

PROJECT REVIEW SHEET

Work Program Inclusion - UNEP International Waters

Project Title: "Colombia, Costa Rica, Nicaragua - Reducing Pesticide Runoff to the Caribbean Sea"

Date: 7 January, 2002

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
1. Country Ownership		
• Country Eligibility		• The participating countries are eligible under paragraph 9b of the GEF Instrument – see cover page.
• Country Drivenness	Clear description of Project’s fit within: <ul style="list-style-type: none"> • National reports/communications to Conventions • National or sector development plans. • Recommendations of appropriate regional intergovernmental meetings or agreements. 	• The project is set in the context of the land-based sources protocol to the Cartagena Convention, which all participating countries are committed to signing and ratifying (para 11).
• Endorsement	• Endorsement by national operational focal points	• Section 4 of the cover page contains a table with dates of endorsement by all participating countries’ GEF Operational Focal Points.
2. Program & Policy Conformity		
• Program Designation & Conformity	Describe how project objectives are consistent with Operational Program objectives or operational criteria	• The project is consistent with the objectives of Operational Program #10, and is part of the OP10 GEF strategy that was agreed upon with the GEF Secretariat – see paragraph 12.
• Project Design	Describe: <ul style="list-style-type: none"> • Sector issues, root causes, threats, barriers etc affecting global environment • Project logical framework, including a consistent strategy, goals, objectives, outputs inputs/activities, measurable performance indicators, risks and assumptions • Detailed description of goals, objectives, outputs and related assumptions, risks and performance indicators • Brief description of project activities, including 	<ul style="list-style-type: none"> • The issues, barriers and threats to be addressed by this project are described in para 1-6, and incremental costs and root cause annexes (A and D). Chiefly, the issue is that of excessive pesticide use in tropical agriculture, and consequent impact on international waters. • The overall goal is the protection of the marine environment of the Caribbean Sea. Project outcomes are detailed in the logical framework matrix (Annex B). These include: the provision of necessary incentives, training and education so that farmers and other stakeholders understand the importance of implementing BMPs in pesticide management; availability of information and technology gained from the demonstration projects so that more farmers and

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
	<p>an explanation how the activities would result in project outputs (in no more than 2 pages)</p> <ul style="list-style-type: none"> • Global environmental benefits of the project. • Incremental cost estimation based on the project logical framework <ul style="list-style-type: none"> • Describe project outputs (and related activities & costs) that result in global environmental benefits • Describe project outputs (and related activities & costs) that result in global and national environmental benefits • Describe project outputs (and related activities & costs) that result in national environmental benefits • Describe the process used to jointly estimate incremental cost with in-country project partner • Present the incremental cost estimate. If presented as a range, then a brief explanation of the challenges and constraints and how these would be addressed by the time of CEO endorsement. 	<p>other stakeholders will implement these practices and continue to do so in a sustainable manner after project completion; and strengthened institutions in the Meso Caribbean Basin promoting improved pesticide management.</p> <ul style="list-style-type: none"> • A detailed logical framework is included as Annex B. Objectively verifiable indicators include a set of documented case studies and validated Best Management Practices. • Activities are grouped into 3 major components and include: Project coordination and stakeholder Participation; Demonstration Projects; and Institutionalizing improved pesticides management and strengthening capacity for reducing pesticides runoff. • The incremental costs analysis in annex A describes the national, regional, and global benefits to be expected from the project. The regional/global environmental benefits stem from the global significance of the Caribbean Sea, which the project will protect. • The participating countries will contribute to baseline costs in relation to the domestic benefits that can be expected from the project.
<ul style="list-style-type: none"> • Sustainability (including financial sustainability) 	<p>Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors</p>	<p>Issues regarding sustainability are discussed in paragraphs 30 – 31. The sustainability of the overall project is linked to the wider adoption of the best management practices that will be demonstrated during the project.</p>
<ul style="list-style-type: none"> • Replicability 	<p>Describe the proposed approach to replication (for e.g. dissemination of lessons, training workshops, information exchange, national and regional forum etc.) (could be within project description)</p>	<p>The nature of the project implies replicability both within each participating country, and to the benefit of other developing countries throughout the tropical world. The whole project design is geared toward ensuring replicability.</p>
<ul style="list-style-type: none"> • Stakeholder Involvement 	<ul style="list-style-type: none"> • Describe how stakeholders have been involved in project development • Describe the approach for stakeholder involvement in further project development and implementation 	<ul style="list-style-type: none"> • Primary stakeholders are the farmers, agrochemical distributors, health, agricultural and environmental ministries and agencies, environmental NGOs and other community-based organizations, relevant international organizations, and academic institutions. They have been involved in the development of the project through the

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
		<p>national coordinating committees that were put into place - see para 32-36.</p> <ul style="list-style-type: none"> • Project implementation relies on a multi-stakeholder national coordinating committee at the national level (para 22 and TOR annex F).
<ul style="list-style-type: none"> • Monitoring & Evaluation 	<ul style="list-style-type: none"> • Describe how project design has incorporated lessons from similar projects in the past • Describe approach for project M&E system, based on the project logical framework, including the following elements: <ul style="list-style-type: none"> • Specifications of indicators for objectives and outputs, including alternate benchmarks, and means of measurement. • Outline organisational arrangement for implementing M&E • Indicative total cost of M&E (may be reflected in total project cost). 	<ul style="list-style-type: none"> • Project design has benefited from the experience of the various stakeholders involved in its preparation: from the private sector (LACPA) to non-for-profit academic institutions (EARTH). • Indicators for individual objectives and outputs are described in Annex B. The Monitoring Protocol Advisory Panel which will be established will design the process and stress reduction indicators which will be used to assess project success. • The demonstration projects will be regularly evaluated by the National Coordinating Committees. • Monitoring of project progress will be the primary responsibility of the UNEP GEF Co-ordination Office and the Bureau of Fund Management Services and will be undertaken via Quarterly Operational Reports, half yearly and end of year financial and substantive reporting in accordance with UNEP's internal guidelines for project monitoring and evaluation. • A mid-term and terminal evaluation will be conducted in collaboration with the GEF Co-ordination Office of UNEP. • The indicative cost of the M&E related activities for the Implementing Agency is 68,000 US\$ and is included within the Implementing Agency Fee.
3. Financing		
<ul style="list-style-type: none"> • Financing Plan 	<ul style="list-style-type: none"> • Estimate total project cost. • Estimate contribution by financing partners. • Propose type of financing instrument 	<ul style="list-style-type: none"> • Total project cost is estimated at 10.34 million US\$ - see cover page and budget table 3. • Estimated contribution from financing partners is 5.75 million US\$ (including in-kind contributions) - see cover page. • Grant financing.
Implementing Agency Fees	Propose IA fee	<ul style="list-style-type: none"> • 382,000 US \$ based on the agreed flat fee.
<ul style="list-style-type: none"> • Cost-effectiveness 	<ul style="list-style-type: none"> • Estimate cost effectiveness, if feasible 	<ul style="list-style-type: none"> • The approach adopted to rely heavily on demonstration activities

	Work Program Inclusion per criteria established in Draft # 8 of the project review criteria	Reference Paragraphs and Explanatory Notes:
	<ul style="list-style-type: none"> Describe alternate project approaches considered and discarded 	provides a cost-effective way to facilitate widespread adoption of the prescribed practices.
4. Institutional Coordination & Support		
<u>IA Coordination and Support</u> <ul style="list-style-type: none"> Core commitments & Linkages 	Describe how the proposed project is located within the IA's <ul style="list-style-type: none"> Country regional/global/sector programs GEF activities with potential influence on the proposed project (design & implementation) 	<ul style="list-style-type: none"> The project is to be implemented within the framework of UNEP's Regional Seas Programme, support to the GPA, and activities in Chemicals Management, including early implementation of the POPs Convention. Links will be established with relevant activities. In particular, linkages with the proposed UNEP/PAHO project on DDT alternatives in Central America are described in para 36.
<ul style="list-style-type: none"> Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate. 	<ul style="list-style-type: none"> Describe how the proposed project relates to activities of other IAs and 4 RDBs in the country/region. Describe planned/agreed coordination, collaboration between IAs in project implementation. 	<ul style="list-style-type: none"> Project development benefited from the involvement of a number of agencies at the steering group level, in particular FAO.
5. Response to Reviews		
Council	Respond to Council comments at pipeline entry	N/A
Convention Secretariat	Respond to comments from Convention Secretariat.	N/A
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	N/A
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBs on draft project brief.	Comments received from WB are supportive and responded to in Annex C1.
STAP	Respond to comments by STAP at work program inclusion.	N/A
Review by expert from STAP Roster	Respond to review by expert from STAP roster	Comments received from STAP roster expert are supportive, and responded to in annex C1.

PROJECT BRIEF

1. IDENTIFIERS

PROJECT NUMBER:	<i>[Implementing Agency Project Number not yet assigned]</i>
PROJECT TITLE:	Regional (Colombia, Costa Rica, Nicaragua): Reducing Pesticide Runoff to the Caribbean Sea
GEF IMPLEMENTING AGENCY:	United Nations Environment Programme
EXECUTING AGENCIES:	Secretariat for the Cartagena Convention – (UNEP-CAR/RCU); Ministerio del Medio Ambiente y Recursos Naturales, Nicaragua; Ministerio del Ambiente y Energía, Costa Rica; Ministerio del Medio Ambiente, Colombia
REQUESTING COUNTRIES:	Regional: Mesoamerican Caribbean Basin -- Colombia, Costa Rica, Nicaragua
ELIGIBILITY:	The participating countries are eligible under paragraph 9(b) of the GEF Instrument.
GEF FOCAL AREA:	International Waters
GEF PROGRAMMING FRAMEWORK:	Operational Programme 10 - Contaminant-based OP

2. SUMMARY

This project will demonstrate reduced pesticide runoff to the Caribbean Sea through improved pesticide management throughout the life cycle of pesticides (from manufacture to application and ultimate fate). Project elements include monitoring and assessment of impact; technology alternatives to intensive pesticide use and management practices to reduce runoff and runoff impact; education and training; development of incentives/institutional strengthening; and information management and dissemination. Demonstration projects will be the means of co-ordinating these various elements and will be the basis from which sustainable and widespread interventions will be developed and implemented in the region. Best management practices, training, monitoring, and other elements tested through the demonstration projects will be documented and widely disseminated to facilitate their adoption in the other countries of the Wider Caribbean and beyond.

3. COSTS AND FINANCING (MILLION US \$)

GEF:	Project	:	4.290
	PDF-B	:	0.295
	Subtotal GEF	:	4.585
Co-financing:	PDF-B (all sources)	:	0.127
	Governments of the three participating countries		
	in cash & kind	:	5.185
	UNEP (in kind)	:	0.070
	LACPA (in cash and kind)	:	0.240
	Other (academia and NGOs)	:	0.130
	Subtotal Co-financing	:	5.752
Total Project Cost:		:	US\$ 10.337

4. Operational Focal Points Endorsements

Colombia

Claudia Martinez Zuleta, Minister, Ministry of Environment

Endorsement received 27/9/01.

Costa Rica

Elizabeth Odio Benito, Minister, Ministry of Environment and Energy

Endorsement received 27/9/01.

Nicaragua

Roberto Stadthagen Vogl, Minister, Ministry of Environment and Natural Resources

Endorsement received 27/9/01.

5. IA Contact:

Mr Ahmed Djoghlafl, Executive Co-ordinator, UNEP/GEF Co-ordination
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LIST OF ACRONYMS

a.i.	Active ingredient
AMEP	Sub-programme of the Caribbean Environment Programme of UNEP on the Assessment and Management of Environmental Pollution
BMP	Best Management Practices
CEP	Caribbean Environment Programme
CEPNET	Sub-programme of CEP on Environmental Information Systems
EARTH	Escuela de Agricultura de la Región Tropical Húmeda (Agricultural School for the Humid Tropics)
FAO	Food and Agriculture Organization
GAP	Good Agricultural Practice
GNP	Gross National Product
GEF	Global Environment Facility
GPA	Global Programme of Action for the Protection of the Marine Environment from Land Based Activities
ha	hectare
ICM	Integrated Crop Management
IEP	Independent Evaluation Panel
IICA	Instituto Inter-Americano de Cooperación Agrícola (Inter-American Institute for Agricultural Co-operation)
IPM	Integrated Pest Management
ISO	International Standards Organisation
IW-LEARN	GEF International Waters web-based knowledge sharing project
IWM	Integrated Waste Management
IWRN	Inter American Water Resources Network
LACPA	Latin American Crop Protection Association
LBS	Land-based Sources of Marine Pollution
MCB	Mesoamerican Caribbean Basin
NCC	National Co-ordinating Committee
NGO	Non-governmental Organization
PAHO	Pan American Health Organization
PAN	Pesticide Action Network
PDF-B	Project Preparation and Development Facility Block B
PIC	Prior Informed Consent
PSC	Project Steering Committee
RPR	Reducing Pesticide Runoff
TOR	Terms of Reference
UNEP	United Nations Environment Programme
UNEP-CAR/RCU	UNEP's Regional Co-ordinating Unit for the Caribbean
US EPA	United States Environmental Protection Agency
WCR	Wider Caribbean Region

OTHER TERMS

Cartagena Convention: Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, adopted 1983, Cartagena.

