting project work plans budgets to changes in country situations that resulted from extended delays.²⁵

²⁴ In addition to technical staff, extension personnel and pesticide distributors.

²⁵ Likewise, the regional Project Steering Committee (PSC) included country representation, and played a decisive role in signalling budget and design deficiencies during its first and second meetings that were subsequently reflected in a budget revision.

123. The combination of market incentives, economic benefits and cost savings encouraged ownership among producer associations in Colombia and Costa Rica. Whereas in Nicaragua's northern autonomous region (RAAN), ownership at the community level was driven more by cost savings and improved food security resulting from GAPs. The project strategy was consistent with government conservation and rural development policies for the Atlantic regions; and offered an opportunity for "on the ground" collaboration between national and local institutions in a difficult, geographically isolated operating environment.

124. National ownership and commitment was not always reflected in institutional performance, which was influenced by capacity levels, resources availability and facility of access to demonstration sites (especially in Nicaragua). Project start-up was slow, and the motivation of national partners had declined following the 7-year lag between project design and implementation. UNEP CAR/RCU and the regional project coordinator were faced with challenge of re-building stakeholder motivation and fostering ownership.

125. Country ownership was more evident operationally and institutionally than politically. The LBS Protocol wasn't ratified by any of the three countries. The results achieved in influencing legal and regulatory frameworks for pesticide management were lower than initially expected, albeit affected by external factors outside the project's control. Proposals for national certification programmes and the establishment of parameters for pesticide applications need to address a number of issues before they are viable.

126. National ownership was clearly reflected in budget terms by country co-financing contributions that reached US\$ 9.8 million (of which US\$ 7.6 million came from non-governmental partner institutions), representing 72% of the US\$ 15.4 million budget. Indeed, the increases to the initially approved budget of US\$ 9.9 million were entirely financed through co-funding, as the GEF grant remained the same. Co-financing by national partners that implemented demonstration, capacity building and coastal monitoring activities exceeded the initially targeted figures, underscoring their commitment to the project. There were initial shortfalls in the project co-financing contribution from the Nicaraguan government (subsequently compensated to a large extent).

C.5 Financial Planning and Management

127. The RCU and Project Steering Committee were effective in managing the budget and responding to emergent needs: Expenditures were successively re-programmed, budget lines adjusted to changing circumstances, significant levels of additional co-financing were mobilized, and budgetary oversight was provided. Financial capabilities were tested early into implementation. Budgets estimations for project activities during the PDF phase (1999-2000) were outdated and in many cases obsolete by the time the project started in 2007. In particular this affected the budgeting of country activities that relied on co-financing in national currencies that were weakened by fluctuations in exchange rates.

128. The first and second PSC meetings identified the following deficiencies in the approved project: ²⁶

- The allocation for supporting the National Coordination Units was lacking.
- Project management costs were underestimated (L3 instead of L4).
- Allocations for consultants in different topics were higher than required.
- The appropriate budget for demo sites had not been adequately considered.

²⁶ Mid-term Evaluation Report (LAGA, 2009) pg. 26

- A significant part of the budget for coastal monitoring was included in 3.1, but could have been considered a separate budget component.
- The executing agency overhead fee was too low and should be 8%.
- The budget for meetings was not appropriate.
- Funds were not budgeted for external project evaluations.

129. These observations led to the following recommendations that reflected in-depth discussions by the PSC, and shaped the project's first budget revision (approved in May 2008):

- To increase the budget for project management, including the hiring of technical assistants for NCUs and adjusting overall project management costs to current levels.
- To reduce the budget for consultants. The idea was to channel funds and technical work as much as possible through national implementing agencies as a way of increasing ownership and strengthening local organizations.
- To prepare and implement demonstration projects without reducing allocated funds, it was decided that each project would include training for farmers and technicians. The budget for each project was set at \$515,000 per country. Around a quarter of this was earmarked for subcontracting the monitoring of pesticides runoff.
- To operationalize the coastal environmental monitoring programme as a separate project component, given its links to overall project activities. The total budget for the programme was \$675,000 for the three countries.
- To review the scope and extent of the establishment of the crop certification programme and to reduce the corresponding budget. Support will be given to existing certification schemes, preferably national ones.
- To adjust the overhead for UNEP CAR/RCU to nearly 8%. This overhead should cover all direct and indirect CAR/RCU costs, with the exception of the project manager and administrative assistant. It supports CAR/RCU personnel, travel and office costs.
- To re-programme the budget to the end of 2010.
- To revise the budget, trying to maintain the amounts budgeted for the project countries.²⁷

130. There are other examples of good financial planning and management. As mentioned, our budget revisions were approved and the project was twice extended for six months periods, without changes to the GEF contribution. Implementation activities were sustained in Nicaragua in spite of shortfalls in the government's co-financing contribution and delayed disbursements to demonstration projects. As noted in the previous section, the scale of co-financing resources mobilized by national project partners exceeded the initially planned figures. The ToRs for the PSC included supporting UNEP-CAR/RCU in fundraising efforts when necessary. Likewise, NCCs functions included assisting the National Project Coordinator in mobilizing in-country resources.

131. Despite the competent performance of the RCU and PSC in managing the project budget, correcting the initial budget deficiencies and funding the project's extension required budget cuts that affected some of the demonstration projects and prompted project extensions. Implementation was also affected in some cases by delayed disbursement of project funds. This did not affect performance when implementing institutions had the liquidity to provide interim financing and proceed with implementation. In Nicaragua, BICU faced difficulties in sustaining project momentum during the period it took to receive the second contract disbursement, and was obligated to divert resources from other university programmes to avoid disruptions. A motorcycle that was initially included in BICU's demonstration project budget was eliminated and subsequently purchased with university funds to provide a means

²⁷ Idem.

of field transport. According to UNEP CAR/RCU, slow project formulation and reporting by BICU was also a contributing factor. The delays also undermined the scheduling of demonstration activities with the start of the agricultural cycle. In Colombia, fluctuating exchange rates between the peso and dollar led to budget deficits; additional funds were sought and eventually raised from other sources.

C.6 Monitoring and Evaluation²⁸

132. Monitoring was one of the weaker aspects of project design. The GEF Council meeting that approved the project noted that its monitoring strategy needed more detail as well as “key indicators”. The project document did not include a monitoring plan, although a meeting of the regional project advisory panel were planned to develop one. Monitoring provisions were not as developed as other aspects of project design. The project document did include a list of practice, pesticide and environmental indicators that were to be used in monitoring demonstration projects. The monitoring of environmental and socio-economic conditions at demonstration sites was also foreseen under sub-component 2.1 “Demonstration Project Preparation” and a list of relevant monitoring data sources were annexed to the project document; the 2009 Mid-Term evaluation found this approach used to be technically sound.

133. A surprising oversight was the absence of budget allocations for external mid-term and final evaluations in the project document, although they were scheduled in the work plan. To its credit, the project subsequently budgeted for and met its evaluation requirements, albeit with limited resources. A Mid-term Evaluation was held in 2009; the report provided substantive analysis of project performance and progress, and made recommendations that influenced the following budget revision that extended the project.

134. Actual monitoring practices were proactive and influenced more by attitude and communication than a particular methodology. Internal monitoring of project implementation by the RCU has been constant and effective. The regional project coordinator and project assistant were very well informed on the progress of implementation in the three countries, as reflected in the adaptive management that was applied and in project reports that show more analytical depth than is often the case in project reporting. There was general compliance in submitting periodic progress and financial expenditure reports, in some cases with difficulty due to unfamiliarity with UNEP and GEF formats.

135. Monitoring was not segregated from overall implementation and was built into the coordination framework that linked the RCU to the national and sub-national levels where country activities were implemented. There were regular communications with NCUs and national implementing institutions that were contracted directly by UNEP. The NCUs were also involved in monitoring demonstration projects; particularly after project assistants were hired in the three countries. Impact monitoring was aided by the analysis of soil and water samples for the coastal monitoring programme. There are quantified reductions in pesticide use as a result of GAPs and changes in pesticide levels (that were already low). However, laboratory technicians considered that reductions in pesticide residue levels at sample sites could not be correlated with the effects of GAPs due to the limited scale and duration of demonstration activities, the influence of other crops in the area, and climate (the Nicaraguan coast was affected by excessive rains during the project’s initial stage). Making the correlation was further impeded by the discontinuity of coastal monitoring activities in Nicaragua and Costa Rica after the project’s termination.

²⁸ This section refers to the monitoring and evaluation of project performance and impact, and not the coastal monitoring programme.

C.7 UNEP Supervision and Backstopping

136. Payments to contracted institutions and purchase of equipment were made by UNON's Budget and Financial Management Service, based in Nairobi. All equipment was purchased directly by the project partners. Although the overall effectiveness of project implementation and management were indicative of satisfactory UNEP and UNON performance, implementation was initially affected by budgeting errors in the project document, and subsequently by delayed disbursements to some of the contracted institutions. Key omissions such as the absence of a budget for external evaluations, the underestimation of management costs or insufficient agency overhead fees should have been detected during the internal appraisal that is mandated before approval. Some of the project contracts were also delayed. The mid-term evaluation noted expressed concerns that UNON had made mistakes in the transfer of funds, "...wiring funds to incorrect accounts or in the incorrect currencies, confusing vendors."²⁹ However, flaws in the financial documentation provided by contracted institutions reinforced some of the delays and processing errors. The final project report has also made critical observations concerning the flexibility and timeliness of the administrative support provided (see box).

"Administrative procedures in UNEP [are] not always flexible and able to respond quickly to changing demands."

"Time was lost between the signing of contracts and first disbursement, when the partner has no financial resources to support initiation."

"More efficiency in timely contracting of personnel is needed, both by UNEP and the implementing agencies."

- GL4880 Final Report

137. UNEP CAR/RCU provided management, administrative and backstopping support that were appreciated by the regional project coordinator and interviewed NCU members. Examples of this include extensive efforts made to incorporate Panama into the project; the supportive attitude towards budget revisions and project extensions; the contracting of project assistants that significantly improved project coordination and efficiency; frequent communications with the RCU and contracted national partners; and the perseverance displayed in accommodating co-financing shortfalls and start-up delays in Nicaragua and (to a lesser extent) Costa Rica. UNEP CAR/RCU assigned an administrative assistant and part-time programme officer to

support the project when implementation was lagging, and provided consultancy support to Nicaragua for the review of documents. It has demonstrated flexibility and responsiveness by supporting different country priorities and implementation approaches, combining market-driven initiatives in Colombia and Costa Rica with Nicaragua's approach that focused more on food security and community development in the autonomous regions.

138. The corporate practice of dividing contract disbursements into two payments (75% upon the signature and 25% with the submission of deliverables) offered an effective means to protect project funds and encourage effective performance by contracted institutions. However, implementation was affected when disbursements were delayed and the implementing institution lacked the financial liquidity to provide interim funding, as occurred with BICU).

D. Complementarity with UNEP, UNDP and UNIDO Programmes and Strategies

139. In its design and implementation approach, the project complemented environmental agreements and programmes supported by UNEP. The project objective was consistent with UNEP's 2012-2013 Programme of Work and the GEF Strategic Priority Objective for trans-

²⁹ *Mid-term Evaluation Report* (LAGA, 2009), pg. 20

boundary actions on international waters concerns. It also related to the GEF-4 POP Focal Area (Reduce and eliminate production, use and release of POPs) and in particular the POPs Strategic Programme “Strengthening Capacities for NIP Implementation.”

140. The project implemented provisions of the Cartagena Convention - for which UNEP CAR/RCU serves as the designated Secretariat - and specifically the Aruba Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol) that requires Parties to develop national plans to control and reduce runoff of pesticides and other agrochemicals. The project design provided inputs to the formulation of the 2002-2003 work plan of the Caribbean Environment Programme’s AMEC sub-programme.

141. Collaboration was foreseen with several GEF projects in the region that were implemented by UNEP. Among these were “Sustainable Management of the Shared living Marine Resources of the Caribbean Large Marine Ecosystem (CLME) and Adjacent Regions” and “Integrated Coastal Management with Special Emphasis on the Sustainable Management of Mangrove Forests in Honduras, Guatemala and Nicaragua.”

142. The implementation strategy applied a basin-wide focus and integrated the monitoring of soil, fresh and saltwater samples under the coastal monitoring programme. In some respects it was complementary to the IW-CAM (Integrated Watershed and Coastal Management) approach that was developed by UNEP and implemented in several countries of the wider Caribbean region. Project experiences were shared with other GEF projects at International Waters Conferences and project meetings, and with other UN agencies at the regional meetings. Project results have been disseminated through the regional IWRN and CEPNET networks, and the global IW-LEARN network.