PROJECT DESCRIPTION

Background & Context (Baseline course of Action)

1. The Wider Caribbean Region (WCR) comprises the marine environment of the Gulf of Mexico, the Caribbean Sea and the 200-mile zone of the Atlantic Ocean adjacent to the countries in the region. The Caribbean Sea Large Marine Ecosystem is a sub-oceanic basin of the WCR, bounded to the south by South America and Panama, to the west by Central America and the Yucatan Peninsula of Mexico and partially enclosed to the north and east by the Islands of the West Indies. The sub-region of the Caribbean Sea covered by this project - the Mesoamerican Caribbean Basin (MCB) -- is the specific region of the southwestern Caribbean Sea bordered by four countries, Nicaragua, Costa Rica, Panama, and Colombia.

2. Agriculture is critical to the economies of the countries of the MCB sub-region, which produces a significant portion of the world's coffee (12%), plantains (10%), fresh fruits (9%) and bananas (8%) and also significant quantities of pineapples, sugar cane, ginger, oil palm, and flowers. Even with the increase in tourism in this sub-region during the past decade, export-oriented agricultural production still remains the main source of foreign exchange earnings. The agricultural sector provides approximately 32% of the gross national product (GNP) in Nicaragua, 19% in Colombia and 18% in Costa Rica.

3. Increasing world demand for cash crops and the growth in competition for a share of global markets have resulted in significantly increased pesticide use in the sub-region. Government subsidies and tax incentives that encourage farmers to rely on chemical-based methods of pest management have also contributed to this trend. In recent years, however, some importing countries have put pressure on exporting developing countries to reduce the use of the most toxic and persistent pesticides through the setting of maximum pesticide residue levels in the products imported. Some regional precedents also exist to turn agricultural market forces into a positive environmental benefit. Eco-friendly products such as organic produce or more recently “sustainably-grown” produce have their places in niche markets and such markets are widening as consumers become more environmentally aware.

4. In 1999, the MCB countries imported more than 14,600 metric tons (a.i.)¹ of pesticides and formulated an additional 13,300 metric tons (a.i.) solely for agricultural use on close to 3 million hectares for 21 principal crops for the region. These pesticides include insecticides that are severely restricted or banned for use in developed countries (e.g. *methamidophos*, *phosphamidon*, *methyl parathion*, and *monocrotophos*, which are covered by the Prior Informed Consent Procedure; and *carbofuran* and *malathion*). Also included are 29 pesticides (including 23 insecticides) that are federally registered as

¹ In any pesticide product, the active ingredient (a.i.) is the component that kills, or otherwise controls, target pests. Pesticides are regulated primarily on the basis of active ingredients. Few pesticide substances are sold commercially without being mixed with other inactive ingredients (carriers, diluents, solvents, wetting agents, emulsifiers, etc.). Nonetheless, it is the active ingredient that is of greatest concern in relation to secondary impacts (runoff and negative environmental impacts) and is therefore used as the unit of measure rather than the total amount of a pesticide.

restricted use pesticides in the United States. Several other pesticides recognised as highly toxic are also imported and used in the MCB countries. These include *endosulfan*, *carbofuran*, *phorate*, *terbufos*, *diazinon*, *malathion*, *oxamyl*, *acephate*; *zineb*; and *paraquat*. Additionally, *DDT*, although not reported to be used on agricultural crops, is stockpiled in the three countries and is still being used for vector control for malaria and dengue.

5. The data and information gathered during the PDF-B phase confirm that discharge and runoff of pesticides to surface or ground waters occur as the result of a variety of activities. The indiscriminate use and inappropriate application of pesticides are responsible for agrochemicals reaching non-target organisms. But the mishandling of pesticides such as spills, improper storage, and improper rinsing and disposal of pesticide containers has also led to the accumulation of pesticides in surface or ground waters. Moreover, transport by wind and runoff often result in the introduction of agricultural pesticides into aquatic systems even when they are properly applied. Many of these risks can be significantly reduced, however, through proper agricultural practices.

6. Continued pesticide runoff to the Caribbean Sea carries with it many environmental risks. The inappropriate and indiscriminate use of agricultural pesticides causes health hazards, both to humans and the coastal environment and its associated coastal economies. With the deterioration of the marine and freshwater environments in these countries, incidences of human poisoning and wildlife kills are commonplace. Excessive pesticide use can also lead to soil contamination and degradation which induces phytotoxicity and pest resistance and consequent low productivity and higher costs of production.

7. During the past two decades, evaluations of the effects of pesticides on non-target organisms and their transport away from areas of application to soils and surface and ground waters have been carried out in the MCB countries. Very little, however, has been done to systematically organize the information. Moreover, it is often not possible to compare data from different sources because different methods were used for data collection and analysis. Furthermore, data is not always publicly available. Despite these limitations, all three countries presented information in National Reports, which were produced as an output of the PDF-B, to support the hypothesis that a considerable proportion of applied pesticides were not reaching target organisms, but were entering waterways and groundwaters and, eventually, the Caribbean Sea. A number of studies conducted in Colombia, for example, confirm the presence of pesticides in surface and ground waters at levels in excess of those recommended as safe for human health and aquatic life by the US EPA. Agrochemicals encountered include *DDT*, *dieldrin*, *lindane*, *endosulfan*, *malathion*, *diazinon* and *aldrin*. In Nicaragua, it was estimated that at least 13 metric tons (a.i.) of pesticides reach the Caribbean Sea yearly through national waterways. Pesticides of particular concern and of interest for further study and evaluation of impacts are: *chlorpyrifos*, *ametryn*, *pendimethalin*, *diuron* and *endosulfan*.

8. The PDF-B, through the work of National Committees and through the completion of the National Reports, has demonstrated that a large number of national stakeholders, including governments (ministries of agriculture, environment and health), NGOs, scientific institutions and local communities are concerned about the potential environmental and health impacts of pesticide runoff. In the MCB

countries, the government ministries, in co-operation with the private sector, are committed to improving the management and control of the use of pesticides. Indeed, in recent years, all countries have taken steps to limit the risks to human health and the environment from the misuse of pesticides. For example, several government agencies in Colombia have proposed programmes to improve procedures for the use and management of pesticides. In Costa Rica, regulations on trade, handling, and use of pesticides have been developed. In Nicaragua, legislation is being developed to improve the management of pesticides with the aim of reducing contaminant releases to watercourses and coastal waters. (Complete information on the current practices and initiatives of the countries can be found in the National Reports and is synthesized in the Regional Report developed during the PDF-B. See Annex E for the list of publications prepared during the PDF phase.)

9. IPM and pesticide health programmes are active in the region, including CATIE IPM programmes in Nicaragua, PlagSalud also in Nicaragua, CIALs through CIAT in Colombia and policy studies carried out in Costa Rica with assistance from the Pesticide Policy group in the University of Hanover. These programmes, in addition to activities such as Better Banana project, Fair Trade, or organic agriculture associations, provide a source of regional expertise in pest management, health study, and pesticide policy.

10. These initiatives, however, are not carried out in a sufficiently systematic and coordinated manner to ensure adequate protection of human health and the environment. These initiatives are based on causal chain analyses carried out during PDF-B phase and were discussed during the national and regional pesticides management workshops that were conducted in the framework of the PDF-B phase. This project sets out to address these causes. A diagram of the problem and its cultural/social, institutional, market and the technical root causes identified in these studies is included in Annex D.

11. Regional and global efforts have also focused on the environmental threats posed by the presence of pesticides in aquatic systems. In October 1999, the Contracting Parties to the Cartagena Convention adopted a Protocol to the Convention Concerning Pollution from Land-based Sources and Activities (LBS Protocol). Annex IV to this LBS Protocol specifically requires that Parties develop national plans to prevent, reduce and control the runoff of pollutants from agricultural lands. Colombia and Costa Rica are already parties to the Cartagena Convention. Colombia and Costa Rica have also signed the LBS Protocol, signalling their intent to ratify it. Nicaragua is currently taking action to accede to the Cartagena Convention and to ratify the LBS Protocol simultaneously. The project proposed here will offer the added benefit of assisting the participating countries in meeting their obligations under the LBS Protocol and serve as a demonstration for existing and potential parties to the Protocol. It will also contribute to the objectives of the recently adopted Convention for the coastal and marine areas of the North East Pacific.

12. The proposed project activities are wholly consistent with the Contaminant-based Operational Program (OP # 10) of the International Waters Focal Area that makes direct reference to projects that *help demonstrate ways of overcoming barriers to the adoption of best practices that limit contamination of the International Waters environment*. This Operational Program further stresses, *pollution prevention measures* and addresses substances such as *persistent organic pollutants and*

some pesticides that can disrupt human endocrine systems or pose human health threats are candidates for global action.

Rationale and Objective (Alternative)

13. The hydro-geographical data and ocean circulation patterns in the MCB clearly demonstrate the rationale for regional action to address pesticide runoff. The MCB countries have over 3,000 km of coastline on the Caribbean. The vast majority of the land area drains to the MCB rather than to the Pacific Ocean. Drainage to the Caribbean Sea occurs from 96% of the land area of Nicaragua, >70% of Colombia, 46% of Costa Rica and 23% of Panama. As illustrated in Figure 1, Annex A, the MCB sub-region creates a circulation cell of surface currents such that a relatively large portion of the water mass and its associated contaminant load is largely recycled among the four countries rather than being diluted within the general oceanic circulation. This creates the potential for persistent sub-regional transboundary pollution problems. The water mass of the MCB that is eventually stripped away from this cell enters the general oceanic circulation pattern. As such, surface currents will carry contaminants through the area north of the Central American isthmus and up through the Gulf of Mexico. From there the currents enter the Gulf Stream. Reducing pesticide runoff in the MCB could therefore also be expected to make a significant contribution to the standing stock of the more persistent pesticides in the Atlantic Ocean.

14. All of the participating countries are in favour of the rational use of pesticides to improve agricultural output. They recognize, however, that the application of a diversity of alternatives that permits maximum flexibility in pest management and policy is necessary and appropriate to ensure maximum agricultural production with minimum environmental disruption. The GEF intervention proposed in this project will serve to complement and enhance current national activities in the area of agricultural pest management as well as addressing sectors that are not currently being addressed through other interventions.² Through co-operation and partnerships among relevant United Nations agencies, the private sector and other national and regional stakeholders, the project has the overall objective of demonstrating, to other countries of the Wider Caribbean Region, other signatories to the Cartagena Convention and its LBS protocol and beyond, the sustainability of improved pest management practices and their benefits in reducing runoff into the international and common water body of the Caribbean Sea. Improved management, actively applied throughout the “life-cycle” of a pesticides (*i.e.*, manufacture→distribution and sale→application→ultimate fate) will reduce not only the runoff of pesticides to the Caribbean Sea but also improve worker safety and public health and have the added benefit of providing economic savings to farmers, thereby adding sustainability to the project’s objectives.

15. One of the key issues identified in the PDF-B phase is the benefit associated with demonstrations and training in the areas of alternative technologies or BMP. BMP for pesticide use

² As other projects in the region deal with the use of pesticides to control disease vectors (including the UNEP/GEF PDF-B on DDT in Central America executed by PAHO), this project will focus on the agricultural sector while maintaining close co-ordination with other relevant projects and activities.

comprises sustainable alternatives that assure optimum agricultural yield with minimum adverse environmental effects and maximum social and economic benefits. A wide variety of management practices can minimize the extent of water systems contamination from agricultural activities. BMP considers all phases of the production system including pre- and post-production. The key is to identify and select those that are technically efficient and concomitantly reduce the risk of contamination of water systems. BMP may include a reduction in the use of pesticides, but also includes proper pesticide use and selecting the proper kind and amount of a pesticide, applying it properly and storing it safely. On-farm handling of pesticides, which includes transportation, mixing, loading and storage, must also be managed carefully to protect water sources. BMP also includes the application of integrated production and pest management (IPPM). IPPM provides the opportunity to explore and apply a wide range of alternatives to indiscriminate pesticide use, including physical and other non-chemical methods. Above all, IPPM relies on the training of farmers and their understanding of the ecology of the crops and their pests. The project proposes to explore various BMP opportunities and identify and establish within the project and for post-project use and dissemination, those BMPs that are most appropriate for the crops, climate, production methods, and socio-economic conditions of the MCB countries.

16. Selecting and adopting correct tillage practices is also important for reducing pesticide runoff. Various forms of conservation tillage and cultivation for weed control can affect the potential for contamination of water systems. Tillage practices affect soil porosity and surface roughness, which, in turn, affect rates of runoff, evaporation and infiltration. Planting strategies can also influence the types and number of pests and pest control options. For example, planting crops in narrow rows can enhance weed control. Lesser quantities of herbicides may then be needed to control weeds.

17. The proposed project also addresses indiscriminate pesticide use caused by market forces and incentives by creating counterbalancing incentives for rational use and the introduction of non-chemical methods. The Swedish example of reducing pesticide use by 75% following a policy decision also suggests that the recommended dose for pesticide application may often be higher than strictly necessary. Government policies involving tax breaks, subsidies and pesticide market competition will be reviewed and recommendations made to lead towards positive environmental and economic change. Among these incentives to be developed will be the creation of an “eco-friendly” certification programme. The project will explore possibilities and decide on a mechanism for such a certification programme. Models of such programmes already exist in the region, for example the Better Banana Project, coordinated by the Rainforest Alliance, a regional environmental NGO.

18. The environmental and social solution to the problem of pesticide runoff is not something that can be taken “off the shelf”. Accordingly, this GEF intervention will be used to identify, develop and demonstrate the means to reduce pesticide runoff while recognising that pesticides will continue to play a role in agricultural production for years to come. Once successful demonstrations have been developed and implemented in the project, the lessons learned will be employed in other countries and regions to provide for global and regional environmental benefits as well. Examples of information dissemination mechanisms that will be utilised include the GEF IW-LEARN, the Inter-American Water Resources Network (IWRN), opportunities within the CEPNET Clearinghouse Mechanism, and the POPs and GPA Clearinghouse Mechanisms.