3. CONCLUSIONS AND RECOMMENDATIONS

3.A General Conclusions

143. *This has been a successful and effective project.* The implementation approach and institutional arrangements were innovative and have methodological value for future projects. Environment and economics were intrinsically connected and produced synergies that are reflected in the results achieved. The project’s efforts to promote integrated pest management and lower pesticide use were reinforced by export market requirements and associated economic benefits. These linkages were fundamental in driving the adoption and application of GAPs by growers in the three countries, and encouraging continuity through national partner institutions.

144. *The project attained most of the planned outputs and results, and generated the enabling conditions to sustain them.* GAPs were validated and significant reductions in pesticide and herbicide applications were achieved at demonstration sites, with cost savings associated to the use of ground covers, natural insecticides and the recycling of plant waste. This has benefitted large-scale enterprises and cooperatives in Costa Rica and Colombia by facilitating Global Gap certification for banana and pineapple export, as well as small-scale farmers devoted to food production for family consumption in Nicaragua. Although some of the practices disseminated have limited viability for smaller producers due to cost factors or input availability, interviewed national partner institutions and individual growers were highly positive in their assessment of the demonstrated practices and training received. In several cases GAPs and training activities are continuing and/or being expanded by national partner institutions. The results that were achieved through the combination of on-site demonstration, capacity building and farmer-to-farmer extension underscore the catalytic value of the project’s interventions.

145. *Despite the achievement of most planned outputs and results, there is no evidence that the project has made a difference in relation to the general objective of reducing pesticide runoff to the Caribbean Sea.* The effects of GAP applications on demonstration sites could not be correlated to reductions in the level of pesticide runoff or residual levels. Diminutions in pesticide concentration were detected at several monitoring sites. However, changes in baseline pesticide levels could not be reliably attributed to the short-term effects of GAPs due to (i) the limited number, scale and duration of demonstration projects; (ii) the scheduling of monitoring campaigns during early stages of GAP demonstration; (iii) the effects of climactic factors on pesticide concentration levels; and (iv) consistently low baseline pesticide levels at demonstration sites that were within international standards and did not differ between conventional methods and GAPs. A measurable impact will require the broader adoption of GAPs and inclusion of more pesticide-intensive crops, periodic monitoring of pesticide levels, and continued support for training and demonstration by national institutions.

146. *The overall quality and effectiveness of project implementation was impressive and reflected a commendable performance by the Regional Coordination Unit and national partners, despite asymmetrical implementation processes between countries and differences in institutional capacities.* The consistent support provided by UNEP CAR/RCU was another contributing factor. There were administrative delays in the approval of contracts, the re-design and approval of demonstration projects, and late disbursements that affected some of the demonstration activities. However, the monitoring, communication, adaptive management and “quality control” applied by the RCU were drivers of project efficiency and effectiveness, and contributed decisively to successful implementation.

147. *The project was well designed in spite of initial budget flaws and unrealistic timelines for achieving the objective and some outcomes.* The project objective was clear and supported by three components of activity that were interlinked. The implementation strategy articulated an integrated, multi-tiered approach that addressed the technical, institutional and systemic barriers the project was likely to face. Project design clearly benefitted from the preparatory PDF Phase (1999-2000) that held broad consultations with country stakeholders. Although the assumptions of high pesticide runoff and coastal contamination levels were subsequently disproven by monitoring findings - and the achievement of the main objective outside the project’s possibilities - this did not weaken relevance, performance or country-level impact. The seven-year lag between the project design and commencement considerably weakened levels of preparation and readiness; however, this was mitigated through the re-programming of activities, substantive design adjustments to demonstration projects, and budget revisions that demonstrated effective adaptive management by the Regional Coordination Unit, Project Steering Committee and national partners.

148. *The institutional arrangements improved the project’s strategic positioning and ability to generate results.* Institutional arrangements were built around existing networks and collaborative processes, facilitating the project’s insertion at the country level and ensuring compatibility with ongoing initiatives and institutional priorities. The preparatory phase enabled UNEP to identify established national institutions that had internal capacity, understood the project’s rationale, and were well positioned to carry the implementation process forward. This encouraged national ownership and commitment, in addition to public/private partnership opportunities. An indicator of this was the high level of co-financing provided by country partners for demonstration projects, training and coastal monitoring. The capacity and performance of key national partner institutions contributed decisively to the achievement of project outputs and results, and enabled the project to reach larger numbers of producers and extensions of cultivated area. Examples included the cooperation of national research laboratories under the coastal monitoring programme, and

the collaboration between ministries, crop production and marketing enterprises, cooperatives, universities and laboratories for demonstration projects.

149. *The establishment of National Coordination Committees and the regional Project Steering Committee opened channels of communication that linked project components as well as key institutional actors at the regional and national levels.* The PSCs and NCCs have supported the RCU and National Coordination Units by facilitating institutional collaboration, leveraging financial and in-kind support, and providing oversight to implementation process. Both levels combined advisory and decision-making functions, and contributed substantially to the re-programming of project activities, budget revisions and adaptive management in general.

150. *The project generated significant improvements in the pesticide analysis capabilities of participating national research institutions.* The provision of training and equipment expanded the range of pesticide analysis and directly contributed to ISO17025 certification for pesticide tests covering different matrices. The project's catalytic effects were reflected in the approval of a coastal monitoring programme and monitoring protocol that standardized analysis methods, established monitoring sites across the MCB, and generated baseline data on pesticide residue levels that is methodologically consistent and comparable between countries. In part due to the low baseline levels of pesticide residues that were detected during the monitoring campaigns, the coastal monitoring programme lost momentum and there have not been regional monitoring campaigns involving the three countries since the project terminated, although pesticide monitoring is continued by INVEMAR in Colombia and has been extended to sites on the Pacific Coast applying the same methodology.

151. *The project had less impact on national policies and legal/regulatory frameworks than was initially planned.* Catalytic support was provided to drafting proposals for national crop certification programmes and streamlining pesticide legislation among other activities. However, these initiatives have not led to the approval of new policies, laws or the revision of existing frameworks, although opportunities remain in the three countries. The limited impact achieved in this respect reflected more on project design than performance; the associated outputs, outcomes and indicators were largely outside the project's attribution, timeframe or budget possibilities. The project's logical framework noted that getting governments to revise and improve their legal frameworks was a "critical assumption" that depended on legislative or executive action. None of the countries have ratified the Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol), despite the efforts of UNEP CAR/RCU and the project's contributions to the implementation of provisions related to the Cartagena Convention and LBS Protocol in particular.

152. *The likelihood of further GEF support is uncertain at present.* Towards its final stages, the project designed of a follow-up proposal – "Improved Management of Agrochemical Life Cycles in the Caribbean and Central American Region" - that builds on the implementation approach and extends improved pesticide management to eight countries. However, the project's approval is uncertain and, according to UNEP CAR/RCU, the proposal is on standby following changes in the GEF Secretariat. Although the proposal was designed with feedback from the PSC and NCCs – and the indicative grant amount exceeds US\$ 17 million - there are concerns that the project's scale could generate diseconomies by fragmenting resources, lowering responsiveness to country needs and raising coordination and administrative support requirements considerably. Given the present scenario, the consolidation and sustainability of project results and processes in the three countries is likely to depend more on national commitment and initiative than continued GEF assistance.

3.B Lessons Learned ³⁰

Implementation Approach and Coordination Arrangements:

153. *The approaches applied in building the project institutional framework and promoting public-private partnership encouraged high ownership and commitment levels.* Institutional arrangements were built around existing networks and collaborative processes, as was the case with the national research institutions that implemented the coastal monitoring programme, and the producer associations and extension agencies that were associated to cooperatives and private groups of growers. As a result, many of the demonstration, training and monitoring activities were compatible with (and supportive of) institutional mandates and goals. This has been critical to the project's insertion at the country level and to ensuring coherence with ongoing processes. The commitment and sense of ownership displayed by national partner institutions was reflected in their performance, and in the significant co-financing contributions that were leveraged.

154. *The design of project implementation strategies needs to consider cultural and socioeconomic variables, in order to ensure relevance and coherence to different national and sub-national contexts.* The project effectively promoted good agricultural practices and IPM for a diverse range of crops – banana, plantain, pineapple, beans, rice, African Palm – and target groups that included export-oriented cooperatives, established production and marketing enterprises, and indigenous small-scale farmers dedicated to food production for local consumption. Although the diversity of demonstration sites and operating environments influenced asymmetrical implementation processes between countries, it enabled the project to validate practices suited to different socioeconomic and environmental contexts and scales of production – from natural insecticides and leguminous cover crops to polyethylene sheets that extend over hundreds of hectares of pineapple plantations. The validation of IPM practices that are adaptable to different crops, farming systems and scales of production strengthened the project's demonstration value and replication potential.

155. *Stakeholder participation and consultation processes are cumbersome yet pay off in terms of project quality and relevance.* As noted in the final project report, the coordination of implementation activities with national committees that included broad stakeholder representation requires more time than interventions that work directly with implementing agencies. However, the systematic consultations that were applied by the project at the national level enhanced the quality of the demonstration projects and their coherence with national needs and priorities. Ownership was improved when demonstration projects and other interventions were designed by implementing partner institutions with minimal external consultancy support. In such cases, formulation processes were time-consuming yet strengthened institutional capacity and ownership, improving the likelihood of sustainability beyond the project term.

156. *The project approach was compatible with (and built on) the integrated watershed and coastal management practices that were developed and validated through the IW-CAM programme that is supported by UNEP.* Both initiatives shared common elements including a basin-wide focus and recognition of the ecosystemic relations between land and marine environments (the “white water/blue water” linkages); project sites combined rivers, coastal lagoons and marine locations. Both initiatives have used agricultural production as an “entry point” for raising public awareness on the environmental dimension of the issues addressed.

³⁰ This section builds on the extensive and insightful lessons that were identified during the mid-term evaluation and regional project meetings, and which are documented in the Final Project Report and Mid-term Evaluation Report. The lessons contained in the Final Project Report are listed in Annex 6.

And in both cases, *success* was driven by institutional coordination and participation mechanisms that articulated participants at different levels, opened channels for communication and feedback, and encouraged national/local ownership. The new project proposal that was submitted to GEF for review ³¹ builds on the project's results and applies IW-CAM concepts, by supporting alternative land/crop/soil management practices and comprehensive resource management plans (among other measures) to mitigate the environmental threats resulting from the inappropriate use of agrochemicals by the agricultural and tourism sectors.

GAPs and Demonstration Projects:

157. *GAP adoption is more likely where acceptability is market-driven.* In this respect, the implementation approach was innovative and a key determinant of project success. Environment and economics were connected and led to synergies that were reflected in the results achieved. This connection has encouraged the adoption of GAPs by banana and pineapple growers that are linked to export markets; as well as the continuity of good practices and their dissemination by national partner institutions.

158. Export-oriented producers that conform to international quality requirements were more likely to adopt good practices than subsistence producers in economically depressed areas where socioeconomic expectations are lower. In Colombia and Costa Rica, the project's efforts to promote integrated pest management and lower pesticide use were reinforced by Global Gap certification requirements that improve access to export markets and provide tangible economic benefits, as well as by cost savings associated with reduced pesticide use.

159. *The promotion of GAPs was more effective and efficient when managed by established enterprises that were directly engaged in crop production and marketing. Conversely, this process was less efficient and more time-consuming when organizational support structures were absent.* Institutional partners were well chosen. This was reflected in the effective partnerships that were developed with established national enterprises that offered implementation capacity and were positioned to influence a broad range of producers and crop extension. This has been an important driver of sustainability as well, and several institutional partners have extended the use of GAPs and apply training activities with internal resources.

Revision of policy, legal and regulatory frameworks:

160. *Systemic changes were difficult to catalyze within the available timeframe and budgetary resources.* Compressing demonstration, capacity building, monitoring, institutionalization and the revision of legal/regulatory frameworks in three countries into a four-year project was not feasible. Indeed, having impact on national policies or laws – even indirectly - was unlikely given the project timeframe and resources. Assistance was given to the drafting of national crop certification proposals that supported policy advocacy yet had little impact due to the complexities of national certification schemes that require longer-term support and must address several issues³² to become viable. National norms for crop certification have to be aligned with the international standards that are already applied to export producers. This is difficult to achieve in the short-term, beyond the challenges of

³¹ Improved management of agrochemical life cycles in the Caribbean and Central American region.

³² These include institutional capacities and financing for GAP training, monitoring and certification; consumer education; consideration of incentives; and how to engage dispersed small-scale production that supply an important segment of the domestic market.

applying export norms to small-scale agricultural production that is destined for domestic markets. Likewise, national consumers need to be informed on the advantages of purchasing certified products (at higher prices) that apply IPM and other good practices.

161. *Policy and legal/regulatory reform processes are not linear and alternative project arrangements are required to generate impact.* The project document's logical framework recognized the "critical assumption" implicit to reforming these frameworks, which require executive/legislative actions and are influenced by variables outside the project's control. Policy and legal reform involve medium-term processes that are often complex and discontinuous; hence results or outcomes cannot be reliably programmed within conventional project periods. They require broader (and more flexible) time and funding parameters in order to inform decision-makers, support advocacy, build momentum and track progress. In this respect, projects are likely to have greater impact through incremental "exit strategies" that program a gradual withdrawal of project support over a longer period of time, with the possibility of providing intermittent backstopping support to move these processes forward.

Monitoring:

162. *Effective coastal pesticide monitoring was determined by existing high capacity levels among national research institutions.* The project has played an important role in strengthening the range of pesticide analysis services provided by participating research institutions through the acquisition of equipment, training and exchanges. This has contributed to the approval of ISO17025 accreditation for the participating laboratories. Likewise, the project provided catalytic support in brokering institutional partnerships, monitoring protocols and financial resources that enabled the implementation of the Coastal Monitoring Programme during the project period. Project support was catalytic and built on prior capacity building and regional cooperation initiatives such as those supported by IAEA. These institutions already constituted centers of excellence in their respective countries. As noted in the Final Project Report, excellence in laboratory management and the implementation of quality control programmes are essential to ensure the credibility of results and facilitate their acceptance by the private sector.

163. *Continued cooperation between national research institutions on pesticide monitoring is feasible yet needs to consider the political dimension and budgetary realities.* There are opportunities for continued cooperation between research institutions that are reinforced by past collaborations, common mandates and interests, and the rapport between scientific staff from the three countries. The Coastal Monitoring Programme provides the enabling conditions for this to happen, through the approved Monitoring Protocol and the harmonization of analysis methods that provide consistent and comparable data. Most important, there is an institutional pre-disposition towards regional cooperation, as reflected in CICA's hosting of regional training events and the suggestion that the contracting of future marine monitoring on Costa Rica's Caribbean coastline to INVEMAR might offer a more cost-effective option in terms of capacity and equipment.

164. However, this needs to be reflected in policy priorities and budgets. According to interviewed staff, one of the main challenges faced by the monitoring component was bridging the gap between the scientific and political dimensions of pesticide monitoring. The detection of low baseline pesticide levels that do not pose an environmental threat may have weakened the policy and budgetary commitment required for further coastal monitoring at the scale of the MCB (there have not been monitoring campaigns involving the three countries since the project's termination). Likewise, there are political considerations that restrict the publication of monitoring findings for politically sensitive areas. As noted in the final project report, it is important to balance discretion in managing monitoring information with the dissemination of key results to project stakeholders.

Sustainability:

165. *Sustainability depends fundamentally on the commitment and actions of MCB governments and national partners, and should be conditioned to continued GEF support.* This is happening in several cases. The project ended one year ago and the possibility of follow-up GEF support is uncertain. The initiative is up to the countries to give momentum to activities that developed from the project, and take advantage of present opportunities that still exist to move sound pesticide management, GAPs and national certification forward – both in the field and at policy and legislative levels. Several “entry points” were identified that can serve as vehicles to extend GAPs, training and monitoring – and influence recent legislation; in several cases there seems to be progress in this direction .

3.C Recommendations

166. *Continue with institutionalization and policy advocacy efforts.* There were encouraging advances in the institutionalization of project results and processes that need to be consolidated in order to generate the enabling conditions for disseminating GAPs on a wider scale and monitoring of pesticide residues, applying the methodology and sites established by the Coastal Monitoring Programme and related monitoring protocol.

167. It is essential that national partner institutions continue to support priority initiatives that sustain and expand on project achievement: In *Colombia*, AUGURA should continue to provide technical support to banana and plantain cooperatives in the Magdalena and Urabá regions for the application of GAPs by larger numbers of growers. The Agrarian Society of Colombia (SAC) should maintain the offer of insurance discounts to banana growers applying GAPs. The reclamation of ICA good practices within legal resolution 4174 needs to be completed (by ICA). GAPs should be replicated and extended to a wider range of crops and locations, as is envisioned in the Boyacá region and coffee-growing areas with CI and KfW support. INVEMA R should be supported in the expansion of pesticide monitoring to the Pacific coast. In *Costa Rica*, MINAET should build on national crop certification proposals that were designed with the project; this will further involvement of key partner institutions (i.e. Ministry of Agriculture, the national fito-sanitary service, agrochemical sector representatives) that served on the NCC. Likewise, the commendable initiative of CORBANA, BANACOL and PROAGRIN in disseminating and expanding the application GAPs is essential to the institutionalization of such practices; PROAGRIN can build on this by including GAPs as a credit requirement for pineapple growers, under the credit programme it expects to implement in 2013. In *Nicaragua*, MARENA should further develop the pre-feasibility proposal for national crop certification, in coordination with MAGFOR and other ex-NCC members. Ongoing efforts to adopt legal norms for the transport, handling, storage and disposal of pesticides should also move forward through their evaluation and approval by the National Commission on Norms. On the Atlantic Coast, BICU is positioned to continue disseminating GAPs under a new project on climate change adaptation (funded by the EU) that will be implemented in Kukra Hill with the municipal government; other possibilities of external support should be explored for this purpose. Training manuals for GAPs need to be updated on the basis of demonstration results and spread to a wider audience under the core activities of ICIDRI. Pesticide monitoring activities should continue to the extent feasible, both through external support for CIRA/UNAN and thesis research by BICU students; this process should be driven by MARENA.

168. *Refine and approve proposed national certification programmes based on GAPs.* There are advocacy efforts in the three countries that require medium-term support in order to improve the technical and political viability of national crop certification. The project supported the design of national certification proposals for Nicaragua and Costa Rica; and there are ongoing activities in Colombia. However, these proposals need to be developed further and disseminated to a wider audience by the ministries of environment and agriculture

in the three countries, with the support of national agricultural associations such as ICA in Colombia and agrochemical sector representatives such as ANIFODA in Nicaragua. Issues need to be clarified concerning institutional mandates; budgetary needs and funding sources; crops to be covered; market incentives for producers; consumer education; and reaching dispersed small-scale producers that supply the domestic market. This may well require action by the legislative branches of government of each country, as well as lobbying efforts by ministries and producer associations. It is also important that consistent standards be applied, so that national certification standards are compatible with those presently required by GlobalGap for export producers.

169. *Future pesticide management initiatives should be inclusive of other crops that are pesticide intensive.* During the evaluation visits, respondents identified other crops that contribute to pesticide runoff and contamination levels, and perhaps more so than those targeted by the project. Cutflowers, rice and intensive vegetable cultivation take place in the three MCB countries and reportedly utilize considerable amounts of pesticide. These crops should be incorporated within a broader regional strategy (such as that envisioned by the follow-up GEF proposal), GAPs and IPM methods adapted, and selected pesticides monitored by applying the guidelines that were developed for the Coastal Monitoring Programme. This will require linking follow-up actions by the implementing ministries of environment and agriculture, in close coordination with producer associations, training institutes and research laboratories. Likewise, the impact of mining on coastal contamination is significant in Nicaragua and Colombia and merits consideration under future project initiatives.

170. *Establish national norms and parameters regulating pesticide residue levels in soil and water.* This was not feasible during the project cycle due to time and resource limitations. Rational pesticide management requires national legislation to regulate parameters and concentrations of pesticide residues in soil and water, and lower associated risks to the environment and human health. This is a complex issue as existing norms that are applied by European or North American countries need to be adjusted to the environmental conditions and crops that prevail in the MCB. Although the three countries regulate the importation of pesticides, there is also need to ensure rational transport, storage, application and disposal practices. This is a broad issue that needs to be developed by the ministries of environment and agriculture, in consultation with agrochemical enterprises and producer associations, and reflected in national legislation; *Nicaragua* is advancing in this direction and may be in a position to offer guidance to other countries.

171. *Give continuity to coastal pesticide monitoring.* It is important that the low baseline pesticide levels that were documented do not lower government commitment or resource availability for future monitoring campaigns. Pesticide monitoring should be continued by national research institutions, focusing attention on sites and compounds of concern. These institutions have strengthened their laboratory analysis capabilities through improved technology and training, but require external funding for further monitoring in the case of Nicaragua and Costa Rica (as well as modified institutional norms for Costa Rica's National Fitosanitary Service and Water Directorate). Further work is required on the diagnosis of sources – including other crops as suggested above - and control strategies; this will require additional research by the laboratories and analysis of options by the Ministries of Environment in consultation with other institutions that were active in the national committees (such as the above-mentioned National Fitosanitary Service). The GIS platform developed by the project provides a vehicle for managing and publishing complementary monitoring activities that can be expanded beyond pesticides. There are excellent opportunities for continued collaboration and twinning between research laboratories.

172. *The project approach to pesticide monitoring and IPM should evolve into a wider area-based strategy based on IW-CAM principles.* The project's didactic value was largely based on its ability to raise awareness on the environmental consequences of irrational pesticide

management and disposal. This carried a multiplier effect by linking on-site practices to the wider ecological and developmental context. The project's consistency with IW-CAM principles is noted in the report, and future efforts to mitigate or prevent pesticide contamination should tend towards the integrated sustainable development dynamics that IW-CAM promotes.

173. In the event that the proposed new GEF project is approved, there should be an inception phase to ensure adequate preparation and focus project components on specific country needs. The mechanisms to maintain momentum between the project development phase and initiation need to be in place. A "one size fits all" approach clearly will not work given the environmental, social and economic diversity of the expanded project area. During the country visits, respondents expressed concern regarding the selection of crops and economic sectors, the likelihood of slow start-up and administrative processes, and the risk of fragmenting the budget among too many countries or demonstration sites. An early consensus on implementation guidelines between GEF, UNEP and national partners - in addition to realistic timelines that can be adjusted to support lagging components or countries - will be important to ensure effective performance and impact.

ANNEXES

Annex 1

I. TERMS OF REFERENCE FOR THE EVALUATION

A. Objective and Scope of the Evaluation

1. In line with the UNEP Evaluation Policy¹, the UNEP Evaluation Manual¹ and the Guidelines for GEF Agencies in Conducting Terminal Evaluations¹, the terminal evaluation of the Project “Reducing Pesticide Runoff to the Caribbean Sea”- GEF 1248 is undertaken at the end of the project to assess project performance (in terms of relevance, effectiveness and efficiency), and determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability. The evaluation has two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP, interested governments, the GEF and their partners. Therefore, the evaluation will identify lessons of operational relevance for future project formulation and implementation. It will focus on the following sets of **key questions**, based on the project’s intended outcomes, which may be expanded by the consultants as deemed appropriate:

- (a) How successful was the project in establishing effective regional cooperation and consolidated regional and national networks among project countries for the assessment and management of environmental pollution?
- (b) To what extent did the project validate a set of environmentally sound, socially acceptable and economically feasible good agricultural practices (GAP) for some of the major crops of the MCB?
- (c) Did the project made progress towards streamlining laws and regulations for pesticide management?
- (d) How successful was the project in increasing knowledge of the interactions between agriculture and environment and improving public awareness on the importance of agricultural sources of marine pollution?

B. Overall Approach and Methods

2. The terminal evaluation of the Project “Reducing Pesticide Runoff to the Caribbean Sea”- GEF 1248 will be conducted by one independent consultants under the overall responsibility and management of the UNEP Evaluation Office (Nairobi), in consultation with the UNEP GEF Coordination Office (Nairobi).

3. It will be an in-depth evaluation using a participatory approach whereby key stakeholders are kept informed and consulted throughout the evaluation process. Both quantitative and qualitative evaluation methods will be used to determine project achievements against the expected outputs, outcomes and impacts.

4. The findings of the evaluation will be based on the following:

- (a) A **desk review** of project documents¹ including, but not limited to:
 - Relevant background documentation, inter alia UNEP and GEF policies, strategies and programmes pertaining to biodiversity conservation;
 - Project design documents; Annual Work Plans and Budgets or equivalent, revisions to the logical framework and project financing;

- Project reports such as progress and financial reports from countries to the EA and from the EA to UNEP; Steering Committee meeting minutes; annual Project Implementation Reviews and relevant correspondence;
 - The Mid-term Review report;
 - Documentation related to project outputs, if any;
 - Terminal project report if available
- (b) **Interviews¹** with:
- Project management and execution support, at national and regional levels (UNEP-CAR/RCU);
 - UNEP Task Manager and Fund Management Officer (Nairobi);
 - Country lead execution partners and other relevant stakeholders in particular political leaders targeted for awareness raising, protected areas managers targeted for capacity building, and local communities and business targeted for awareness raising and capacity building;
 - Relevant staff of GEF Secretariat;
 - Representatives of other multilateral agencies and other relevant organisations providing co-financing.
- (c) **Country visits.** The consultant will visit Colombia, Costa Rica and Nicaragua to meet with project staff and visit demonstration projects. (S)he will also travel to Jamaica to meet with the project executing agency and relevant staff.