19. Consistent with the findings of the PDF-B phase, the alternative approach proposed in this project will build on concerns raised by stakeholders regarding lack of adequate training, information needs, institutional capacity improvements and the requirement to address market forces in a positive way to improve environmental protection. Project outcomes are detailed in the logical framework matrix (Annex B). These include: the provision of necessary incentives, training and education so that farmers and other stakeholders understand the importance of implementing BMPs in pesticide management; availability of information and technology gained from the demonstration projects so that more farmers and other stakeholders will implement these practices and continue to do so in a sustainable manner after project completion; and strengthened institutions in the MCB promoting improved pesticide management.

Project Activities/Components and Expected Results

20. The Regional Workshop held in Panama, 24-25 January, 2001 under the auspices of the PDF-B involving representatives of a wide range of stakeholders (Government agencies, NGOs, International Organizations, private sector, etc.) identified six major elements that must be addressed to reduce pesticide runoff, based on consideration of the root causes of associated problems (see Annex D). The six elements are: (1) Monitoring and Assessment of Impact; (2) Technology Transfer and Alternatives; (3) Education and Training; (4) Development of Incentives; (5) Institutional Strengthening; and (6) Information Management and Dissemination. These six elements are addressed through three Project Components and their activities as shown in Table 1. The hub of the activities will be **demonstration projects that include farmer education programmes** on private agricultural land in each of the countries. Lessons learned from the case studies will provide a basis for post demonstration activities in the areas of institutional changes, training, and coastal monitoring. The Demonstration Projects will have an integrated design, incorporating the six elements described above.

21. **Component 1** will put in place the necessary **Project Coordination and Stakeholder Participation** mechanisms as well as mechanisms to strengthen and maintain the successful networking and coordination that took place within and among project countries during the PDF. A **Project Manager** will be hired and will report to UNEP-CAR/RCU. Following agreements to be established with the National Executing Agencies, a **Project Steering Committee** (PSC --see Terms of Reference in Annex F) will be established to guide the project and set the basis for a regional entity for future coordination and collaboration on reducing pesticide runoff. The PSC will be assisted by advisory panels which will, *inter alia*, **establish monitoring protocols** and design an **appropriate education and training programme**. The Terms of Reference of the advisory panels will be developed by the Project Manager and endorsed by the PSC. *Ad hoc* panels may also be established as appropriate. The PSC will maintain close contact by electronic means and meet several times during the four year term of the project for decision making at critical junctures as well as to provide project oversight and monitoring.

22. **National Co-ordinating Committees** (NCC – See draft Terms of Reference in Annex E) will be established to provide the necessary stakeholder involvement in all aspects of the project at the national level as well as to recommend crops and sites for the demonstration projects to the PSC for approval. Through its review and approval, the PSC will ensure the complementarity of the demonstration project sites between project countries. The National Executing Agency will designate a National Project Manager (NPM). The NPM will co-chair the NCC with a representative of the Ministry of Agriculture and be a member of the PSC. Recommendations from the NCC will be taken to the PSC to ensure that the project objectives for regional and extra-regional demonstration are met. NCCs will meet as necessary during the term of the project and will maintain and establish a permanent means of national co-ordination to reduce pesticide runoff following project completion. NCCs will also be responsible for the technical and administrative oversight of the Demonstration Projects implemented under Component 2.

23. Prior to the initiation of the demonstration projects, major decisions to be taken by the Steering Committee and NCCs will include development and approval of the detailed project workplan, setting **criteria and guidelines for demonstration project activities** (*i.e.*, the selection of the crops taking into consideration the major crops of the region -- coffee, rice, corn, sugar cane, bananas, etc.) and approval of demonstration project activities. Suitable sites for the demonstration projects will be proposed to the PSC by the NCCs in the respective countries, taking into account type of production, extent of pesticide use, environmental risks, crop requirements and ownership and other criteria and guidelines established by the PSC.

24. The demonstration projects will incorporate educational activities for farmers on improved pest management and the sustainability of cleaner production **alternatives** within farm communities, including large scale producers (both regionally and extra-regionally) taking into account economic feasibility and the existence or creation of markets for their resultant agricultural products, which in turn will provide valuable input to Sub component 3.1.1 on incentives. **Component 2** has two sub-components to ensure the successful outcome of the demonstration projects. Sub-component 2.1 will provide the necessary technical tools for the operation of the demonstration projects themselves. **Training** will be provided to each private landowner (and employees as appropriate) for: 1) the proper **application of best management practices**; and 2) an evaluation programme to **monitor effectiveness** of measures employed at the project site. Monitoring and assessment of the environmental and socio-economic conditions of the demonstration sites (BMPs employed, water quality information, pesticides used, prior training, etc.) will be conducted to provide a baseline from which to measure progress within each demonstration project.

25. **Sub component 2.2** is the execution of the **demonstration projects** themselves. Each country will have four demonstration projects, two different crops on two different types of farm - high intensity and low intensity or subsistence.¹ Decisions as to the types of farms most relevant to each country, and

¹ Taking into consideration different levels of pesticide use, agricultural production systems in the MCB may be categorized into subsistence, low intensity and high intensity. Subsistence crops are generally cultivated in marginal areas and pest management strategy is primarily based on mechanical control, traditional cultural practices, multiple associate crops, crop rotation, timing and pest tolerance. Due to sociological and economical circumstances,

most appropriate for extra-regional demonstration, will be reviewed by the NCC and a rationale will be given with its presentation to the PSC for approval (as noted in Component 1). Each demonstration project should have two control sites, and therefore each country will have a total of eight control sites. Each demonstration project and its respective control sites will be comparable in size, crops and other characteristics and in the same watershed. Incentives will be provided to encourage farmers' participation, such as educational study groups, technical support, resources to implement the demonstration (*e.g.*, appropriate pesticides, application equipment, etc.) and recognition. Demonstration projects will run for two years during which follow-up activities under Component 3 will begin to be developed. The project will also facilitate **technical exchange** between the NCCs and demonstration project co-ordinators by funding study tours to other project countries.

26. **Component 3** will implement activities necessary to take advantage of the lessons learned during Component 2 through the **dissemination of information** to enhance replicability of the project objectives. Additionally, this component will **build institutional capacity** through, among other things, institutionalising the positive changes and lessons learned in the participating countries towards sustainably reducing pesticide runoff. **Sub-component 3.1** will establish the means to sustain the advances made toward the project goal of reducing pesticide runoff. Activities will examine the market forces that have led to indiscriminate use of pesticides and **develop incentives** towards rational use of pesticides and other means of reducing pesticide runoff. Activities to develop incentives will include extensive stakeholder and expert consultative meetings to develop and recommend the **appropriate policy and legislative reforms** necessary to allow for the application of incentives. Additionally, Sub-component 3.1 will develop a **crop certification programme** (*i.e.*, “eco-labelling”) for crops produced according to the principles and protocols developed under this project and a marketing campaign for its promotion.

27. Activities of Sub-component 3.1 will also use the lessons learned in the project towards the development of a **‘train-the-trainer’ programme** for the rational use of pesticides. The training course developed and implemented under this sub-component will have utility in the participating countries as well as a broader regional and extra-regional audience. Additionally, sub-component 3.1 will include the establishment of a **regional coastal monitoring programme and database** to monitor pesticides runoff into the coastal environment. Realising the importance of regional monitoring in a region with significant oceanographic inter-connectivity (see Figure 1, Annex A), the participating countries have put significant co-financing into developing such a protocol and programme and are dedicated to its permanent maintenance. These activities will provide the basis for long-term monitoring by academic and oceanographic institutions in the region, including the ISO **certification of laboratories**, to build capacity to conduct the necessary analyses within the MCB.

pesticides are not extensively used in these systems, but when they are they are used with little instruction. In low intensity farms, pesticides are used sporadically during periods of the growing season when pests become a problem. High intensity farms are those with intensive use of pesticides. High intensity farms depend almost exclusively on agrochemicals for crop protection.

28. **Sub-component 3.2** will implement activities to increase **awareness and education** regarding rational pesticide use to minimize runoff as well as to share lessons learned with other countries and regions. Within year one of the project, a project website will be established within the CEPNET sub-programme of CEP with linkages to the Caribbean Clearinghouse node for the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities and with linkages to existing national websites.² Not only will this provide a forum and information source for project participants, but also a means of **information dissemination** for replicability from project commencement. Case studies of the demonstration projects will be built early and updated regularly on the website. Other activities will include a regional workshop where participating countries will present their findings and results to other countries having similar circumstances and the development of awareness and educational materials for the identified stakeholders (including a communications strategy for their use).

² Nicaragua has benefited from previous CEP/CEPNET projects to assist in the development of an environmental website and database. They have already sustained this database and website on their own (utilizing it for the PDF-B of this project). Therefore, such a linkage will build on existing UNEP/CEP sponsored projects.

Table 1 -- Schematic Workplan and Timetable

Components, Sub-Components & Activities	Year	1				2				3				4			
	Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Project Co-ordination																	
1.1 Project Management																	
1.1.1 Hire Project Manager		■															
1.1.2 Establish agreements with National Executing Agencies			■														
1.1.3 Establish National Co-ordination Committees			■	■													
1.1.4 Develop criteria and guidelines for Demonstration Projects			■	■	■												
1.1.5 Develop Demonstration Project workplans				■	■												
1.1.6 Establish Demonstration Project agreements					■												
1.1.7 Monitoring Missions and Evaluations						■					■						■
1.2 Project Steering Committee Meetings																	
1.2.1 Project workplan approval			■														
1.2.2 Approval of Demonstration Project workplans					■												
1.2.3 Project monitoring								■				■					■
1.3 Regional Project Advisory Panels																	
1.3.1 Establish Monitoring and Evaluation Protocols for Demo Proj.			■	■	■												
1.3.2 Develop Education and Training Programme for Demo Proj.			■	■	■												
2. Demonstration Projects																	
2.1 Demo Project Preparation																	
2.1.1 Training – BMPs (IPM, GAP, IWM) for RPR						■	■	■									
2.1.2 Training – Monitoring and Assessment				■	■	■											
2.1.3 Site evaluation/monitoring baseline						■	■	■									
2.2 Demonstration Project Execution								■	■	■	■	■	■	■	■	■	■
3. Institutionalizing Improved Pesticide Management and Strengthening Capacity for RPR																	
3.1 Sustaining Improvements for RPR																	
3.1.1 Legislative/policy changes to promote incentives for RPR												■	■	■	■	■	■
3.1.2 Crop Certification Programme												■	■				
3.1.3 Train-the-Trainer in BMPs														■	■		
3.1.4 Establish Coastal Monitoring Programme													■	■	■	■	■
3.2 Lessons Learned - Education and Information Dissemination																	
3.2.1 Case Studies									■		■		■	■	■	■	■
3.2.2 Regional Workshop													■	■	■	■	■
3.2.3 Develop awareness and education materials													■	■	■	■	■
3.2.4 Website development for RPR					■	■	■	■	■	■	■	■	■	■	■	■	■

Risks and Sustainability

29. Critical assumptions and risks are detailed in the logical framework matrix (Annex B). Some particularly noteworthy risks are:

- (a) Territorial and political disputes between some of the project countries may inhibit co-operation in collecting and sharing data, specifically in trans-boundary watersheds and archipelagic borders should these be chosen for demonstration sites. This risk is mitigated by all countries having shown interest in regional co-operation through this project, all countries being members of CEP and some being Contracting Parties to the Cartagena Convention.
- (b) Extreme weather events are not uncommon in the southwestern Caribbean. Earthquakes and hurricanes can (depending on their magnitude and damage) seriously disrupt project activities as they turn government and public attention to remediation efforts and meeting basic societal needs. Additionally, extreme damage, such as was seen with hurricane Mitch in 1998, can obliterate demonstration project sites. As such natural disasters are unpredictable, planning for this contingency is difficult and will be managed as necessary. Nonetheless, this project will be co-ordinated with another CEP project that proposes to improve coastal watershed management to minimize community and environmental damage caused by hurricanes.
- (c) Political commitment for the project can falter following a change in government. As the project will have an operational level management structure below the level of the political leadership and will be based on broad support from the private and public sectors, the impact of such political change is expected to be minimal.

30. Sustainability of the project initiatives after project completion is subject, in part, to political commitment at the national level and in part to the success of the project itself (*i.e.*, dissemination to the right audiences of a set of demonstrated practices that reduce pesticide runoff whilst maintaining profitability). Because many of the initiatives under this project will assist countries to comply with the LBS Protocol to the Cartagena Convention, in as far as the countries are committed to this regional legal instrument it will ensure some sustainability as compliance with the LBS Protocol will require continued efforts to reduce pesticide runoff. Additionally, UNEP-CAR/RCU, as Secretariat to the Cartagena Convention and its protocols, will continue to provide a regional forum and organizational structure for continued co-operation over the long-term among the project countries and provide wider dissemination of the project results.

31. Specifically, the success of the activities of stakeholder groups during the PDF-B phase of the project has reflected a genuine concern among the regional stakeholders to reduce pesticide runoff. Participating countries are confident that this will continue beyond the life of the project. Additional means of sustainability lie in the development of incentives including the crop certification programme. If successful, these initiatives have the potential to change policies and the market structure to lead toward more sustainable production and greater economic benefits. Long-term sustainability also supposes that

the project is successful in institutionalising, at governmental and corporate levels, the programmes of improved management and changes to corporate practices that will be implemented and tested. Furthermore, the development of a monitoring programme through laboratory certification and the commitment of the countries to maintain a monitoring presence post-project will help to sustain the project goals by providing a continuing information base. It is anticipated that the PSC will form the nucleus of a regional pesticide management committee to assist in the co-ordination of, or liaison with, future efforts in this area thus providing further sustainability to project initiatives. The NCCs are also committed to permanence as national councils. Experience during the PDF indicates that the various stakeholders are dedicated to the success of these regional and national forums.