C. Key Evaluation principles

5. Evaluation findings and judgements should be based on **sound evidence and analysis**, clearly documented in the evaluation report. Information will be triangulated (i.e. verified from different sources) to the extent possible, and when verification was not possible, the single source will be mentioned¹. Analysis leading to evaluative judgements should always be clearly spelled out.

6. The evaluation will assess the project with respect to **a minimum set of evaluation criteria** grouped in four categories: (1) Attainment of objectives and planned results, which comprises the assessment of outputs achieved, relevance, effectiveness and efficiency and the review of outcomes towards impacts; (2) Sustainability and catalytic role, which focuses on financial, socio-political, institutional and ecological factors conditioning sustainability of project outcomes, and also assesses efforts and achievements in terms of replication and up-scaling of project lessons and good practices; (3) Processes affecting attainment of project results, which covers project preparation and readiness, implementation approach and management, stakeholder participation and public awareness, country ownership/driven-ness, project finance, UNEP supervision and backstopping, and project monitoring and evaluation systems; and (4) Complementarity with the UNEP strategies and programmes. The lead consultant can propose other evaluation criteria as deemed appropriate.

7. **Ratings.** All evaluation criteria will be rated on a six-point scale. However, complementarity of the project with the UNEP strategies and programmes is not rated. Annex 3 provides detailed guidance on how the different criteria should be rated and how ratings should be aggregated for the different evaluation criterion categories.

8. In attempting to attribute any outcomes and impacts to the project, the evaluators should consider the difference between **what has happened with** and **what would have happened without** the project. This implies that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. This also means that there should be plausible evidence to attribute such outcomes and impacts to the

actions of the project. Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluators, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

9. As this is a terminal evaluation, particular attention should be given to learning from the experience. Therefore, **the “why?” question** should be at front of the consultants’ minds all through the evaluation exercise. This means that the consultants needs to go beyond the assessment of “what” the project performance was, and make a serious effort to provide a deeper understanding of “why” the performance was as it was, i.e. of processes affecting attainment of project results (criteria under category 3). This should provide the basis for the lessons that can be drawn from the project. In fact, the usefulness of the evaluation will be determined to a large extent by the capacity of the consultants to explain “why things happened” as they happened and are likely to evolve in this or that direction, which goes well beyond the mere assessment of “where things stand” today.

D. Evaluation criteria

1. Attainment of Objectives and Planned Results

10. The evaluation should assess the relevance of the project’s objectives and the extent to which these were effectively and efficiently achieved or are expected to be achieved.

- (a) *Achievement of Outputs and Activities:* Assess, for each component, the project’s success in producing the programmed outputs as presented in Table A1.1 (Annex 1), both in quantity and quality, as well as their usefulness and timeliness. Briefly explain the degree of success of the project in achieving its different outputs, cross-referencing as needed to more detailed explanations provided under Section 3 (which covers the processes affecting attainment of project objectives). The achievements under the national demonstration projects will receive particular attention.
- (b) *Relevance:* Assess, in retrospect, whether the project’s objectives and implementation strategies were consistent with: i) Sub-regional environmental issues and needs; ii) the UNEP mandate and policies at the time of design and implementation; and iii) the relevant GEF focal areas, strategic priorities and operational programme(s).
- (c) *Effectiveness:* Assess to what extent the project has achieved its main objectives **to reduce pesticide runoff to the Caribbean Sea through the implementation of good agricultural practices and specific measures to improve the management of pesticides in the agricultural sector in the participating countries** and its component objectives as presented in Table 2 above. To measure achievement, use as much as appropriate the indicators for achievement proposed in the Logical Framework Matrix (Logframe) of the project, adding other relevant indicators as appropriate. Briefly explain what factors affected the project’s success in achieving its objectives, cross-referencing as needed to more detailed explanations provided under Section 3.
- (d) *Efficiency:* Assess the cost-effectiveness and timeliness of project execution. Describe any cost- or time-saving measures put in place in attempting to bring the project to a successful conclusion within its programmed budget and (extended) time. Analyse how delays, if any, have affected project execution, costs and effectiveness. Wherever possible, compare the cost and time over results ratios of the project with that of other similar projects. Give special

attention to efforts by the project teams to make use of / build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. to increase project efficiency.

- (e) *Review of Outcomes to Impacts (ROI)*: Reconstruct the logical pathways from project outputs over achieved objectives towards impacts, taking into account performance and impact drivers, assumptions and the roles and capacities of key actors and stakeholders, using the methodology presented in the GEF Evaluation Office's ROI Practitioner's Handbook¹ (summarized in Annex 8 of the TORs). Assess to what extent the project has to date contributed, and is likely in the future to further contribute to changes in stakeholder behaviour as regards: i) improved regional cooperation and networking for prevention and management of environmental pollution, ii) improved acceptance of GAP, iii) improved public awareness on the importance of agricultural sources of marine pollution and the likelihood of those leading to changes in the natural resource base and benefits derived from the environment: a) reduced environmental impact from pesticides used for targeted crops and its runoff in the Caribbean.

2. Sustainability and catalytic role

11. **Sustainability** is understood as the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The evaluation will identify and assess the key conditions or factors that are likely to undermine or contribute to the persistence of benefits. Some of these factors might be direct results of the project while others will include contextual circumstances or developments that are not under control of the project but that may condition sustainability of benefits. The evaluation should ascertain to what extent follow-up work has been initiated and how project results will be sustained and enhanced over time. Application of the ROI method will assist in the evaluation of sustainability.

12. Four aspects of sustainability will be addressed:

- (a) *Socio-political sustainability*. Are there any social or political factors that may influence positively or negatively the sustenance of project results and progress towards impacts? Is the level of ownership by the main national and regional stakeholders sufficient to allow for the project results to be sustained? Are there sufficient government and stakeholder awareness, interests, commitment and incentives to execute, enforce and pursue the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project?
- (b) *Financial resources*. To what extent are the continuation of project results and the eventual impact of the project dependent on continued financial support? What is the likelihood that adequate financial resources¹ will be or will become available to implement the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project? Are there any financial risks that may jeopardize sustenance of project results and onward progress towards impact?
- (c) *Institutional framework*. To what extent is the sustenance of the results and onward progress towards impact dependent on issues relating to institutional frameworks and governance? How robust are the institutional achievements such as governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. required to sustaining project results and to lead those to impact on human behaviour and environmental resources?

- (d) *Environmental sustainability*. Are there any environmental factors, positive or negative, that can influence the future flow of project benefits? Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits?

13. **Catalytic Role and Replication.** The *catalytic role* of GEF-funded interventions is embodied in their approach of supporting the creation of an enabling environment and of investing in pilot activities which are innovative and showing how new approaches can work. UNEP and the GEF also aim to support activities that upscale new approaches to a national, regional or global level, with a view to achieve sustainable global environmental benefits. The evaluation will assess the catalytic role played by this project, namely to what extent the project has:

- (a) *catalyzed behavioural changes* in terms of use and application by the relevant stakeholders of: i) technologies and approaches show-cased by the demonstration projects; ii) strategic programmes and plans developed; and iii) assessment, monitoring and management systems established at a national and sub-regional level;
- (b) provided *incentives* (social, economic, market based, competencies etc.) to contribute to catalyzing changes in stakeholder behaviour;
- (c) contributed to *institutional changes*. An important aspect of the catalytic role of the project is its contribution to institutional uptake or mainstreaming of project-piloted approaches in the regional and national demonstration projects;
- (d) contributed to *policy changes* (on paper and in implementation of policy);
- (e) contributed to sustained follow-on financing (*catalytic financing*) from Governments, the GEF or other donors;
- (f) created opportunities for particular individuals or institutions (“*champions*”) to catalyze change (without which the project would not have achieved all of its results).

14. *Replication*, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated (experiences are repeated and lessons applied in different geographic areas) or scaled up (experiences are repeated and lessons applied in the same geographic area but on a much larger scale and funded by other sources). The evaluation will assess the approach adopted by the project to promote replication effects and evaluate to what extent actual replication has already occurred or is likely to occur in the near future. What are the factors that may influence replication and scaling up of project experiences and lessons?

3. Processes affecting attainment of project results

15. **Preparation and Readiness.** Were the project’s objectives and components clear, practicable and feasible within its timeframe? Were the capacities of executing agencies properly considered when the project was designed? Was the project document clear and realistic to enable effective and efficient implementation? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project implementation? Were counterpart resources (funding, staff, and facilities) and enabling legislation assured? Were adequate project management arrangements in place? Were lessons from other relevant projects properly incorporated in the project design? Were lessons learned and recommendations from Steering Committee meetings adequately integrated in the project

approach? What factors influenced the quality-at-entry of the project design, choice of partners, allocation of financial resources etc.?

16. Implementation Approach and Adaptive Management. This includes an analysis of approaches used by the project, its management framework, the project's adaptation to changing conditions (adaptive management), the performance of the implementation arrangements and partnerships, relevance of changes in project design, and overall performance of project management. The evaluation will:

- (a) Ascertain to what extent the project implementation mechanisms outlined in the project document have been followed and were effective in delivering project outputs and outcomes. Were pertinent adaptations made to the approaches originally proposed?
- (b) Assess the role and performance of the units and committees established and the project execution arrangements at all levels;
- (c) Evaluate the effectiveness and efficiency of project management by the EA and how well the management was able to adapt to changes during the life of the project;
- (d) Assess the extent to which project management responded to direction and guidance provided by the Steering Committee and IA supervision recommendations;
- (e) Identify administrative, operational and/or technical problems and constraints that influenced the effective implementation of the project, and how the project partners tried to overcome these problems;
- (f) Assess the extent to which MTE recommendations were followed in a timely manner.

17. Stakeholder¹ Participation and Public Awareness. The term stakeholder should be considered in the broadest sense, encompassing project partners, government institutions, private interest groups, local communities etc. The assessment will look at three related and often overlapping processes: (1) information dissemination between stakeholders, (2) consultation between stakeholders, and (3) active engagement of stakeholders in project decision making and activities. The evaluation will specifically assess:

- (a) the approach(es) used to identify and engage stakeholders in project design and implementation. What were the strengths and weaknesses of these approaches with respect to the project's objectives and the stakeholders' motivations and capacities? What was the achieved degree and effectiveness of collaboration and interactions between the various project partners and stakeholders during the course of implementation of the project?
- (b) the degree and effectiveness of any public awareness activities that were undertaken during the course of implementation of the project; or that are built into the assessment methods so that public awareness can be raised at the time the assessments will be conducted;
- (c) how the results of the project (strategic programmes and plans, monitoring and management systems, sub-regional agreements etc.) engaged key stakeholders in international waters and reduction/elimination of production, use and release of POPs.

18. The ROTI analysis should assist the consultants in identifying the key stakeholders and their respective roles, capabilities and motivations in each step of the causal pathway from activities to achievement of outputs and objectives to impact.

19. **Country Ownership and Driven-ness.** The evaluation will assess the performance of the Governments of the countries involved in the project, namely:

- (a) in how the Governments have assumed responsibility for the project and provided adequate support to project execution, including the degree of cooperation received from the various contact institutions in the countries involved in the project and the timeliness of provision of counter-part funding to project activities;
- (b) to what extent the political and institutional framework of the participating countries has been conducive to project performance. Look, in particular, at the extent of the political commitment to enforce (sub-) regional agreements promoted under the project;
- (c) to what extent the Governments have promoted the participation of communities and their non-governmental organisations in the project; and
- (d) how responsive the Governments were to UNEP coordination and guidance, to UNEP supervision and Mid-Term Review recommendations.

20. **Financial Planning and Management.** Evaluation of financial planning requires assessment of the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. The assessment will look at actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and co-financing. The evaluation will:

- (a) Verify the application of proper standards (clarity, transparency, audit etc.) and timeliness of financial planning, management and reporting to ensure that sufficient and timely financial resources were available to the project and its partners;
- (b) Assess other administrative processes such as recruitment of staff, procurement of goods and services (including consultants), preparation and negotiation of cooperation agreements etc. to the extent that these might have influenced project performance;
- (c) Present to what extent co-financing has materialized as expected at project approval (see Table 1). Report country co-financing to the project overall, and to support project activities at the national level in particular. The evaluation will provide a breakdown of final actual costs and co-financing for the different project components (see tables in Annex 4).
- (d) Describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project's ultimate objective. Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO's, foundations, governments, communities or the private sector.

21. Analyse the effects on project performance of any irregularities in procurement, use of financial resources and human resource management, and the measures taken by the EA or IA to prevent such irregularities in the future. Assess whether the measures taken were adequate.

22. **UNEP Supervision and Backstopping.** The purpose of supervision is to verify the quality and timeliness of project execution in terms of finances, administration and achievement of outputs and outcomes, in order to identify and recommend ways to deal with problems which arise during project execution. Such problems may be related to project management but may also involve technical/institutional substantive issues in which UNEP has a major contribution to make. The evaluators should assess the effectiveness of supervision and administrative and financial support provided by UNEP including:

- (a) The adequacy of project supervision plans, inputs and processes;
- (b) The emphasis given to outcome monitoring (results-based project management);
- (c) The realism and candour of project reporting and ratings (i.e. are PIR ratings an accurate reflection of the project realities and risks);
- (d) The quality of documentation of project supervision activities; and
- (e) Financial, administrative and other fiduciary aspects of project implementation supervision.

23. **Monitoring and Evaluation.** The evaluation will include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on the assumptions and risks identified in the project document. The evaluation will assess how information generated by the M&E system during project implementation was used to adapt and improve project execution, achievement of outcomes and ensuring sustainability. M&E is assessed on three levels:

- (a) *M&E Design.* Projects should have sound M&E plans to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART indicators and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified. The evaluators should use the following questions to help assess the M&E design aspects:
 - Quality of the project logframe as a planning and monitoring instrument; analyse/compare logframe in Project Document, revised logframe (2008) and logframe used in Project Implementation Review reports to report progress towards achieving project objectives;
 - SMART-ness of indicators: Are there specific indicators in the logframe for each of the project objectives? Are the indicators measurable, attainable (realistic) and relevant to the objectives? Are the indicators time-bound?
 - Adequacy of baseline information: To what extent has baseline information on performance indicators been collected and presented in a clear manner? Was the methodology for the baseline data collection explicit and reliable?
 - Arrangements for monitoring: Have the responsibilities for M&E activities been clearly defined? Were the data sources and data collection instruments appropriate? Was the frequency of various monitoring activities specified and adequate? In how far were project users involved in monitoring?

- Arrangements for evaluation: Have specific targets been specified for project outputs? Has the desired level of achievement been specified for all indicators of objectives and outcomes? Were there adequate provisions in the legal instruments binding project partners to fully collaborate in evaluations?
 - Budgeting and funding for M&E activities: Determine whether support for M&E was budgeted adequately and was funded in a timely fashion during implementation.
- (b) *M&E Plan Implementation.* The evaluation will verify that:
- the M&E system was operational and facilitated timely tracking of results and progress towards projects objectives throughout the project implementation period;
 - annual project reports and Progress Implementation Review (PIR) reports were complete, accurate and with well justified ratings;
 - the information provided by the M&E system was used during the project to improve project performance and to adapt to changing needs;
 - projects had an M&E system in place with proper training, instruments and resources for parties responsible for M&E.

4. Complementarities with UNEP strategies and programmes

24. UNEP aims to undertake GEF funded projects that are aligned with its own strategies. The evaluation should present a brief narrative on the following issues:

- (a) *Linkage to UNEP's Expected Accomplishments and POW 2012-2013.* The UNEP MTS specifies desired results in six thematic focal areas. The desired results are termed Expected Accomplishments. Using the completed ROI analysis, the evaluation should comment on whether the project makes a tangible contribution to any of the Expected Accomplishments specified in the UNEP MTS. The magnitude and extent of any contributions and the causal linkages should be fully described. Whilst it is recognised that UNEP GEF projects designed prior to the production of the UNEP Medium Term Strategy (MTS)¹/ Programme of Work (POW) 2012/13 would not necessarily be aligned with the Expected Accomplishments articulated in those documents, complementarities may still exist.
- (b) *Alignment with the Bali Strategic Plan (BSP)¹.* The outcomes and achievements of the project should be briefly discussed in relation to the objectives of the UNEP BSP.
- (c) *Gender.* Ascertain to what extent project design, implementation and monitoring have taken into consideration: (i) possible gender inequalities in access to and the control over natural resources; (ii) specific vulnerabilities of women and children to environmental degradation or disasters; and (iii) the role of women in mitigating or adapting to environmental changes and engaging in environmental protection and rehabilitation. Assess whether the intervention is likely to have any lasting differential impacts on gender equality and the relationship between women and the environment. To what extent do unresolved gender inequalities affect sustainability of project benefits?

- (d) *South-South Cooperation*. This is regarded as the exchange of resources, technology, and knowledge between developing countries. Briefly describe any aspects of the project that could be considered as examples of South-South Cooperation.

E. The Consultants' Team

25. For this evaluation, one independent consultant will be hired, from the project sub-region. The consultant will have at least 10-year each of expertise and experience in:

- (a) Evaluation of environmental projects;
- (b) Pesticides and environmental management;
- (c) Fluency in oral and written English and Spanish.

In addition, the consultant will have an education background in Environment and Natural Resources.

26. The consultant will be responsible for coordinating the data collection and analysis phase of the evaluation, and preparing the main report. (S)He will ensure that all evaluation criteria are adequately covered by the team.

27. *By undersigning the service contract with UNEP/UNON, the consultants certify that they have not been associated with the design and implementation of the project in any way which may jeopardize their independence and impartiality towards project achievements and project partner performance. In addition, they will not have any future interests (within six months after completion of their contract) with the project's executing or implementing units.*

F. Evaluation Deliverables and Review Procedures

28. The Consultant will prepare and submit an **inception report** to the UNEP Evaluation Office before starting fieldwork or desk based phone/email interviews. See Annex 11 for annotated Table of Contents of Inception Report.

29. The inception report lays the foundations for the main evaluation. Its purpose is to develop an evaluation framework that includes:

- A review of the quality of project design to help identify how project design impacts on project implementation and performance;
- An analysis of the project's theory of change, creating a baseline which can be used to assess the actual project outcomes and impacts (expected and unexpected) during field visits and interviews;
- A detailed plan for the evaluation process.

The main components of the inception report are:

30. Review of the Quality of Project Design: The review of project design is done on the basis of the project document and log frame. The Team Leader should also familiarize her/himself with the history and wider context of the project (details available on UNEP and GEF website, documentation from past projects etc). The analysis should be used to complete the 'Template for assessment of the quality of project design' (in the Annex 9 of the

TORs). The rating system follows the Evaluation ratings used for the main evaluation (also described in the annex of the TORs).

31. Theory of Change Analysis: Annex 8 of the TORs on Introduction to Theory of Change/Impact pathways, the ROTI Method and the ROTI results score sheet describes in details the Theory of Change approach. The Theory of Change analysis should be captured in a Theory of Change diagram, found in the annex. The diagram can be shared with project stakeholders in the course of the evaluation, as tool to aid discussion. Please note that the ratings requested in the annex are not needed in the inception report's Theory of Change analysis. The team leader should complete the ratings after the field visits/interviews. The ToC diagram and ratings should be incorporated in final evaluation report.

32. Evaluation Process Plan: The evaluation process plan is based on a review of the project design, theory of change analysis and also of all the project documentation (listed in TORs). The evaluation plan should include: summary of evaluation questions/areas to be explored/questions raised through document review; description of evaluation methodologies to be used.;_list of data sources, indicators; list of individuals to be consulted; detailed distribution of roles and responsibilities among evaluation consultants (for larger evaluation teams); revised logistics (selection of sites to be visited)/dates of evaluation activities.

Annex 2

The Evaluation Framework

In line with UNEP Evaluation Policy, UNEP's Evaluation Manual and the Guidelines for GEF Agencies in Conducting Terminal Evaluations, the TE of the project "Reducing Pesticide Runoff to the Caribbean Sea" was programmed at the end of the project to assess project performance (in terms of relevance, effectiveness and efficiency) and to determine outcomes and impacts stemming from the project, including their sustainability. As stated in the ToRs, the TE has the primary purposes of: (i) Providing evidence of results to meet accountability requirements, and (ii) promoting learning, feedback, and knowledge sharing through results and lessons learned among UNEP, interested governments, the GEF and their partners.

The TE is focused on a set of key questions, based on the project's intended outcomes, which may be expanded by the Evaluator as deemed appropriate:

- How successful was the project in establishing effective regional cooperation and consolidated regional/national networks among project countries for the assessment and management of environmental pollution?
- To what extent did the project validate a set of environmentally sound, socially acceptable and economically feasible good agricultural practices (GAP) for some of the major crops of the MCB?
- Has the project made progress towards streamlining laws and regulations for pesticide management?
- How successful was the project in increasing knowledge of the interactions between agriculture and environment, and improving public awareness on the importance of agricultural sources of marine pollution?

In addressing these questions, the Evaluator will triangulate findings from (i) the review of project documentation and relevant literature, (ii) interviews with the project team, (iii) meetings with government partners and other national stakeholders (producer associations, environmental groups, NGOs), and (iii) the results of demonstration projects implemented in the three countries. In addition, the Evaluator will incorporate a forward-looking dimension to assess perspectives for post-project continuity, considering both the capacity of national/regional stakeholders to sustain and replicate sound pesticide management and runoff reduction beyond the project term, and the status of follow-up proposals for continued GEF assistance. In this context, the TE will consider the project's influence in shaping the subsequent UNEP GEF initiative "Supporting the Implementation of the Global Monitoring Plan of POPs in Latin American and Caribbean States" and linking implementation activities.

The inception phase and associated report offer an opportunity in the evaluation process to take stock of documented findings, develop initial hypotheses, and define the current and near-future status of the evaluation. As mentioned, the Evaluator is required to carry out a Theory of Change (ToC) exercise to review the quality of project design based on the available documentation, and prepare an evaluation process plan.

Annex 3

Evaluation Programme

Nicaragua

Día	Hora	Actividad	Participantes
Jueves 11	20:30 p.m.	San José - Managua	
Viernes 12	08:30 a.m.	Reunión con Coordinación Nacional. Reunión con Vice Ministro de MARENA	Roberto Araquítain, Viceministro MARENA María Gabriela Abarca, Coordinadora Nacional María Auxiliadora Rodríguez, Asistente Administrativa DGCA-MARENA
	10:30 a.m.	Reunión con Entidad Ejecutora de Monitoreo CIRA – UNAN	Katherine Vammen, Jorge Cuadra, Ma. Gabriela Abarca
	2:00 p.m.	Reunión con ANIFODA	Jhon Fong, Ma. Gabriela Abarca
Sábado 13	05:00 a.m.	Viaje a Bluefields	
	08:30 a.m.	Reunión con BICU	Gustavo Castro, Eduardo Siu, René Romero y Sr. Navajas
	10:00 am	Viaje a Kukra Hill	
	11:30 am	Reunión con Empresa de Palma Africana	David Miranda, Marvin Gutierrez,
	1:00 pm	Reunión con productor Sr. Asunción	René Romero y Sr. Navajas
	4:00pm	Regreso a Bluefields	René Romero y Sr. Navajas
	5:30 pm	Reunión BICU	Gustavo Castro, Eduardo Siu, René Romero
Domingo 14	6:30 am	Regreso a Managua	
Lunes 15	09:00 am	Reunión con ICIDRI UPOLI	Randall López, Isabel Lacayo, Ricardo Pastra, Ma. Gabriela Abarca
	11:00 am	Reunión con MAGFOR – DGPSA	Freddy Urroztalavera, Ma. Gabriela Abarca
Martes 16	8:30 am	Reunión con la DISUP – MARENA	DISUP-MARENA, DGCA y Sr. Navajas