Stakeholder Participation and Implementation Arrangements

32. The main stakeholders for this project are the farmers, agrochemical distributors, health, agricultural and environmental ministries and agencies, environmental NGOs and other community-based organizations, relevant international organizations, and academic institutions. These stakeholders were represented in the National Committees that participated in the production of National Reports and Action Plans for improved pesticide management under the PDF. These National Reports were discussed and revised accordingly through national workshops each attended by more than sixty participants representative of these stakeholders. Regional actions were presented, discussed, and revised at a regional workshop with the attendance of more than 90 participants representative of these stakeholders. The Project was prepared using the National Reports as the main sources of input.

33. The institutional framework, based on national committees of stakeholders established under the PDF-B, will continue under the Project. As Secretariat to the Cartagena Convention, UNEP-CAR/RCU will be responsible for overall execution of the project and coordination at the regional level. A Project Manager (see draft post description in Annex F) will be hired by UNEP-CAR/RCU for overall management and co-ordination of the project.

34. LACPA is an active agrochemical industry association operating in all participating countries as well as others in the region. LACPA's contributions (in cash and in kind), in addition to its position on the PSC, will be in the area of training. Through the Project Manager, the PSC and the NCCs, LACPA will contribute to those aspects of training that deal with proper handling, application, and disposal of chemical pesticides.

35. At the national level, the executing agencies will be:

- (a) Ministerio del Medio Ambiente y Recursos Naturales (MARENA), Nicaragua;
- (b) Ministerio de Ambiente y Energía (MINAE), Costa Rica; and
- (c) Ministerio de Medio Ambiente, Colombia.

36. Coordination with the UNEP/PAHO project under preparation to phase-out DDT in Mexico and Central America will be achieved through the National Project Managers being members of the Consultative Committees set-up in the context of the DDT project whilst the National Technical

Coordinators for the DDT project will be members of the National Coordinating Committees. At the regional level, the Project Director/Regional Coordinator will co-ordinate between the respective steering committees.

Incremental Costs and Project Financing

37. Table 2 presents an incremental cost table based on the component costs presented in Table 3 and the more detailed analysis contained in Annex A. As noted in that Annex, benefits under this project accrue at the global, regional and national levels. Direct environmental benefits accrue as a consequence of project activities on demonstration project sites. Considerably greater environmental benefits are anticipated to arise through replication of these demonstrations at the national, regional, and global levels.

38. A regional project such as this one carries with it regional transaction costs, such as inter-country co-ordination and associated administrative costs. As such the regional costs of co-ordination will be largely incremental as they would not normally occur outside GEF intervention. The demonstration projects themselves will most likely only provide benefits that are locally significant during the project. The dissemination of the results, materials that are used in their preparation, and lessons learned, will bring regional and global benefits such that much of the associated costs are incremental.

39. Annex A provides more detail regarding the expected benefits at the global/regional and national levels. As noted in Annex A, the marine resources of the MCB are both nationally and regionally important, yet also hold global significance in terms of biodiversity. They are threatened by potential transboundary runoff of pesticides into the Caribbean Sea due to improper pesticide management and application.

40. Table 3 presents the Project budget and component financing. Total Project cost, including the PDF-B expenses, is US\$10.580 million, of which more than half is coming from co-financing. Of particular note, is the significant co-financing being offered by the countries for Project Component 3 (see Table 3). This is due to the importance they have placed on monitoring and assessment. As much of these benefits will be national and regional in nature, the GEF funds being requested are significantly lower, though not zero as clearly there will be global benefits and certainly regional ones. Also of note in the co-financing are funds from the industrial sector towards training in the proper use of pesticides to reduce runoff.

Table 2 Baseline and Incremental Costs and global and domestic environmental benefits.

	BASELINE	ALTERNATE	INCREMENT
GLOBAL ENVIRONMENTAL BENEFITS	2.829	7.414	4.585
PDF-B Phase	0.127	0.422	0.295
Component 1 -- Project Management and Stakeholder Particip.			
Sub-component 1.1 – Project Management	0.195	0.965	0.770
Sub-component 1.2 – Project Steering Committee	0.035	0.095	0.060
Sub-component 1.3 – Project Advisory Panels	0.050	0.145	0.095
Component 2 – Demonstration Projects			
Sub-component 2.1 – Demo Project Preparation	0.260	0.365	0.105
Sub-component 2.2 – Demo Project Execution	1.000	3.500	2.500
Component 3 – Improved Pesticide Mngt and Strength. Capacity			
Sub-component 3.1 – Sustaining Improvements for RPR	0.837	1.247	0.410
Sub-component 3.2 – Lessons Learned	0.325	0.510	0.185
EXECUTING AGENCY OVERHEAD	0	0.165	0.165
DOMESTIC ENVIRONMENTAL BENEFITS	2.923	2.923	0
PDF-B Phase	0	0	0
Component 1 -- Project Management			
Sub-component 1.1 – Project Management	0.100	0.100	0
Sub-component 1.2 – Project Steering Committee	0	0	0
Sub-component 1.3 – Project Advisory Panels	0.060	0.060	0
Component 2 – Demonstration Projects			
Sub-component 2.1 – Demo Project Preparation	0.330	0.330	0
Sub-component 2.2 – Demo Project Execution	0.610	0.610	0
Component 3 – Improved Pesticide Mngt and Strength. Capacity			
Sub-component 3.1 – Sustaining Improvements for RPR	1.618	1.618	0
Sub-component 3.2 – Lessons Learned	0.205	0.205	0

Table 3 Project budget summary and component financing (in million US \$)

PROJECT COMPONENTS	GEF	CO-FINANCING COUNTRIES		CO-FINANCING OTHER		TOTAL
		Cash	In-kind	Cash	In-kind	
Component 1 -- Project Management and Stakeholder Participation	0.925	0.105	0.135	0.075	0.125	1.365
Sub-component 1.1 – Project Management	0.770	0.105	0.135	0.000	0.055	1.065
Sub-component 1.2 – Project Steering Committee	0.060	0.000	0.000	0.000	0.035	0.095
Sub-component 1.3 – Project Advisory Panels	0.095	0.000	0.000	0.075	0.035	0.205
Component 2 -- Demonstration Projects	2.605	0.375	1.650	0.025	0.150	4.805
Sub-component 2.1 – Demo Project Preparation	0.105	0.265	0.150	0.025	0.150	0.695
Sub-component 2.2 – Demo Project Execution	2.500	0.110	1.500	0.000	0.000	4.110
Component 3 – Improved Pesticide Management and Strengthening Capacity	0.595	1.290	1.630	0.000	0.065	3.580
Sub-component 3.1 – Sustaining Improvements for RPR	0.410	0.900	1.555	0.000	0.000	2.865
Sub-component 3.2 – Lessons Learned	0.185	0.390	0.075	0.000	0.065	0.715

Subtotal	4.125	1.770	3.415	0.100	0.340	9.750
EXECUTING AGENCY OVERHEAD	0.165	--	--	--	--	0.165
PDF Total	0.295	0.00	0.125	0.002	0.000	0.422
Grand Total	4.585	1.770	3.540	0.102	0.340	10.337

Monitoring, Evaluation and Dissemination

41. Monitoring progress in the project will be accomplished through the fulfilment of UNEP and GEF requirements for quarterly and half-yearly substantive and financial reports. Specific environmental indicators to measure progress in achieving the objectives of reducing pesticide runoff to the Caribbean Sea, particularly stress reduction and status indicators; will be addressed by the Monitoring Protocol Advisory Panel during the course of the project. The Demonstration Projects will be regularly evaluated at the national level by the NCCs and reported to the PSC. This Panel will meet once a year to assess the projects and make recommendations to the NCCs for improvements, if necessary.

42. Prior to the second project monitoring meeting of the PSC, the UNEP/GEF Co-ordination Office will undertake an external independent evaluation to determine any problems and suggest corrective action. Project management and delivery as well as quality and timeliness of outputs will be evaluated. The PSC will then receive the outcome of the evaluation and plan for any necessary remedial actions. The Project Manager, in co-ordination with the PSC, will also report to the Intergovernmental Meeting of the CEP on progress in the project. The Intergovernmental Meeting will provide feedback on the project and recommendations to ensure project reproducibility and use throughout the region. A final desk evaluation will be undertaken by UNEP according to the UNEP approved Monitoring and Evaluation procedures. Evaluation and overall performance of the project will be undertaken within the framework of the Monitoring and Evaluation Programme of the GEF Secretariat.

43. A communication strategy will be developed by the Project Manager and approved by the PSC. The communication strategy will ensure proper co-ordination with other relevant projects to ensure comparability and avoid duplication. Communication and information dissemination will also include the posting of quarterly progress reports on the CEP website for general information and networking. Stakeholders will provide feedback on monitoring and evaluation through their regular meetings and interaction through the Internet. Training materials and other relevant substantive outputs will be published through the CEP Technical Report series and made available via the CEP website.

ANNEXES

- A Incremental Cost Annex
- B Logframe Matrix
- C STAP Roster Technical Review
- C1 Implementing Agency Response to STAP/Council/Agencies Comments
- D Root Cause Analysis
- E Publications Prepared Under the PDF Block B Grant
- F Draft Terms of Reference for Project Manager and Project Steering Committee
- G Endorsement Letters and pledge of co-financing from LACPA

ANNEX A
INCREMENTAL COSTS AND BENEFITS OF THE PROJECT
REDUCING PESTICIDE RUNOFF TO THE CARIBBEAN SEA

BACKGROUND

The baseline and additional costs associated with achieving domestic and incremental environmental benefits are both pertinent to the identification of GEF Incremental Costs (Table 2). These costs are normally calculated in a national context, but the realm of this project is regional as well as national. Therefore, the benefits arising from this project may be seen at the global, regional, and national scales.

GLOBAL BENEFITS

Assessing the benefits of this GEF project involves the recognition, from a global perspective, of the global environmental importance of the MCB region as well as the potential for transboundary (both global and regional) effects of pesticide runoff from the MCB into the Caribbean Sea. The coastal-marine area of the Caribbean Sea is a critical region that requires special attention with respect to adequate pesticide management. The resources in this area support important biodiversity. The continental shelf supports strategic ecosystems which offer environmental services such as nutrient recycling, biological control, food production, and a source of raw materials. Coastal resources in this area also include diverse economic activities such as sport and commercial fishing and tourism (including eco-tourism). Although there are no comprehensive studies that assess the impacts of pesticides on the coastal environment of the MCB, all participating countries have reported data showing high levels of pesticides in the aquatic environment. Studies in comparable areas such as the Gulf of Mexico have demonstrated the negative transboundary environmental impacts that can result from pesticide contaminants under these conditions.

In regard to coral reef resources in the Caribbean, the region just to the north-west of the MCB (the area through which surface contaminants travel, see Figure 1) includes the Meso-american Barrier Reef – the largest continuous coral reef ecosystem in the world outside the Great Barrier Reef of Australia. The Global Coral Reef Monitoring Network (GCRMN), in its 2000 report on the status of the coral reefs of the world, reports that 21% of the coral reefs in the Caribbean were destroyed prior to 1998 and another 22% loss is expected over the next 10-30 years. A significant portion of this degradation is attributed to human activities including land-based marine pollution. Competition, population growth and poverty are all factors that lead to the deforestation of land for conversion to agricultural land. Not only does the sedimentation of these deforested lands lead to the smothering of aquatic ecosystems, the indiscriminate use of pesticides in these new lands exacerbate the situation as the pesticides reach the marine environment attached to the sediment particles as they are washed into the sea.

Despite the large environmental deterioration that has occurred in the MCB, it still supports the major part of the original natural richness of each country and its protection from further deterioration is vital to the survival of the coastal resources and economies.

Perhaps nothing exemplifies the regional and global importance of the MCB more than an illustration of the ocean surface circulation patterns shown in Figure 1. The water mass that is eventually stripped away from the cell created by the MCB countries enters the general oceanic circulation pattern. As such, surface currents will carry contaminants through the area north of the Central American isthmus and up through the Gulf of Mexico. From there the currents enter the Gulf Stream. Reducing pesticide runoff in the MCB could therefore also be expected to make a significant contribution to the standing stock of the more persistent pesticides in the Atlantic Ocean.

REGIONAL AND NATIONAL (DOMESTIC) BENEFITS

The major national benefits to the project include those that relate to the improvement in the condition of the marine, coastal, and freshwater systems environments under national jurisdiction. National benefits also include those that relate to improvement in farmer's capacity to handle and properly manage the use of pesticides and reduce the adverse environmental impacts relating to the indiscriminate use of pesticides. Regional benefits include those relating to the mitigation of transboundary environmental impacts, such as contamination of strategic ecosystems and loss of biological diversity and other benefits resulting from the adoption of a harmonised regional approach to action, including benefits in terms of economies of scale for training, monitoring and assessment.

Further, national demonstrations that meet the requirements of Annex IV to the LBS Protocol to the Cartagena Convention on Agricultural Non-point Sources, will likely have regional benefits of providing other governments with the tools and impetus to ratify the LBS Protocol, thereby magnifying the benefits of regional harmonisation.

In addition to the global benefits resulting from the protection of the coral reefs mentioned above, regional benefits are gained through the protection of other sensitive ecosystems such as mangroves and sea grass beds, which can be particularly sensitive to pesticides. The nursing areas naturally created by mangroves and seagrass beds support both national and regional fisheries, and it is at the juvenile stage that fish are the most sensitive to adverse effects from contaminants. Many species spawn and spend their juvenile periods in one part of the Caribbean, yet spend their adult lives (when they are

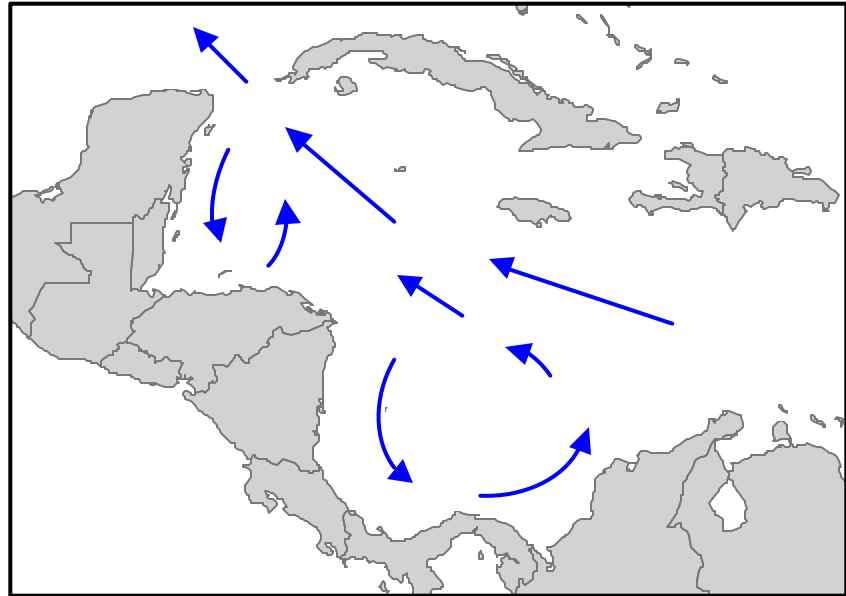


Figure 1. Ocean surface circulation patterns in the Meso-american Caribbean Basin, *adapted from Ogden and satellite imagery*

commercially important in regional and global markets) in the territorial waters of other countries hundreds of miles away.

As noted above, with reference to global benefits, the MCB sub-region creates a circulation cell of surface currents such that a relatively large portion of the water mass, and its associated contaminant load, is largely recycled between the MCB countries rather than diluted in the general oceanic circulation. Although exact measurements of the magnitude of the contaminant load have not been made, experience in other regions strongly suggests regional impacts. Therefore the actions proposed to address marine contamination are predicated on the need to establish harmonised preventative approaches to discharges that will provide future protection of the basin, in line with the internationally accepted *precautionary principle*. The benefit of these actions is that a reduction in pesticide runoff to the Caribbean Sea in any one country, could mean a subsequent reduction in the contaminant load in the coastal zones of the other countries in the region.

BASELINE ACTIONS

The participating countries have initiated actions at the national level to address the problem of pesticide runoff to the Caribbean Sea and have collaborated in, and contributed to, various regional endeavours including the work of the FAO and UNEP. The number of activities within the region demonstrates the recognition by regional stakeholders of the need for a more concerted approach to pesticide management. In most instances however, countries have been unable to devote sufficient internal resources for the development of these necessary programmes and the level of commitment varies widely from country to country.

Important, on-going, regional activities for strengthening programmes of technology transfer, education and training, and institutional strengthening, to which the participating countries contribute directly or indirectly, are also a basis for this project; including the current and proposed work of the Caribbean Environment Programme (in its 2002-2004 workplan and draft Strategy for 2002-2006). It is through the CEP workplan that the Contracting Parties of the Cartagena Convention realise activities to further the goals and objectives of the Convention and its protocols. Activities undertaken or planned by the CEP include a preliminary analysis and identification of BMPs and a methodology to assess quantities of contaminant runoff from urban and agricultural areas from which a regional assessment of non-point source pollutant loadings is planned. A small grants programme is also planned to assist subsistence and low-intensity farms in meeting the capital investments of establishing BMPs to meet the requirements of the LBS Protocol.

The baseline described in Table 2 reflects the current commitment of the countries, both nationally and regionally, to control and diminish the runoff of pesticides to the Caribbean. Recognising the importance of pesticides in modern agricultural practices, demonstration projects based on BMPs will be developed at the national level. Mainly through these demonstrations, the project seeks to assist the countries to realise both increased environmental protection and economic growth through the establishment of programmes to:

- improve training, awareness and education;

- make alternatives more accessible;
- analyse the impacts and risks generated by use of pesticides; and
- develop incentives for continued improvements in pesticide management to reduce runoff.

All three project components include activities that will have benefits at the national, regional and global levels. Component 3, on “sustaining improvements and strengthening country capacity for reducing pesticide runoff” is the component which attracts the greatest baseline contribution from the participating countries, in recognition of the immediate national benefits that can be expected from these activities. It includes the development of national and regional monitoring and data management systems, which will bring regional benefits, but also greatly improve national capacities to deal with the problem of pesticide runoff. Component 2 which is concerned with the preparation and execution of the demonstrations projects also attracts substantial national co-financing, as there are direct benefits to the farmers involved to be expected from these interventions.

INCREMENTAL ACTIONS

This project adds significantly to both the *regional and national baselines* to reduce pesticide runoff through improved management. The level of funding currently available for national and regional co-ordinated actions is insufficient to deal with the environmental problem of runoff of pesticides to the Caribbean Sea. This is due largely to the magnitude of the problem, the lack of available training, and the lack of information on the extent of its impact. Substantial improvements -- those that are necessary to meet current need and to keep up with the ever-growing agricultural activities -- are unlikely to occur in the absence of a GEF intervention.

The potential global and regional benefits that will accrue from this GEF intervention will be substantial, with the potential to address the problem of pesticide runoff comprehensively. The protection of the biological diversity of this ecosystem will stimulate confidence in regional co-operative approaches to adaptive management of marine and coastal catchments. The reproducibility of the project will serve as a case study for the reduction of pesticide runoff to water systems regionally and worldwide. This is based on the following assumptions:

- that the national, regional and global benefits of co-operation developed in the project will be apparent and act as an incentive for sustaining work in the future;
- that even if participating countries were to take unilateral action, due to the issues raised above, they could not ensure the protection of biological diversity in the marine and coastal areas of the Caribbean Sea; and
- that increased awareness of the problem and positive examples for resolving it will help to achieve longer-term sustainability of proposed measures.

ANNEX B
LOGICAL FRAMEWORK MATRIX
REDUCING PESTICIDE RUNOFF TO THE CARIBBEAN SEA

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	CRITICAL ASSUMPTIONS AND RISKS
Overall Objective			
Reduce pesticide runoff to the Caribbean Sea through improved agricultural practices and management.	Full success will only be measurable after completion of the project, as BMPs are applied systematically by an increasing number of farmers in the participating countries. Immediate success will be measured through the results of the sub-regional coastal monitoring programme, relatively to the baseline that will be established at the onset of the project at the demonstration sites; and through the reports of the quantities of pesticides used per ha.		That the impact of, and support for, the project are such that a large number of farmers will adopt BMPs.
Outcomes			
Demonstration that the use of and dependency on pesticides can be rationalised whilst maintaining yield and farmer's profit; dissemination of information and technologies through case studies based on demonstration projects and training programmes.	Voluntary implementation of BMP's by a significantly large group of farmers.	Survey of producers by the Independent Evaluation Panel to quantify degree of utilization of BMP's and change in practices.	That rational decisions are made by farmers regarding pesticide use, and that industry fully collaborates.
A set of BMP's for the major agricultural products of the MCB that are environmentally sound, socially acceptable, and economically feasible and that are transferable to other parts of the WCR and the similar areas of the world.	Set of validated and recommended BMP's.	Endorsement of the BMP's by the PSC.	That experts can agree on a common list of BMP's for the region. The risk of non-agreement is small because of the corpus of experience that already exists on this subject.
Progress towards streamlined laws and regulations that allow for adequate enforcement.	Recommendations implemented by national governments.	Evaluation of steps taken to improve the legal frameworks by the Independent Evaluation Panel.	That governments will revise and improve present legal framework. This is a critical assumption since it requires legislative or executive action. This assumption is likely to be met, based on the consensus apparent during PDF-B phase, and as long as there is adequate public support that is conveyed effectively to the decision-makers.
Elimination of conditions that encourage irrational or indiscriminate use of pesticides.	Recommendations implemented by national governments.	National gazette.	That industry will accept the elimination of market distortions. This is likely since the industry has stated that they are willing to participate and collaborate fully in this programme.

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	CRITICAL ASSUMPTIONS AND RISKS
Improved public awareness of the importance of conserving the marine environment of the Caribbean Sea.	Substantial increase in public awareness and increased political support for the project.	Survey of stakeholders to verify awareness of guidelines, recommendations, and procedures developed by the project. Mention of the project in national and regional fora.	Message will reach the majority of stakeholders in understandable and acceptable terminology. This assumption is likely since there is ample experience in the region in delivering training courses relating to pesticide management and safety.
Identification of high-risk sources of contamination at the Demonstration Project level and assessment of the environmental and human health risks involved.	Information is disseminated to national stakeholders through the NCC.	Periodic reports to PSC.	That a science-based procedure for risk assessment for application common to the region can be developed and applied.
Results			
Validation of BMP's through twelve Demonstration Projects covering six crops on two types of farms	Evaluation of demonstration projects by independent evaluation panel.	Reports to PSC and publication of case studies.	That agreement can be reached on validation methods and criteria.
Incentives policy documents.	Finalised and approved documents.	Endorsement of the incentives policy documents by the NCC and the PSC.	That the regional and national policy documents can be translated into national legislation and other necessary changes to support their implementation.
A group of well-trained experts capable of further training farmers and other stakeholders.	Number of training certificates earned.	Periodic reports to the PSC.	That the trained "trainers" will carry-on providing training. This is a common risk in "train-the-trainer" programmes and will be minimised through project follow-up under the auspices of the UNEP Caribbean Environment Programme.
Educational and public awareness materials.	Set of finalised documents and material.	Presentation of documents and materials to PSC.	That such material is prepared in terms that can be disseminated properly to the diverse audiences involved. This assumption is likely to be met based on experience with similar programmes.
A set of monitoring protocols for the Demonstration Projects, which will serve as standardized protocols for the countries and possible models for the WCR and other regions.	Set of monitoring protocols.	Endorsement of protocols by the PSC.	That countries can agree on common protocols for the region. The risk of non-agreement is small as several institutions are already working on this topic, and there are existing models for protocols and methods.
Geo-referenced databases on pesticide runoff available through the CEPNET clearinghouse mechanism on the Internet.	Databases available in user-friendly format on www.cep.unep.org .	Operational website.	The risk of the Governments not providing the necessary level of support is low, since all the participating countries have identified this as a critical need.
Three certified laboratories, one per participating country.	Certification of laboratories.	Presentation of certification documents to PSC.	That the costs of maintaining certification would not be sustainable. The work accomplished under the PDF-B indicates that there is indeed a need and a market for a certified laboratory in each country.
Components/Activities			

SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	CRITICAL ASSUMPTIONS AND RISKS
Implementation of twelve demonstration projects using BMP's (including site description, baseline monitoring and personnel training); and documentation and dissemination of case studies.	Demonstration Projects are being implemented on the ground.	Field visits by the NPM; periodic reports to PSC and publication of case studies.	Incentives will be provided to ensure that farmers are willing to implement the demonstration projects. The NPMs will monitor project sites regularly to minimise the risk that landowners might not maintain agreed practices.
Identification, publication, and dissemination of successful BMP's applied in the region for the rational use of pesticides, and for reducing pesticide runoff.	Completion of regional and national surveys and validation of successful projects using BMP's.	Web page with validated BMP's.	That experts can define and agree on what constitutes BMP's. This assumption is likely to be met since there have been previous efforts to define BMP's for the region and there are publications available to assist in this task.
Analysis of possible incentives for reducing pesticides runoff, and of required legislative and policy changes for their promotion; establishment of a crop certification programme.	Generic policy document and recommendations for implementation in the three participating countries.	Submission of documents to PSC for approval.	The project will raise awareness on incentives and the impacts of disincentives, but may fail to see changes in national legislation in a four-year period. Ensuring stakeholder participation in the process will help to minimise this risk by developing a cadre of knowledgeable people willing to make positive change. That an eco- certification programme will receive regional/international acceptance.
Train-the-trainer programmes for farmers and agricultural extensionists in best management practices.	Training material and trained personnel.	Record of training participation.	That enough potential instructors are willing to participate in the programme. This assumption is likely to be met as the PDF-B has demonstrated strong commitment from the stakeholders involved.
Development of training and education material (organic crop production and rational pesticide use).	Training material for Demonstration Projects and post-Demonstration Projects.	Submission of training material for approval by NCC and PSC.	None.
Establishment of a coastal monitoring programme and regional certification programme.	Three accredited laboratories; geo-referenced information system of sources of pesticides that drain into the Caribbean Sea; regional agreement on a list of pesticides prioritised according to their risks and sampling plan underway.	Laboratory accreditation certificates; information bank that contains records of pesticide types, volumes used or discharged; presentation to the PSC of the work plans of the Regional and national Committees.	That there is not enough time for laboratories to achieve accreditation. That countries do not follow up on data gathering and dissemination. Minimised by the existence of the CEPNET Clearinghouse operated by CEP, and country commitment to comply with Annex IV of the LBS Protocol.
Website development for RPR.	Website acts as clearinghouse for regional information.	Working website.	Risks are low to none. CEPNET already has an active website that is frequently visited by regional and extra-regional visitors. CEPNET is a permanent sub-programme of UNEP-CAR/RCU and will maintain the website post-project.
Setting-up project management structure: project manager, Project Steering Committee and three National Co-ordination Committees.	Hiring of staff; convening of meetings of PSC and NCC.	Issuance of employment contracts; publication of meeting reports.	That recruitment of the project team can occur within the first three months of the project and that they have the capacity to begin project implementation quickly. The PDF-B has already built technical and administrative capacity within the National Executing Agencies.