Costa Rica

FECHA/HORA	LUGAR	ACTIVIDAD	ASISTENTES
Lunes 08/10. 8:00 am-11:30 am	Oficinas de DIGECA/MINAE	Reunión con algunos miembros del Comité Nacional de Coordinación	Ing. Marco Vinicio Jiménez, SFE/MAG Ing. Luis Matarrita, Fundación Limpiemos Nuestros Campos Ing. Roberto Obando, Cámara Insumos Agropecuarios Ing. Elídier Vargas, DIGECA/MINAE Dra. Pilar Alfaro, Unidad Ejecutora proyecto.
Lunes 08/10. 8:00 am-11:30 am	Laboratorio Centro Investigaciones en Contaminación Ambiental	Reunión con Director del CICA y técnicos que participaron en el proyecto Pernoctar en San José.	Director del CICA, Dra. Elizabeth Carazo, exdirec. CICA Sr. Jenaro Acuña - CIMAR
Martes 09/10. 6:00 am	Salida a San Carlos.	Visita a finca Pilo Produce e instalaciones de PROAGROIN – participantes en el proyecto (en Pital 9 am a 11:30 am)	Propietario de la empresa piñera Pilo Produce y técnico a Técnicos de PROAGROIN, participantes en el proyecto.
		Visita a finca de BANACOL en Venecia de San Carlos (13:00 horas) Pernoctar en Guápiles.	Técnicos de BANACOL, participantes en el proyecto (piña). Personal administrativo y gerencial de BANACOL
Miércoles 10/10. 7:00 am	Salida a San Pablo de Siquirres. Regreso a San José (13:00 horas). Pernoctar en San José.	Visita a Finca San Pablo, participante en el proyecto. Reunión con gerente de finca y técnicos de CORBANA involucrados en el proyecto.	Gerente de finca bananera San Pablo, técnicos de la finca Ing. Alejandro Rodríguez, técnico de CORBANA
Jueves 11/10 10.00am	Oficina CROPLIFE L.A. Viaje a Managua (13 horas)	Reunión final con Ing. Carlos Buzio, Presidente de CropLife Latin America.	Ing. Carlos Buzio con Ing. Elídier Vargas – coordinador REP

Colombia

Bogota

Alexandre Cooman, ex Regional Project Coordinator

Jairo Homez, ex National Project Coordinator and Advisor to Department of Environmental Affairs

María Fernanda Pulido, Department of Marine, Coastal and Aquatic Resource Affairs, Environment Ministry

Nelson Lucano, Environmental Management Group, Ministry of Agriculture & Rural Development

Luisa Espinoza, Coordinator of the Marine Environmental Quality Research Programme, INVEMAR

Jorge Bejarano, Vice-director Crop Department, AUGURA
Emerson Aguirre, Director AUGURA-Bogotá
Andrés Pinilla, Ministerio de Medio Ambiente

Santa Marta and Magdalena

Andrés Pinilla, Ministerio de Medio Ambiente
Jesus Garay, Scientific Vice-Director INVEMAR
Julián Betancourt, Head of Environmental Quality laboratory INVEMAR
Luisa Espinoza, Coordinator of the Marine Environmental Quality Research Programme, INVEMAR
Helena Bornacelli, AUGURA Demonstration Projects Coordinator
Edson Martinez, Manager COOPBAMAC Cooperative, Guacayamal
Nelson Gutierrez, Banana Grower COOPBAMAC Cooperative, Guayacamal
Edison Gonzales, Banana Grower EMBREBACOOOP, Orihuela

UNEP CAR/RCU

Nelson Andrade, Coordinator (by skype interview)
Donna Hernandez, Senior Programme Officer (by skype interview)

Annex 4

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- GF/2328-2761-4 *Reducing Pesticide Runoff to the Caribbean Sea* Project Document (2005)
- GFL 4880 Final Project Report, RepCar 2011
- Guide: Safe Use of Pesticides and Agricultural Inputs*, RepCar and AUGURA, 2009
- Improved management of agrochemical life cycles in the Caribbean and Central American region (PIF Proposal)*, RepCar, 2011
- Informe de la Cuarta Reunión – Taller de Planificación Programa de Monitoreo Costero*, RepCar 2010
- Informe de la Quinta Reunión del Comité Directivo del Proyecto del FMAM para la Reducción del Escurrimiento de Plaguicidas al Mar Caribe*, RepCar Colombia, 2011
- Reducing Pesticides Runoff to the Caribbean Sea: Mid-Term Project Evaluation*, Latin American Environmental Management, Inc (LAGA, 2007)_
- REPCar en Costa Rica - Experiencias exitosas para reducir el impacto de la agricultura sobre los ecosistemas costeros: Resumen de resultados y logros*, REPCar Costa Rica, 2011
- Residuos de Plaguicidas Agrícolas en Aguas Costeras del Caribe*, RepCar 2011
- Reunión – Taller de Planificación Proyectos Demostrativos en Buenas Prácticas Agrícolas BPA: Recomendaciones y Acuerdos*, RepCar Santa Marta, 2009
- Sistematización de Capacitaciones, Validaciones, Divulgación de Buenas Prácticas Agrícolas y Monitoreo del Escurrimiento de Plaguicidas al Mar Caribe Nicagüense*, RepCar Nicaragua, 2012
- UNEP GEF Project Implementation Review Reports, 2010-2011
- UNEP GEF Quarterly Reports, 2010-2011
- UNEP Project Document Revisions

Annex 5

Project costs and co-financing tables

Project Costs

Components/sub-components	Estimated cost at design	Actual Cost	Expenditure ratio (actual/planned)
Project Coordination			
Demonstration Projects	9,920,000	15,400,950	1.55/1
Institutionalizing Improved Pesticide Management			
<i>* note: several budget lines supported more than one component and cannot be disaggregated by individual component due to overlaps</i>			

Co financing (Type/Source)	IA own Financing (mill US\$)		Government (mill US\$)		Other* (mill US\$)		Total (mill US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
- Grants			1.770	0	0.100	0.105	1.870	0.105
- Loans								
- Credits								
- Equity investments								
- In-kind support	0	0.77	3.415	2.200	0.340	8.723,950	3.755	11.000,950
- Other (*)								
-								
-								
TOTALS	0	0.77	5.185	2.200	0.440	8.828,950	5.625	11.105,950

Annex 6

Review of Project Design

Criteria	Rating
Overall rating for Relevance	Highly Satisfactory: The project addresses recognized environmental risks that increasingly affect the MCB. There is broad alignment with UNEP, GEF and regional environmental priorities, and the needs of affected stakeholders.
Overall rating for Intended Results and Causality	Highly Satisfactory: The project's design captures the different levels of the problem being addressed. Project design is well conceived and applies an integrated, multi-tiered approach to improve pesticide management and decrease runoff. The different components support institutional strengthening and farmer training, enhanced regulatory/policy environments, field demonstrations and validation of GAP, coastal monitoring, knowledge management and regional networking/information dissemination. These components are interlinked and well-placed to address the technical, institutional and systemic barriers that the project is likely to face. However, the achievement of the overall objective is not fully attributable to UNEP or within its control. In this regard, UNEP has a largely catalytic role and project impact/sustainability is largely influenced by external variables such as national commitment, institutional capacity, financial/regulatory incentives and climatic factors.
Overall rating for Efficiency	Moderately Satisfactory: In spite of a preparatory PDF-B phase, deficiencies in project design and budgeting were identified by the PSC. These deficiencies, combined with the extended delay in the project's commencement, required an early revision of project timelines, work plans and budget.
Overall rating for Sustainability / Replication and Catalytic Effects	Highly Satisfactory: The project design has a strong catalytic role by supporting validation, dissemination and replication. A project component is devoted to on-site demonstrations of Good Agricultural Practices (GAP) and improved pesticide management in the three countries, and to disseminating lessons learned through established national partner institutions and regional information networks.
Overall rating for Risk Identification and Social Safeguards	Satisfactory: The risks affecting project implementation and the achievement of outputs are described in the corresponding section and logical framework of the project document.
Overall rating for Governance and Supervision Arrangements	Highly Satisfactory: Country ownership and stakeholder participation is encouraged through the creation of a Project Steering Committee (PSC), National Coordination Committees (NCCs) and the participation of key national institutions that are active in this sector.

Overall rating for Management, Execution and Partnership Arrangements	Satisfactory: The management, execution and partnership arrangements described in the project document are satisfactory for an initiative of this complexity and scale. Efforts are made to incorporate key national stakeholders under the NCCs and connect these to the PSC and UNEP/CAR.
Overall rating for Financial Planning / budgeting	Moderately Unsatisfactory: The approved project document contains several budget deficiencies that were identified by the PSC, prompting early revisions. Management and demonstration site costs were underestimated, as was the Agency overhead fee. During the MTE, the project team noted that the budget contained in the project document could not be reconciled, although the grand totals were the same.
Overall rating for Monitoring	Moderately Unsatisfactory: The approved project document does not have a Monitoring Plan. Nor are monitoring indicators included in project design, an oversight noted by the GEF Committee that approved the project. There are provisions for the coastal monitoring of environmental impacts associated with demonstrations of GAP and IPM. However, a significant part of the monitoring budget is allocated to project sub-component 3.1 rather than constituting a separate budget component for the entire project.
Overall rating for Evaluation	Moderately Unsatisfactory: Mid-term and Final Evaluations are foreseen in accordance with UNEP guidelines. However, funds were not budgeted for external evaluations in the approved project document.

Annex 7

Technical Working Paper

Terminal evaluations are generally held at (or shortly after) project completion. At this stage it is normally only possible to assess the achievement of project outputs. Possibilities for evaluating project *outcomes* are more limited, and the assessment of *impacts* constrained by the time lag that is often involved in their gestation. Project funds are seldom available to support *ex post* assessments of impacts once they have accrued, which may occur several years after the closure of the project.

Despite these difficulties, it is possible to enhance the scope and depth of information available on the achievement of results through review of project progress along the pathways that link outcomes to impact. This allows the Evaluator to identify the sequence of conditions and factors needed for project outcomes to yield impact, and to assess the current status of results and “intermediate states” that precede the achievement of the general objective.

As applied by UNEP evaluations, “Theory of Change” (TOC) depicts the logical sequence of desired changes (also called “causal / impact pathways” or “results chains”) to which the project or programme is expected to contribute. It shows the causal linkages between changes at different results levels (outputs, outcomes, intermediate states and impact), and identifies the factors influencing those changes. The reconstruction of a TOC can help in identifying linkages between expected outputs and outcomes, and the intermediary states between outcomes and desired impact. It is useful for indentifying the “*impact drivers*” that are needed to realize project outcomes, intermediary states and impacts; and the “*external assumptions*” that are reflected in project design and also affect performance, yet are often beyond the project’s ability to influence or address.

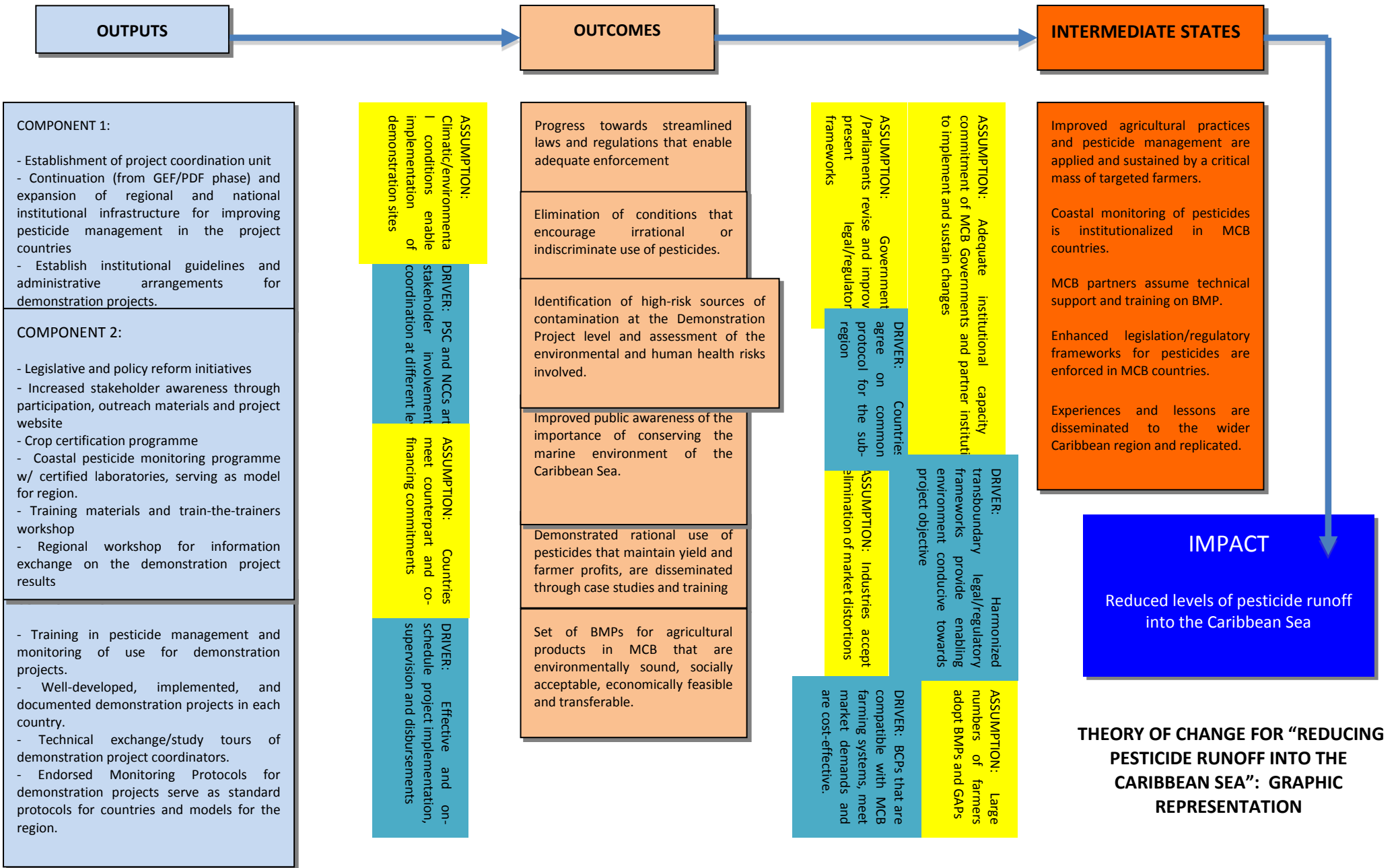
Figure 1 provides a graphic representation of causal pathways, based on the project’s logical framework. While the available space on the graph does not allow for the illustration of pathways by arrows or connecting lines, they can be described: The first project component focuses on establishing the project team and implementation/institutional arrangements, providing enabling conditions for all outcomes. On the other hand, the outputs grouped under Component 2 have causal links to specific outcomes. For example, legislative and policy reform initiatives would contribute to the outcomes of “progress towards streamlined laws and regulations that enable adequate enforcement”, as well as the “elimination of conditions that encourage irrational or indiscriminate use of pesticides”. The introduction of a crop certification programme is also likely to encourage sound pesticide management. The Component 2 output of coastal pesticide monitoring is essential to achieve the outcomes of identifying high-risk sources of contamination and their environmental/human health repercussions, and designing monitoring protocols for MCB countries. The outputs of increased stakeholder awareness through project outreach services and the production of training materials need to be generated in order to reach the outcome of improved public awareness on conserving the marine environment.