ANNEX C – STAP ROSTER REVIEW

STAP ROSTER TECHNICAL REVIEW OF THE PROPOSED GEF-IW PROJECT: “REDUCING PESTICIDE RUNOFF TO THE CARIBBEAN SEA” (COLOMBIA, COSTA RICA, NICARAGUA)

by J. A. Thornton PhD

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Introduction

This review responds to a request from the United Nations Environment Programme (UNEP) to provide a technical review of the proposed International Waters project entitled *Reducing Pesticide Runoff to the Caribbean Sea*.

I note that I am a designated expert on the STAP Roster of Experts with particular experience and knowledge concerning watershed management and land-ocean interactions. I have served as Government Hydrobiologist with the Zimbabwe Government, Chief Limnologist with the South African National Institute for Water Research, Head of Environmental Planning for the City of Cape Town (South Africa), and, most recently, as Principal Environmental Planner with the Southeastern Wisconsin Regional Planning Commission, a position that I hold concurrent with my position as Managing Director of International Environmental Management Services Ltd, a not-for-profit corporation providing environmental education and planning services to governments worldwide. In each of these positions, I have had oversight of projects and programs designed to assess contaminant loads to aquatic ecosystems from land-based activities, and to develop appropriate and affordable mitigation measures to reduce such loads and minimize their impacts of the aquatic environment, both freshwater and marine.

This review is based upon a thorough review of the project document, consisting *inter alia* of the Project Brief (iii + 15 pages), and Annexes A through F, inclusive. Other, relevant documents served as reference sources, including the GEF *Operational Strategy, Agenda 21*, and related materials establishing the necessity and priority of land-based activities to control marine pollution. In this regard, the Global Program of Action for the Protection of the Marine Environment from Land-Based Activities and the United Nations Convention of the Law of the Sea were especially informative and relevant. A knowledge of the UNEP Regional Seas Programme was also useful.

Scope of the Review

This review addresses, *seriatim*, the issues identified in the Terms of Reference for Technical Review of Project Proposals.

Key Issues

Key issue 1. Scientific and technical soundness of the project. Overall, the project appears to be scientifically and technically sound. The approach proposed, which includes an on-going diagnostic and demonstration project-based program, adequately addresses the needs (1) to quantify the nature and intensity of the problem(s) associated with the use and discharge of agricultural chemicals within the environment, and (2) to develop practical mechanisms to minimize such usage and discharge while maintaining sustainable economic levels of agricultural production. The inclusion of consideration of a life cycle approach³ to the management of agrochemicals reflects the state-of-the-art. Inclusion of such an approach within the ambit of an integrated program of nutrient and pest management likewise indicates a comprehensive and technically-sound approach to the goal of reducing pesticide runoff to the Caribbean Sea. The need and desire to better manage nutrient and pesticide applications also is consistent with the actions on the part of the European Community and other importing countries to limit the exposure of their populations to carcinogens and mutagens transmitted through foodstuffs by restricting the importation of produce treated with specific agrochemicals.

While such actions provide powerful incentives to exporting countries to modify their agrochemical usage, it must also be recognized that the agricultural sector is often perceived as being resistant to change. Thus, the use of demonstration projects in each of the participating countries offers an opportunity not only to determine the technical feasibility and economic impact of specific management actions at the scale of the individual farmstead but also contributes to the development of practices that can be seen to have a beneficial impact on reducing agrochemical usage and costs without diminishing crop yields. The latter benefit contributes significantly to the replicability of the techniques identified and proven to be feasible and cost-effective.

Notwithstanding, the conduct of such demonstration projects over one cropping cycle may not be adequate to quantify benefit accrued from the use of modified agrochemical usage. The residual effects of past chemical applications are likely to remain within the fields for some time after agrochemical applications have ceased, extending over several cropping cycles. Further, the timeline for the project hardly allows monitoring of the pre-existing conditions to take place; in other words, it may not be possible to accurately establish the levels of agrochemical loss based upon existing practices. Both of these factors limit the ability of the project to definitively demonstrate the effects and effectiveness of the modified agrochemical usage patterns. Achievement of “good” results on the demonstration plots using integrated nutrient and pest management techniques may simply reflect “carry over” of agrochemicals from preceding chemical applications conducted during the years leading up to the initiation of the project. It would be difficult to establish whether or not the practices employed will be sustainable over the longer term, and whether or not the practices actually reduce agrochemical washoff from the land surface within the timeframe proposed.

³ See Sven-Olof Ryding (1992) *Environmental Management Handbook: The Holistic Approach—from Problems to Strategies*, Lewis Publishers, Boca Raton, 777 pp.

In addition, the omission of the subsistence farmers from the project structure would seem to be a potentially serious omission. As a matter of fact, it has been this reviewer's experience that subsistence farmers have not been immune from the message of agronomists and agricultural extension workers that agrochemicals are beneficial; indeed, the critical aspect of including subsistence agricultural operations in the scope of the project is that subsistence farmers often lack the training to properly use and dispose of agrochemicals even though they are generally aware of their "benefits". This often predisposes subsistence agricultural operations to a greater likelihood of agrochemical washoff than commercial or market garden operations. Indeed, the causal chain analysis included as Annex D suggests that this paradox has been identified; namely, that there is a tension between low product prices and high input costs.

Curiously, the incentive to apply agrochemicals not only stems from the cooperatives and corporations that sell the chemicals, but also from the corporations and cooperatives that buy the produce. Minimum application levels are often specified by the purchasers to ensure a consistent appearance of the crop—in the case of vegetables, especially, the application of excess quantities of nitrogen has been used to ensure a consistent "green-ness" in the product despite the fact that the excess nutrient spurs "weed" growth and the need to apply herbicides! This aspect of the agricultural business has not been identified in the project brief.

Finally, these factors all suggest that it is imperative that agricultural ministries and agricultural extension services be major participants in this project, even though the benefit is likely to accrue to the environment.

Key issue 2. Identification of global environmental benefits and/or drawbacks of the project, and consistency with the goals of the GEF. The proposed project addresses a major cause of environmental stress within the aquatic environment; namely, the utilization of excessive quantities of agrochemicals leading to downstream environmental degradation as such materials are washed off the land surface and into aquatic ecosystems. Many of these ecosystems are either directly or indirectly connected to transboundary watercourses, and many drain to coastal waters that are part of the larger oceanic circulation. In the case of the Caribbean Large Marine Ecosystem (LME), the coastal waters are intimately connected through the Caribbean basin to the North Atlantic circulation, as documented in Annex A. The majority of the territory of the countries within which this project is to be executed drains to the Caribbean basin. Hence, true global benefit is presumed. [In the GEF International Waters context, global benefit is considered as benefit accrued within transboundary water systems—while the locations of the demonstration projects are to be determined as an output of the project, and, hence, are not predetermined, there is every likelihood that the sites will be within watersheds that drain to transboundary waters, and, ultimately in any event, to the Caribbean coastal waters.]

In addition to the presumed direct global benefit, additional benefit accrues to this project through the fact that it addresses one of the most pressing of global concerns: the use of excessive and inappropriate types of agrochemicals, especially those classed as persistent organic pollutants (POPs). Practical demonstrations of effective alternative methods for ensuring consistent levels of agricultural production with reduced quantities of agrochemicals, through integrated nutrient and pest management measures,

will have immense potential for replication throughout the world. The locations of the proposed demonstration projects in the inter-tropics will further recommend the results of the project to other countries, and enhance the potential for replication, and significant global benefit.

It would be important that the results and outputs be widely disseminated. In addition to the dissemination of the project results and outputs through CEPNET, linkages should be established with the Inter-American Water Resources Network (IWRN), the established regional water resources network adopted by the countries of Latin America and the Caribbean (LAC), and the GEF International Waters IW-LEARN network, the global mechanism for disseminating the results of GEF International Waters projects.

The project is wholly consistent with the goals and objectives of OP 10,⁴ contributing to the global effort to address environmental concerns arising from POPs. Many of the agrochemicals identified in the project brief are known to be widely circulated through the hydrologic and global atmospheric circulations. Substances such as malathion have been documented to effect ecosystems thousands of kilometers from their point of origin. Others are known to bioaccumulate. As noted, the proposed project is designed to identify practical and feasible techniques to minimize pesticide applications while maintaining productivity, and to document these techniques for wider dissemination. In this regard, the participation of agricultural ministries and agricultural extension services would be an important element in ensuring the implementation of the project outcomes, even though the outcomes, in the global sense, are environmental in nature.

This project is complementary to a further initiative being formulated within the LAC region to similarly address the use of DDT in the control of public health problem vectors. Through this dual approach, the two projects will enable the GEF to identify and disseminate specific, sectoral-based techniques to reduce the occurrence of POPs in waters draining to the Caribbean Sea. To this end, the participation of the Food and Agriculture Organization of the United Nations (FAO) in this proposed project, and the proposed participation of the Pan-American Health Organization (PAHO) in the complementary DDT abatement project, strongly suggests that mechanisms have been considered to adequately disseminate the projects outputs and results in an appropriate and acceptable manner. Given the GEF aim of incrementally funding projects that contribute to sustainable economic development in a replicable manner, the current proposal and its companion proposal would seem to be well-suited to achieving such an aim.

Key issue 3. Regional context. The participation in this project of two countries from the Central American region, and one country on the South American continent, argue persuasively that adequate and appropriate consideration has been given to the regional context of the project. This is reinforced

⁴ Operational Program 10 includes as indicative activities, *inter alia*, global pollutant projects which are designed to address “toxic pollutants that are persistent in nature...are transported long distances in ocean currents or through the atmosphere...[and] are associated with certain industrial sectors or processes...[that] cannot be cleaned up through regional action because this would place the countries or enterprises at an economic disadvantage in world markets...[Such are] candidates for global action in global pollutant project.” Agrochemicals have been documented as fitting this description.

through the fact that the three participating countries have substantial land areas that drain to a common and shared LME, that is a major part of the North Atlantic circulation. The participation of these three countries also provides a range of agricultural settings wherein a number of best management practices (BMPs) can be developed and field tested under a variety of environmental conditions and with a variety of crops and cropping patterns, all typical of the LAC region. Thus, despite the lack of a requirement that the contaminant-based operational program include a multicountry collaborative process, this proposed project includes an high degree of regional cooperation and collaboration. Especially important elements of this regional approach include an emphasis on agricultural products typical and representative of the region as a whole, the concept of an “eco-friendly” certification program (which, presumably, will be run regionally rather than nationally?), and the proposal to develop a regionally-based laboratory certification program to ensure acceptable and consistent standards in monitoring and quantifying agrochemical contamination within the Caribbean LME. The emphasis, too, on the dissemination of project outputs and results using accepted regional information dissemination networks—CEPNET, including, per earlier comments, the IWRN and IW-LEARN mechanisms—reinforces the presumed and proposed regional approach to the conduct of this project.

While the proposal clearly indicates an intent to disseminate information and results on a regional basis, it is somewhat less clear in terms of the mechanisms envisioned for regional laboratory certification, certification of eco-friendliness, and farmer training. While the UNEP Regional Seas Programme and related legal instruments pertaining to the Caribbean basin could form the basis for a regional laboratory certification program (and subsequent monitoring program to be conducted using these certified laboratories), farmer training and eco-friendly certification might be better effected at the country level using existing agricultural extension workers and regulatory mechanisms. Should this be the case, the project will undoubtedly contribute to the regional knowledge base necessary for such extension workers and certification programs to be effective and accepted. Especially with respect to the eco-friendly certification program, it would seem important that such a program have worldwide recognition, particularly given the standards and “truth-in-labeling” laws that exist in many countries (such as the EC) importing, or potentially importing, produce from the Caribbean basin. Therefore, and perhaps despite the fact that these concepts are intended to be developed further as project outputs and results, it would seem reasonable that the vision with respect to these elements be articulated in the project document, especially with respect to their regional and/or country level mode of implementation.

Notwithstanding the foregoing request for clarification, the project clearly meets and exceeds GEF requirements for a regional approach to global problems relating to POPs and other agrochemicals.

Key issue 4. Replicability. The implementation of demonstration projects as a key feature of this project clearly contributes to the potential for replication of beneficial practices and techniques. Further, the inclusion of mechanisms for disseminating information and results achieved fosters replication of effective and successful measures throughout the region, and especially within the participating countries. Discussions amongst GEF International Waters project managers at the recently concluded Fourth Inter-American Dialogue of Water Management (Dialogue IV) clearly identified GEF International Waters projects as the primary means by which basin-scale management practices were being developed and implemented through the LAC region. A key concern amongst these managers was the

need for mechanisms to share experiences and lessons learned across project boundaries. This concern led to their endorsement of a complementary medium-sized project designed to develop and implement information sharing mechanisms at the regional scale—specifically the IWRN, as one element of the region’s participation within the global IW-LEARN initiative. This endorsement underlined the importance of information sharing and dissemination between projects, a fact that is adequately and clearly identified within the project brief for this project.