Under Component 3, the outputs of implementing demonstration projects and documenting their results are causally linked to the outcomes of demonstrating rational pesticide use and validating Best Management Practices (BMPs) that are environmentally sound, socially acceptable and economically viable. The adoption of monitoring protocols for demonstration sites as standard models for the region – another output under Component 3 – additionally leads to the identification of high-risk sources of contamination; whereas the output of providing training in pesticide management and monitoring also contributes to this outcome.

TOC analysis helps identify the causal pathways that connect project outcomes to the intermediate states that precede the desired impact. The outcomes of validated BMPs, demonstrated rational use of pesticides, and improved public awareness are conducive towards an intermediate state in which BMPs are adopted and sustained by a critical mass of farmers. Similarly, the intermediate state of enhanced and enforced pesticide policies are a consequence of the progress achieved in streamlining laws and regulations, and removing the conditions that encourage irrational pesticide use. The replication of BMPs within the greater Caribbean region – also an intermediate state – will depend on the availability of validated BMPs for rational pesticide use (which in turn derive from outputs in demonstration site implementation, training and information dissemination).

These causal pathways – and their contribution to project impact - rest on a set of assumptions that are in some cases outside the project's direct control. A fundamental assumption is that the project will be implemented effectively, on schedule and with adequate funding; and that participating countries will honor co-financing agreements and demonstrate political commitment and institutional capacity. Likewise, the assumption that there will be stable climatic conditions (in a sub-region that is prone to hurricanes and tropical storms) is critical to project success. The achievement of project outcomes and the ultimate objective is partially based on the assumption that a large number of farmers will adopt BMP and rational pesticide use; and that the recommended policy/regulatory measures will be politically viable, economically feasible and accepted by private industry.

In the same manner, the project's ability to move forward largely depends on the driving factors identified in Figure 1. Among the key drivers that are likely to influence project success are the Project Steering Committee and National Coordination Committees' ability to engage and articulate stakeholders at different levels; the capacity of MCB countries to harmonize policy measures, monitoring protocols and pesticide management guidelines to generate impact on a sub-regional scale; and the dissemination of best practices that are socially acceptable and cost-effective. The adherence of countries to the Cartagena Convention could offer an additional driver for moving the implementation process forward.



Annex 8

Brief CV of Evaluation Consultant

Hugo Navajas

Casilla 1310, Tarija, Bolivia

mobile 591-761 99680

hnavajas@yahoo.com

EDUCATION:

1984 - Masters Degree (MRP) in Regional Planning - Maxwell School of Citizenship & Public Affairs, Syracuse University USA

1978 - Undergraduate Degree (BA) in Cultural Anthropology - University of Arizona USA

KEY QUALIFICATIONS:

Design, evaluation and technical support of environmental management, sustainable development, poverty reduction and governance initiatives.

SPECIFIC COUNTRY EXPERIENCE:

Country Missions:

Latin America & Caribbean: Argentina (3/97, 2-3/2011); Belize (9/96); Bolivia (9-10/93, 5/94, 8/94, 12/95, 9/96, 2-6/2011); Brazil (2, 8-9/01, 4/2006); Chile (3/99, 7/2001, 7/2003, 4/2006, 9/2006); Colombia (10/95); Costa Rica (8/96); Cuba (4/98, 11-12/2001, 7/2004, 2/2005); Dominican Republic (6/99; 9/2000); Ecuador (10/97, 11/95, 4/2005, 8/2006), Guatemala (7/94, 11/95, 11/98 7/94, 4/2003); Guyana (4/2010); Honduras (8/95, 3/96, 4-5,8/2002); Jamaica (3/97, 4/2010); Mexico (5/2000, 9/2004, 4/2005); Nicaragua (8/99, 12/95); Peru (7/97, 9/2006); Tortola, BVI (3/97); Uruguay (10/97); Trinidad & Tobago (9/98); Venezuela (9/98; 9/2003);

Asia & Pacific: Bangladesh (5-7/2006), China (10-11/2000); South Korea (7/2003); Laos (5/2001, 9-11/2002)); Marshall Islands (10/2002); Mongolia (5-6/2003; 7-8/2005); Thailand (4/95; 1/2005).

Africa & Middle East: Egypt (4/99, 2/2000, 3/02); Jordan (7/03); Kenya (4/2005, 3/2006, 11/2011, 4/2012), Mozambique (2/98, 3/99); South Africa (11/97); Syria (2/2000); Tanzania (11/97; 7/2003); Turkey (2/2000; 4-5/2007); Yemen (8/01, 2/2003)

Central & Eastern Europe: Albania (2/2000); Macedonia (4/2004); Slovakia (3-4/2004; 5-6/2005); Slovenia (7/2003); Romania (6/2005), Ukraine (4/2004).

Fixed-Term Employment Contracts:

Bolivia (1/88-12/88); Honduras (7/91-5/93); Kenya (1/89-6/91); Mozambique (12/85-12/87); United States (7/78-6/82)

RELEVANT WORK EXPERIENCE:

11/2011-6/2012 Programme Evaluator United Nations Environment Programme (UNEP), Nairobi Kenya. Final evaluation of the UNEP Environmental Governance Sub-programme, which is one of four sub-programmes within UNEP's 2010-2013 Medium Term Strategy (MTS). The EGSP involves 5 UNEP Divisions and encompasses 18 outputs and 14 projects, with a total programmed budget of US\$ 139 million. Interviews with representatives of UNEP's Divisions, Regional Offices and Executive level; review of Sub-programme and project documentation; and preparation of a final evaluation report in collaboration with UNEP's Evaluation Office.

2-8/2011 Programme Evaluator/Team Leader Global Environment Facility (GEF), Washington DC and United Nations Environment Programme (UNEP), Nairobi Kenya. Final evaluation of the Implementation of the Strategic Program for the Bermejo River Binational Basin, a US\$ 11 million initiative encompassing the provinces of Salta, Jujuy, Formosa and Chaco in northern Argentina, and the department of Tarija in southern Bolivia. The programme was funded by GEF and implemented by UNEP, the Organization of American States (OAS) and the Bi-National Commission for the Bermejo Basin (COBINABE), with components addressing institutional strengthening and capacity building, erosion and flood control, biodiversity conservation and environmental education. Evaluation activities include (i) interviews with programme stakeholders at the central and provincial government level, the academic sector, NGOs and beneficiary communities among others, (ii) field visits to a project sample in both countries, and (iii) elaboration of a final evaluation report and technical report addressing structural measures.

6-11/2010 Programme Evaluator UNDP, New York. Final evaluation of the GEF Country Support Programme (CSP), a US\$ 11.8 million initiative offered in 128 countries to build national/sub regional capacities for accessing GEF funds and managing the GEF project cycle. Direct interviews with the project team based at UNDP Headquarters and representatives of the GEF Secretariat and Evaluation Office. Design and implementation of e-surveys directed at national GEF focal points that participated in the programme, followed by in-depth interviews with selected respondents. Review of project documentation, subregional workshop reports and the CSP web page. Drafting of the final evaluation report.

4-5/2010 Programme Evaluator UNDP Jamaica - Kingston Jamaica. Outcome evaluation of UNDP Jamaica's environment and energy portfolio under the 2007-2011 Country Programme. Interviews with UNDP senior management and programme staff, government counterparts and implementing partners. Visits to selected project sites. Review of relevant documentation and preparation of preliminary findings for Stakeholder Meeting. Elaboration of the evaluation report.

3-4/2010 Programme Evaluator/Team Leader UNDP Guyana - Georgetown Guyana. Outcome evaluation of UNDP Guyana's environment, energy and poverty reduction portfolio under the 2007-2011 Country Programme. Interviews with UNDP senior management and programme staff, government counterparts and implementing partners. Visits to selected projects. Review of relevant documentation and preparation of preliminary findings for Stakeholder Meeting. Elaboration of environment and energy components of the evaluation report, and incorporation/editing of sections addressing poverty reduction.

11/2009 – 1/2010 Consultant United Nations System Staff College (UNSSC) – Turin, Italy. Assessment of existing evaluation practices among 7 UN research and training institutes, considering levels of adherence to UN Evaluation Group (UNEG) guidelines, gaps and analysis/recommendations for harmonizing evaluation practices in the context of OneUN/Delivering as One. Elaboration of a report for circulation among the institutes, UNEG and the SG's Office.

9/2009 – 11/2009 Consultant UNDP - New York / UNEP - Nairobi. Assessment of trends and stakeholder perceptions regarding various forms of UNDP - UNEP collaboration, both within and outside the One UN/Delivering as One context. Preparation of a global inventory of UNDP-UNEP collaboration, grouping initiatives by theme/strategic objective, region and country. Consultations with UNDP, UNEP and partner focal points through on-line surveys and questionnaires. Elaboration of inventory and forward-looking assessment reports for the UNDP-UNEP Working Group.

4 – 8/2009 Project Evaluator UNEP, Nairobi. Final evaluation of the Biosafety Clearinghouse Project (BCH Phase I), a US\$ 14.9 million capacity development initiative implemented in 112 countries to support the Cartagena Protocol on Biosafety. Consultations with project staff based in Geneva and Nairobi, review of documentation and country visits to Mongolia, Ethiopia, Albania, Guatemala and Uruguay. Preparation and processing of on-line surveys to national coordinators and regional advisors. Formulation of the final evaluation report.

12/2008 Consultant UNDP – New York. Preparation of a draft concept paper for the Local Capacity Pillar (LCP) within the Environment & Energy Group of UNDP's Bureau for Development Policy. The LCP is intended to link diverse UN initiatives supporting community-based capacity development, small grants, environmental conservation and advocacy networks under a programmatic approach, in order to enhance their relevance, aggregate impact and rational use of resources. Consultations with resource persons and potential partners from the EEG, BDP, regional bureaux and other UNDP divisions and initiatives. Elaboration of draft concept paper outlining objectives, modalities and areas of intervention.

9-11/2008 Project Evaluator UNEP – Nairobi. Final evaluation of the UNEP/Belgian Partnership covering the 2004-2008 period. Under the partnership, the Government of Belgium provided US\$ 12 million to support programmes for implementing the Global Plan of Action (GPA) for marine and coastal zone protection, designing National Action Plans for coastal/river basin conservation and integrated waste management; integrating environmental priorities within Poverty Reduction Strategies; strengthening national legislation and participation to implement Multilateral Environmental Agreements (MEAs); and implementing demonstration projects. The evaluation included the desk review of relevant documentation, interviews with programme managers at UNEP Headquarters, design/dissemination of an on-line survey to programme recipients, and field visits to Peru and Bangladesh. Elaboration of Final Evaluation Report.

6-7/2008 Project Evaluator UNEP – Nairobi. Mid-term evaluation of "Enhancing conservation of the critical network of sites required by Migratory Waterbirds on the African/Eurasian Flyways" (Wings Over Wetlands), a US\$ 6 million initiative funded by the Global Environment Facility (GEF) and implemented by UNEP in 12 countries of the African and Eurasian regions. Interviews with the Project Coordination Unit, Steering Committee and institutional partners in Wetlands International, Bird Life International, UNEP, Africa Eurasian Waterbirds Agreement (AEWA) and Government of Germany. Design and processing of on-line surveys targetting stakeholder groups in the participating regions. Desk review of relevant documentation. Elaboration of Mid-Term Evaluation Report.

Annex 9

The Effects of Demonstration Projects on Pesticide Use in Urabá, Colombia

<i>BEFORE</i>	<i>AFTER</i>
<i>High pesticide consumption due to limited knowledge of appropriate products and dosage.</i>	<i>Pesticide applications were reduced on average by more than 20% on demonstration sites.</i>
<i>Self-selection of products and dosage</i>	<i>Consultations with technicians are now made</i>
<i>Little use of occupational safety equipment in handling pesticides</i>	<i>Farmers are aware of the ways of self-protection, and of the equipment required.</i>
<i>The proper spouts for spraying herbicides were not used</i>	<i>General use of recommended spouts for systemic and contact herbicides.</i>
<i>Bad practices during pesticide applications (such as consuming food)</i>	<i>Adoption of good practices, including segregation of pesticide/banana handling from other activities.</i>
<i>Sprayers were not calibrated</i>	<i>General practice of calibrating sprayers for economic savings and environmental benefits.</i>
<i>Bad practices in storage and disposal of pesticides</i>	<i>Triple washing of containers, proper storage and disposal with authorized personnel. Residues are disposed in traps or filters designed for this purpose.</i>
<i>Bad practices in hygiene post-pesticide application.</i>	<i>Installation and use of showers, use of containers in good condition and triple washing of used containers.</i>

Source: Experiencias en BPA y Protección del Medio Ambiente GEF –REPCar (Augura, 2011)

Annex 10

List of Project Publications

- UNEP-CAR/RCU, 2012. Improving the management of agricultural pesticides in Colombia, Costa Rica and Nicaragua, Experiences of the GEF Reducing Pesticides Runoff to the Caribbean Sea Project. Available in Spanish and English.
- UNEP-CAR/RCU, 2012. Agricultural Pesticides Residues in Caribbean Coastal Waters. Colombia, Costa Rica and Nicaragua 2008-2011. Available in Spanish and English.
- UNEP-CAR/RCU, 2009. Guidelines for the collection, preparation and analysis of organic contaminants in environmental samples. Coastal Monitoring Programme of the GEF- Reducing Pesticides Runoff to the Caribbean Sea Project. Available in Spanish and English.
- Asociacion de bananeros de Colombia, 2011. Experiencias en BPA y Protección del Medio Ambiente; Buenas Prácticas promovidas por GEF Reduciendo el Escurrimiento de Plaguicidas al Mar Caribe. (Publicación final Nacional de Colombia)
- Sociedad de Agricultores de Colombia, 2010. Protocolo de buenas prácticas agrícolas. programa de capacitación 2010.
- Asociacion de bananeros de Colombia, 2009. Buena Prácticas Agrícolas en el cultivo del banano en la región del Magdalena. Available in Spanish and English.
- Asociacion de bananeros de Colombia, 2009. Buena Prácticas Agrícolas en el cultivo de plátano de exportación en le región del Urabá. Available in Spanish and English.
- Asociacion de bananeros de Colombia, 2009. Uso seguro de plaguicidas e insumos agrícolas. Available in Spanish and English.
- Asociacion de bananeros de Colombia, 2009. Identificación y manejo integrado de plagas en banano y plátano, Magdalena y Urabá, Colombia.
- Sociedad de Agricultores de Colombia, 2009. Programa de capacitación. Planeador de actividades de buenas prácticas para reducir el escurrimiento.
- Sociedad de Agricultores de Colombia, 2009. Buenas prácticas para reducir el escurrimiento de plaguicidas. Memorias del programa de capacitación 2007-2009.
- Asociacion de bananeros de Colombia, 2011. Mantenimiento y calibración de aspersores manuales en pequeños cultivos de banano y plátano.
- Asociacion Nacional de Industriales, 2012. Guía ambiental del sector de plaguicidas. (In review).
- Costa Rica
- Ministerio de Ambiente, Energía y Telecomunicaciones, 2011. REPCar en Costa Rica, Experiencias exitosas para reducir el impacto de la agricultura sobre los ecosistemas costeros. (Publicación final nacional de Costa Rica)
- Corporación Bananera Nacional, 2011. Manual de Buenas Prácticas Agrícolas en el cultivo de banano.
- Proagroin, 2011. Guía para la identificación y manejo integrado de plagas en piña. Available in Spanish and English.
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Source: GL 4880 Final Report

Annex 11

Pesticides analyzed under the Coastal Monitoring Programme

<u>Fungicidas aromáticos</u> Clortalonil	<u>Herbicidas uracil</u> Bromacil
<u>Herbicidas triazinas</u> Ametrina Atratón Atrazina Prometón Prometrina Propazina Secbumetón Simetrina Simazina Terbutilazina Terbutrina	<u>Herbicidas urea</u> Diurón
<u>Insecticidas carbamatos</u> Carbaril Carbofurán Oxamil	<u>Insecticidas organoclorados</u> Aldrín α -clordano Dieldrin p,p'-DDD p,p'-DDE p,p'-DDT Endosulfán I Endosulfán II Endosulfán sulfato Endrín Endrín aldehído Endrín cetona α -HCH β -HCH δ -HCH γ -HCH (Lindano) Heptacloro Heptacloro epóxido Metoxicloro
<u>Insecticidas organofosforados</u> Clorpirifós Diazinón Fenamifós Metilparatión	
<u>Insecticidas piretroides</u> Permetrina	

Source: *Residuos de Plaguicidas Agrícolas en Aguas Costeras del Caribe (RepCar 2011)*

Annex 12

Lessons Learned by the RCU and Project Partners³³

Project Coordination

- Coordination of the project with national committees that have ample stakeholder participation from the public and private sectors requires more time when compared to interventions that work directly with implementing agencies with no extensive national consultation processes. However, this mechanism contributes positively to the quality of the projects and its coherence with national needs and priorities.
- A long period of time between project development and initiation leads to the need to re-evaluate the baseline project, the coordination and implementation mechanisms and the workplans. It may also affect the ownership of the countries as governments and policies change over time.
- It is crucial for the development of this type of interventions to promote inter-institutional cooperation within the public sector and between the public and private sectors. When a positive climate exists preceding project initiation, there is an increased likelihood of success in achieving the objectives of the project.
- Good ownership is obtained when projects are designed with the input of national stakeholders (National Committees) and formulated by the implementing agencies, with minimal external consultants. This process is more time consuming and requires more follow-up from the project coordination units when compared to using external consultants, but it strengthens the capacities in project countries, increases ownership and the likeliness that the interventions will respond to real needs. This increased capacity and ownership is also more likely to improve the sustainability of the intervention.
- Regional meetings with ample time for discussions and field trips to demonstration projects were an effective tool to promote south-south cooperation, where countries with less experience and know-how can learn from the progress made in more advanced countries.

Demonstration projects on GAP and training and awareness raising

- The reduction of the use of pesticides is one of the objectives of Integrated Pest Management Programmes. Pest management can not be seen as an isolated aspect of the management of the crop and strategies to reduce the dependency on pesticides have to be part of a comprehensive approach to Integrated Farm Management and Good Agricultural Practices.
- Many Integrated Pest Management technologies are economically viable and produce environmental benefits, not fully tapped by the farmers. Several reasons for this are deficient technical capacity and cultural and economic aspects that lead growers to favour pesticides over other control mechanisms. Demonstration projects were instrumental in overcoming these hurdles, capturing technologies that had been developed in research stations but seldom applied by farmers. The technical and scientific validation of the different innovative practices brought about a significant reduction in the use of synthetic

³³ Source: GL4880 Final Report (2011)

pesticides on the demonstration crops of pineapples and bananas in Costa Rica, bananas and plantains in Colombia and beans and oil palm in Nicaragua. A reduction in the short-term use of herbicides proved to be quite viable in select crops, whereas technological development is required for a more substantial reduction in fungicide use.

- The dissemination and adoption of GAP is much more difficult, less efficient and more time consuming when organizational frameworks are absent or weak. Commercial corporations that have stable relationships with individual farmers can also contribute greatly to the adoption of GAP by small producers, providing technical assistance and support. Engaging farmers with recognized leadership qualities in the project demonstration sites has contributed significantly to the dissemination of good agricultural practices and their acceptability by local farmers in the surrounding areas.
- The implementation of GAP among farmers is much more likely where acceptability is market driven, particularly through GAP certification schemes that result in greater access to markets or better economic benefits. These incentives are present in international markets but still largely lacking on the national markets in the region, with the exception of some certified organic produce and starting GAP certification initiatives in Colombia and Costa Rica.
- For any innovations to be successfully adopted and sustainable, they need to increase the competitiveness of a farming system, being cost effective or giving commercial benefits.
- The formulation, design and successful implementation of capacity building strategies need to take into account the cultural idiosyncrasies and attitudes of the beneficiary communities. Capacity building is most effective using small groups of 5-10 producers, utilizing teaching methodologies applied directly in the field (demonstration sites or farms of participating local producers). Regular, close follow-up and provision of advisory services to participating farmers is critical in order to increase the likelihood of adoption of good agricultural practices.
- Raising the awareness of producers on the risks posed by the unsustainable use of pesticides to the environment and their health and to the sustainability of their business through access to markets is critically important if project activities, particularly the adoption of GAP, are to be successfully extended. Some farmers tend to ignore or neglect the possible effects of pesticides on their health.

Monitoring of pesticides residues by the coastal monitoring programme

- The development of a locally implemented pesticides monitoring programme is only feasible when there is important pre-existing capacity in centres of excellence in environmental research and coastal and marine research. Excellence in laboratory management and the implementation of quality control programmes are essential elements to heighten the credibility of the results and accomplish a sense of ownership in the private sector.
- It is possible to manage the potential conflict of interests of the private sector participation in this type of projects, by allowing representatives of the pesticides industry to participate as observers and advisors of the monitoring programme, without giving these partners a decisive role. Their participation as observers increases the ownership of the results of the private sector and generates willingness to share critical information and take corrective actions.
- Overall, pesticide levels in coastal areas in the Western Caribbean are low and do not pose an immediate environmental threat. It does not mean that monitoring should cease

since it is necessary to prevent greater impact in the future. Most of the frequently encountered pesticides were organochlorine insecticides, which are persistent compounds, and although banned, there are indications of some recent use. Also pesticides presently in use were detected and should be further addressed in future programmes.

- Given the political controversies and eventual economic implications associated with environmental pollution, environmental authorities and private sector partners are hesitant to provide information generated on pesticides residues in the environment. It is then important to balance the discretion in the management of the information with the dissemination of important and general results towards project stakeholders.
- Public reaction to and opinion on information provided on the presence of pesticides in the environment is often based on misunderstanding and erroneous interpretation. When monitoring results are published, these should always be accompanied with a sound interpretation in language that is easily comprehended by the common reader.

Sustaining Improvements and Education and Information Dissemination

- Overall, the legal frameworks that regulates the use and management of pesticides are adequate, but the countries lack the resources for the enforcement of these frameworks. Public-private sector partnerships can support the enforcement through the work of regional agencies such as CropLife LA.
 - The likelihood of sustainability of the implementation of new and more environmentally-friendly practices is higher in a country that has more political commitment and policies prioritizing the importance of promoting such practices and the elimination or mitigation of pesticide pollution.
 - Sustainability of GAP activities is closely linked to demands in the market and the economic benefits generated, such as increasing the competitiveness and marketability of crops. Fresh fruits that are retailed in European and North American markets may need to comply with requirements under different GAP certification schemes such as GLOBALGAP, Rain Forest Alliance and ISO 14000.
 - Much progress is observed in the export sector after GAP implementation, formalized in certificates such as GlobalGAP or Rainforest Alliance. In turn, producers that only supply the national market are not under the pressure of commercial chains to implement GAP and certify their production processes. All progress made in the export sector should become a lesson for producers that only supply the local markets. On the other hand, retailers and consumers of the region are not sufficiently aware of the benefits of commercializing and consuming products certified under GAP.
 - The application of GIS techniques is important to facilitate the interpretation of the extent of pesticide pollution at the country level. The UNEP-CAR/RCU is playing a key role in effectively processing and integrating information generated by REPCar participating countries and making it available on the internet using GIS techniques in different formats. This will also contribute to the longer term continued use of the UNEP CAR/RCU web site as a Clearing House Mechanisms for information dissemination.
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