In addition, Dialogue IV embraced the concept of project twinning as one mechanism to enhance exchange of knowledge and experience. As recognized within the project brief for this project, there is considerable complementarity between this project and the project currently being developed to reduce DDT dependency within the LAC region. These projects would make ideal candidates for twinning, as this concept is envisioned and articulated within the Declaration of Foz do Iguacu: “international cooperation and meaningful exchanges, between multilateral organizations, the public sector and civil society, are key instruments for supporting the practice of comprehensive water planning and management.” Consequently, as both of these project develop, it is critical that the linkages and communication between the projects be open and frequent, as has been indicated in the project brief for this project. Such communication will enhance the replicability of the project outputs and results of both projects, and significantly contribute to the coordinated and comprehensive management of POPs in the Caribbean basin.

Key issue 5. Sustainability of the project. Annex D to the project brief identifies two key facets that will ‘make or break’ this project with respect to its sustainability. Of these, the external influences inherent in the marketplace—noted above in terms of both the demands for consistency in produce grown and the demands of the countries importing the produce for pesticide-free products—are likely to provide an irresistible driving force for industrial farms to adopt integrated nutrient and pest management programs that depend less upon agrochemicals and more on alternative methods likely to be developed as an output of this project. The concern that remains clearly relates to produce grown for home consumption and crops grown by subsistence level farmers, where the second of the key factors has paramount import. Annex D states that, “in most cases,...it is simply a lack of adequate resources for monitoring compliance with [existing] regulations and enforcement of [known] safety precautions, for both workers and the environment, that are the cause of inadequate protection” (emphasis added). While this project can address issues of training, and encourage voluntary compliance through certification programs, both of which have immense impact of the sustainability of alternative nutrient and pest management practices, it does not address the issue of the need for adequate finance from domestic sources to implement and enforce regulations and safety precautions. The project brief acknowledges a number of incentives for the participating countries to provide such resources, including their participation as signatories to the Cartagena Convention and its protocols, but does not directly address the issue of lack of adequate resources, *per se*. Indeed, encumbrances such as extreme climatic events and changes in government, noted in the project brief, identify additional demands on country-level finances and priorities that mitigate against sustainability. Notwithstanding, however, the project does propose to address one key element in the process of country’s devoting adequate resources to enforcement and environmental safety, and, that is, the availability of information and the development of a trained cadre of individuals with the knowledge and ability to train agricultural

operators and inculcate a culture of integrated nutrient and pest management at the level of the individual farmstead. To this end, it has been noted that a close connection between the project and the agricultural ministries and agricultural extension services is essential to the sustainability of this project. Articulation and inclusion of this need as an important element of Component 1, Project Coordination and Stakeholder Participation, is strongly recommended in the interests of sustainability.

Key issue 6. Targeted Research Projects. Targeted technical demonstration and capacity building projects are key features envisioned within the GEF International Waters Contaminant-based Operational Program. These activities are clearly included as major elements of this proposed project, which is focused on the use of demonstration projects as the means of determining and identifying appropriate and applicable management measures to minimize agrochemical contamination of the aquatic environment. In addition, the provision within the project brief for development and implementation of the means to replicate successful management practices completes the GEF vision of disseminating results and outputs within the LAC region and elsewhere. Notwithstanding, the relatively short timeframe within which the project is proposed to be executed, and the known “lag time” that is generally associated with environmental management projects, potentially diminishes the scientific validity of the project as a research effort. As noted above, the project brief suggests that the demonstration projects will be carried out over only one, annual cropping cycle, which is not an adequate period within which to establish pre-existing conditions and responses to climatic events (a known risk in the region). Given external considerations, not the least of which is the requirement of the GEF that results be obtained over relatively confined timeframes, it may not be possible to accommodate this concern. On the other hand, though, given that the interventions that are funded in part by the GEF strive for sustainability, the continuation of the successful interventions beyond the project period may continue to provide the necessary information required to address this concern in a scientifically-valid manner. For this reason, it is most important that the measures identified by internalized within the agricultural ministries and agricultural extension services such that they continue to be implemented over the longer period. Likewise, it is equally important that the demonstration projects continue to be monitored, and the results reported using the information dissemination mechanisms previously identified, beyond the project period. Such continuity is totally consistent with the catalytic nature of UNEP and the GEF, and an essential element to the sustainability of the project. Capacity building and trainer training, envisioned in the project brief, thus become the basic building blocks upon which this project will succeed or fail, both from the point of view of its sustainability and from its scientific and technical integrity.

Secondary Issues

Secondary issue 1. Linkage to other focal areas. This project is formulated as an International Waters project under OP 10 of the GEF *Operational Strategy*. No specific cross-cutting areas are identified, although the project clearly has linkages to the cross-cutting area of land degradation,⁵ and ,

⁵ Note: As of 2001, both POPs and land degradation have been added to the GEF family of focal areas as a consequence of the adoption of international conventions within these areas of emphasis. Thus, this project has clear linkages to both of these focal areas even though its primary concern is the protection of the marine

potentially, to the protection of aquatic biodiversity. Expansion of the agricultural frontier and inappropriate use of agrochemicals is a common concern throughout Latin America. By developing alternative measures and management practices to address the use of agrochemicals in the LAC region, this project benefits land management generally, and contributes to the protection of aquatic biota commonly impacted by the discharge of such chemicals into the aquatic environment.

Secondary issue 2. Linkages to other proposals. The project recognizes the complementarities between the management of agrochemicals and the management of other biocides within the environment. Specific linkages with the proposed project on the environmental health implications of the use of DDT in Central America are proposed and identified in the project brief. In addition, the project makes use of the IWRN and CEPNET networks which complement the IW-LEARN initiative of the GEF International Waters program. Such overt linkages provide an high degree of sustainability and connectivity to this project, and contribute to the likelihood that lessons learned can and will be transferred beyond the project boundaries to other, similar situations and locations within the LAC region and beyond. The project embodies the principles invoked by the Declaration of Foz do Iguacu with respect to water management in the Americas.

Secondary issue 3. Other beneficial or damaging environmental effects. The project has no known or obvious damaging environmental impacts associated with the activities proposed to be executed. The beneficial impacts of the project have been fully articulated above, and include the identification of alternative methods for achieving high quality agricultural produce with minimal levels of agrochemicals, the provision of trained staff and agricultural workers needed to enforce and enhance existing environment and human health protection regulations and implement the alternative methods of production, and the dissemination of successful management measures. All of these benefits accrue not only within the project area, but, as a result of their wider dissemination using the electronic and other media provided, also to the wider Caribbean basin and beyond.

Secondary issue 4. Degree of involvement of stakeholders in the project. Component 1 of the project is geared toward the involvement of stakeholders, specifically those private landowners and farmers that participate in the demonstration projects as well as the wider public who can be involved in the project through the IWRN, CEPNET and other media. As previously noted, there is a pressing need to include the agricultural ministries and agricultural extension services in the execution and implementation of the project activities. Such involvement is in addition to the current level of involvement of the environment ministries, and is critical to the sustainability of the project and its expansion into areas not specifically involved in the demonstration projects.

Secondary issue 5. Capacity building aspects. Component 3 is aimed in part at the dissemination of information on the successful measures to reduce the use and dependency of agricultural operators on agrochemicals, specifically those associated with POPs that have the potential to negatively impact aquatic ecosystems and human health. In part, this Component will involve the training of agricultural extension staff who will, in turn, train others in the use, application and implementation of alternative pest

environment.

management practices and the application of integrated nutrient and pest management techniques. In addition, Component 3, in part, seeks to encourage dissemination of lessons learned with respect to alternative pest management practices and best practices for integrated nutrient and pest management. This element should be conducted in liaison with complementary GEF International Waters initiatives, including the best practices data base being compiled by UNEP and the IW-LEARN initiatives being executed by the United Nations Development Programme (UNDP). These efforts will enable wider dissemination of knowledge of practices that have positive effects in reducing washoff of pesticides into the aquatic environment. Similarly, cross-posting such information for dissemination through the IWRN network will encourage and facilitate application of appropriate best practices throughout the LAC region. Such knowledge is an essential element in building capacity and strengthening institutions in the region. Again, however, efforts should be continued to involve the agricultural ministries and agricultural extension services, who form the first line of contact with individual landowners and farmers, in the dissemination of information and data on appropriate best practices.

In addition to the dissemination of knowledge and information, the development of standard methods for analysis and impact assessment will benefit institutions and staff throughout the region. In this regard, Component 3 also contains work elements aimed at establishing a certification process for laboratories engaged in the analysis and assessment of pesticide contamination in the aquatic environment. Knowledge of such standards and the confidence that certification engenders in the data generated by participating laboratories is another important element in reinforcing institutional capacity within the region. Maintaining such standards and certification requires trained individuals, actively and conscientiously applying their knowledge and skills for the public good. This can only benefit everyone in the LAC region.

Secondary issue 6. Innovativeness. Development of appropriate management practices governing the use of agrochemicals within the inter-tropics, within the context of integrated nutrient and pest management programs and with recognition of the life cycle of specific biocides, demonstrates a strong desire that the results and outputs of this project reflect the state-of-the-art with respect to agrochemicals. By selecting demonstration sites that span the range of likely conditions and crops within the three participating countries, the project team has clearly attempted to develop pest management programs that will be accepted by the agricultural producers, their customers, and, ultimately, their end users. By recognizing the linkages created through the landscape upon which agricultural operations are conducted with the aquatic environment, the project team is clearly applying state-of-the-art watershed-based management concepts to resolving a problem that is of global concern. For these reasons, the proposed project undoubtedly demonstrates an high degree of innovativeness in its approach and in its anticipated results.

General Conclusion and Recommendations

Overall, it is the conclusion of this reviewer that the proposed project, with the goal of “Reducing Pesticide Runoff to the Caribbean Sea”, is wholly consistent with the GEF International Waters operational program, its broader philosophy, and funding criteria. Consequently, this project is recommended for funding.

In implementing this project, the GEF Implementing Agency is enjoined to give specific attention to:

- inclusion of agricultural ministries and agricultural extension services in the execution of the demonstration projects,
- continuation of the demonstration projects beyond the project period so as to better evaluate the longer term performance of selected best practices determined to be feasible and practicable,
- recognition of the broader market forces (including both external standards and legal requirements, and consumer demands) affecting the use of agrochemicals,
- consideration of the linkages between this project and related contaminant-based projects within the LAC region, including (specifically) the proposed initiative to eliminate the use of DDT for public health purposes, and
- dissemination of results and outputs utilizing a variety of media but especially utilizing the regional IWRN and CEPNET networks and the global IW-LEARN network.

**ANNEX C1 – IMPLEMENTING AGENCY RESPONSE TO STAP/COUNCIL/
IMPLEMENTING AGENCIES COMMENTS**

Response to STAP Review

In general, the comments of the STAP ROSTER reviewer Dr. J. A. Thornton are supportive of this project, “Reducing Pesticide Runoff to the Caribbean Sea (Colombia, Costa Rica, Nicaragua)”. The reviewer states that “the project appears to be scientifically and technically sound”, and endorses the approach based on demonstration projects which will “enhance the potential for replication and significant global benefits” and “undoubtedly demonstrates an high degree of innovativeness in its approach and in its anticipated results”. Notwithstanding, Dr. Thornton has indicated some issues that he believes require further consideration in the formulation of this project. The following paragraphs provide a detailed response to the principal queries raised. No further comment is provided to those issues identified as being adequately addressed by the Project Brief.

Key Issues

Key issue 1. Scientific and technical soundness of the project.

The reviewer brings up concerns about the time line for the demonstration projects. Specifically, conduct of the demonstration projects over only one cropping cycle, possible “carryover” effects of past agrochemical management schemes, and the lack of monitoring of pre-existing conditions at each site were mentioned as hindrances to the success (or measure of success) of the overall Project. These points are indeed critical and have been carefully considered in the planning of the Demonstration Projects. As outlined in the Timetable (P. 10 of the Brief), the demonstration projects will be studied for two years. During the period prior to beginning the actual Demonstration Projects, monitoring and assessment of sites, as well as training for the stakeholders involved with the demonstration projects, will be conducted during one year. Any pre-existing conditions will be clearly documented so as not to prejudice the results obtained from the succeeding two years of study at the sites. In addition to each demonstration project, there will be two control sites in the same watershed. These sites will also add to the information concerning pre-existing conditions and possible carryover effects. As data are collected and results are published, additional funding opportunities will be sought to allow for the continuation of the Demonstration Projects.

The reviewer also expresses concern about the omission of subsistence farmers from the project structure citing that “subsistence farmers often lack the training to properly use and dispose of agrochemicals even though they are generally aware of their ‘benefits’. This often predisposes subsistence agricultural operations to a greater likelihood of agrochemical washoff than commercial or market garden operations”. Work undertaken in the framework of the PDF-B (cf regional report) established that it was at the high and low intensity farms that the majority of the agrochemicals were used, and that due to sociological and economical circumstances, pesticides were not extensively used in subsistence farming systems. It was recognised, however, that if agrochemicals were used, they were used with little instruction. Therefore, identification and possible inclusion (at the discretion of each

National Coordinating Committee) of subsistence farmers in the Demonstration Projects is an option (Paragraph 25, Sub component 2.2 of the Project Brief).

The reviewer includes in his discussion mention of agri-business aspects of agrochemical use. Concerns are expressed that some aspects are not sufficiently identified in the Project Brief, particularly the drive from those who purchase the agricultural products for a consistent appearance of the crop. In the Root Cause Analysis (Annex D), four major causes contributing to pesticide runoff into the Caribbean Sea were identified: cultural/social, policies and institutional structures, market, and technical. The market analysis clearly identified this aspect of the problem. Low agricultural product prices coupled with high quality standards demanded by the consumers tend to maintain the producer in a situation of ever increasing pesticide use, where costs and benefits are not analysed properly and the costs of environmental degradation not internalised. As part of the analysis of the Demonstration Projects, the agri-business aspects of agrochemical use will be explored and documented as part of the “incentives” element of the project.

The final concern the reviewer identifies with respect to this first issue is that of participation by the agricultural ministries from each of participating countries. Indeed, as outlined in the National Reports and as summarized in the Regional Report, there are three ministries in each country involved in policies and regulations on pesticide registration and control of environmental pollution (Table 2, Regional Report). In each case, this includes the Ministry of Agriculture, the Ministry of Environment, and the Ministry of Health. UNEP agrees with the recommendation and will pay particular attention to the full participation of the agricultural sector to the project. Formally, the concern of the reviewer is addressed through the Terms of Reference for the National Coordinating Committee (NCC - Annex F to the Brief) allowing for the participation of each of these ministries. Moreover, the same Terms of Reference call for a representative of the ministry of agriculture to co-chair the NCC.

Key issue 2. Identification of global environmental benefits and/or drawbacks of the project, and consistency with the goals of the GEF.

The reviewer notes, “it would be important that the results and outputs be widely disseminated” and mentions such networks as IWRN and IW-LEARN as possible mechanisms for dissemination. As pointed out in paragraph 18 of the Brief, “Once successful demonstrations have been developed and implemented in the project, the lessons learned will be employed in other countries and regions to provide for global and regional environmental benefits as well”. Paragraph 18 of the Project Brief specifically mentions IW-LEARN and IWRN as mechanisms for information dissemination.

Key issue 3. Regional context.

The reviewer requests a more detailed development of the Project’s vision with respect to the regional and or country mode of implementation of the aspects of laboratory certification, certification of eco-friendliness and farmer training. As stated in paragraph 27 of the Project Brief, and as suggested by the reviewer, laboratory certification will be at the regional level, following the guidelines of the International Standards Organisation (ISO). With respect to the eco-friendly certification, it is indeed important, as stated by the reviewer, that such a program have worldwide recognition, and the member countries will

look to regional examples of established programmes to decide on what mechanisms should be used in the present project (see paragraph 17, Project Brief).

Key Issue 5. Sustainability of the project.

The reviewer notes that “a close connection between the project and the agricultural ministries and agricultural extension services is essential to the sustainability of this project”. He states that it is essential that this be articulated and included in Component 1 of the Project. This is an important point and indeed has been included in the Project Brief. As outlined in Component 1, paragraph 22 (Project Brief) a representative from the Ministry of Agriculture from each of the member countries will co-chair their respective NCC (see also Annex F, Draft Terms of Reference NCC). Also important is that the participating countries do not have agricultural extension services *per se*, but universities, NGOs and private companies that carry similar activities. Stakeholders from these various groups will also be invited to actively participate in the NCC.

Key Issue 6. Targeted Research Projects.

The reviewer expresses valid concerns about the time line for the demonstration projects, though perhaps misinterpreting the Project Brief. The demonstration projects will in fact be studied for two years (see timetable of Brief and see also, *Key Issue 1* in this Response to STAP Review), and not only one year as noted by the reviewer. In addition to the two years of demonstration projects implementation, there will be a period prior to this in which the pre-existing conditions will be monitored to establish a baseline. Nonetheless, UNEP realises that even this longer time frame may be too short a time frame to address the concern of the “lag time” associated with the contamination of aquatic environments by agrochemicals. Participating countries, however, are confident that project activities will continue beyond the life of the project (see paragraph 31, Project Brief). The goal is that the demonstration projects continue to be monitored, and the results reported beyond the Project period, using the information dissemination mechanisms previously identified.

Secondary Issues

In the *Secondary Issue 4* (Degree of involvement of stakeholders in the project) and *Secondary Issue 5* (Capacity building aspects), the reviewer reiterates his concerns about the groups of stakeholders involved in the Project, particularly those from the agricultural ministries and those who work in agricultural extension type jobs. These are answered in the previous discussion in this Response to the STAP Review (*Key Issues 1, 2 and 5*).

Response to Implementing Agencies Comments

Comments were received from the World Bank. These comments are supportive, and only lament the lack of inclusion of some Caribbean Island States that could benefit from such a program. Indeed these Island States should be some of the first candidates for replication. This will be facilitated by these States also being member of the Caribbean Environmental Program.

ANNEX D

ROOT CAUSE ANALYSIS : CAUSES OF PESTICIDE RUNOFF TO THE CARIBBEAN SEA

BACKGROUND

A regional overview of the problems associated with pesticide runoff was obtained from four national⁶ reports and synthesized into a regional report on reducing pesticide runoff through improved management. Each national report reviewed the current state of pesticide management from cradle to grave (i.e., from manufacture or import to sale, application and ultimate fate). As a result of these evaluations, the national reports, whose development was overseen by committees including a wide range of stakeholders, were able to identify the major issues and their causes, as well as to identify some solutions to the problems.

Increased agricultural activity in recent years in the countries of the Southwestern Caribbean Region, due to growing populations and competition for a share of global markets, has heightened concern about possible contamination of soils, groundwater and surface water. Significant quantities of pesticides are mobilized from agricultural land uses and transported through watercourses into receiving coastal waters. The capacity of coastal zones and marginal seas to assimilate wastes is limited. The information available in the Gulf of Mexico on the effects of high levels of contaminants in sediments and marine organisms demonstrates the transboundary/regional character of marine environmental problems related to the use of pesticides in comparable settings.

ROOT CAUSES OF IMPROPER PESTICIDE MANAGEMENT LEADING TO PESTICIDE RUNOFF IN THE CARIBBEAN SEA

In the analysis of the problem of pesticide runoff into the Caribbean Sea in the National Reports under the PDF-B, a series of root causes were identified, of which the most important were:

- cultural and social aspects;
- policies and institutional structures;
- markets; and
- availability of technical information.

Figure 1 of this annex (below) graphically illustrates the underlying root causes of each of these major causes and identifies their interlinkages and consequential effects and measurable symptoms.

⁶ The four countries of the Mesoamerican Caribbean Basin participated to PDF-B activities, but Panama has opted not to participate in the full project due to other national priorities competing for co-financing resources.

CULTURAL/SOCIAL

A number of issues were identified related to cultural and social factors prevailing in the countries. Foremost was the lack of awareness on the part of most farmers of the gravity of the problem and of the possibility of alternatives to the agricultural practices that they currently employ. Second is that when farmers have not been properly trained in the use of agricultural pesticides, they are often unaware of the dangers, both to themselves, and to the environment. Finally, there is a fewer number of farmers who may be aware of the correct procedures or existence of alternatives, but through negligence or apathy choose not to apply them. All of these situations are a direct result of a lack of education and training. Without proper knowledge in the use of agro-chemicals, the actions of farmers in these countries will continue to be a major cause of the contamination of the environment.

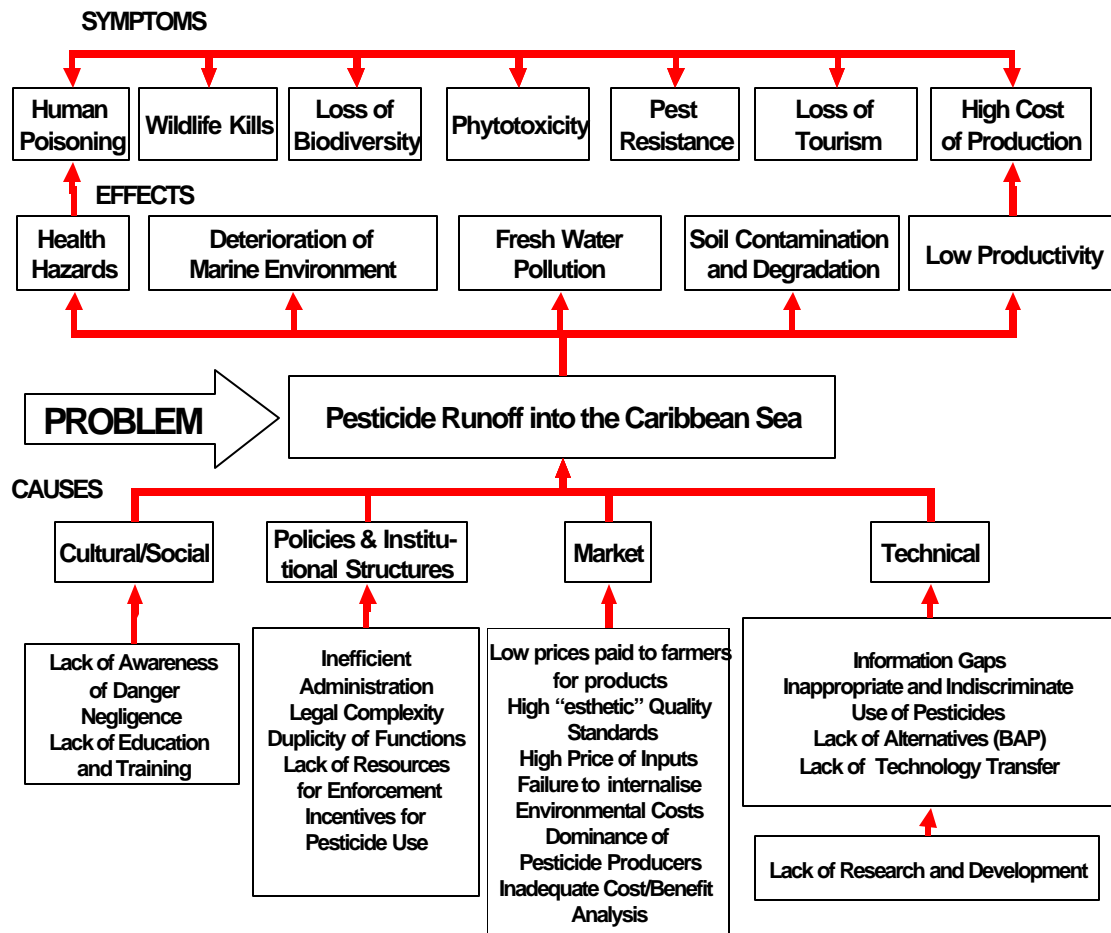
POLICIES AND INSTITUTIONAL STRUCTURES

The policies and institutional structures of the three countries also have a negative impact on the environment. Often, inefficient administrative bodies are in charge of implementing the laws that govern pesticide use and environmental protection; or there may be various institutions with similar functions, but with conflicting regulations or requirements. The laws themselves can be very complex and difficult to operationalise. In most cases, however, it is simply a lack of adequate resources for monitoring compliance with regulations and enforcement of safety precautions, for both workers and the environment that are the cause of inadequate protection.

MARKETS

The structure of markets are also an important root cause to this environmental problem, mainly due to the influence of the pesticide producers, both in the countries of the region and in those countries who import pesticides to the region. The value of the agricultural products paid to the producer is often very low, even though the required quality standards are very high. The chemical companies sell their products at high prices, and the producer must use large amounts of inputs, both pesticides and fertilizers, to maintain high quality standards and to produce higher yields to compensate for low prices. This tends to maintain the producer in a situation of ever increasing pesticide use, where costs and benefits are never analysed properly and the costs of environmental degradation never internalised.

ROOT CAUSE ANALYSIS PESTICIDE RUNOFF TO THE CARIBBEAN SEA



TECHNOLOGY AVAILABILITY AND INFORMATION

The fourth root cause of pesticide runoff and environmental pollution of the Caribbean Sea identified in the National Reports is the lack of technology transfer. Frequently the most current technological information is not available to the farmers and other stakeholders in the countries of the region. When farmers do not have information concerning the correct pesticide application procedures, the result is inappropriate and indiscriminate pesticide use. Furthermore, the lack of information concerning safety requirements for handling of pesticides has led to the incorrect use of personal protection equipment. Many times equipment is not used because workers find it hot and cumbersome, thus greatly increasing their health risks.⁷ Another issue is the lack of information concerning the BMPs that could be

⁷ Though this project is primarily concerned with environmental protection, this point is important as it indicates a

employed. Many times alternatives are not considered because there is a lack of information to simply identify which BMPs are appropriate.

lack of knowledge or consideration for one's own personal health, and exemplifies the challenges for awareness and education if one is to ask these same workers to concern themselves with the environment. The project which is focused on the environment will have the added benefit of increased personal protection and safety of agricultural workers.

ANNEX E
PUBLICATIONS PREPARED UNDER THE PDF BLOCK B GRANT

The following PDF-B outputs used as background for this brief can be found at:

www.cep.unep.org/pubs/meetingreports/GEF-Pesticides/GEF%20Pesticides.htm

- *Vertimiento de Plaguicidas en el Mar Caribe de La República de Panamá*, Autoridad Marítima de Panamá, Dirección General de Marina Mercante, Departamento de Prevención y Control de la Contaminación, pp. 151, Panamá, 17 de Noviembre de 2000. *(Spanish only, Executive Summary in English)*
- *Informe Nacional sobre el Uso y Manejo de Plaguicidas en Colombia, Tendiente a Identificar y Proponer Alternativas para Reducir el Escurrimiento de Plaguicidas al Mar Caribe*, Ministerio del Medio Ambiente, Dirección General Ambiental Sectorial, Proyecto Pnuma/UCR/CAR-Global Environment Facility, Juan Pablo Bonilla Arboleda, *et. al.*, pp. 155, Bogotá, noviembre 24 de 2000. *(Spanish only, Executive Summary in English)*
- *Reduccion del Escurrimiento de Plaguicidas al Mar Caribe, Informe Nacional: Costa Rica*, Ministerio de Ambiente y Energía (MINAE), Escuela Agrícola de La Región del Trópico Húmedo (EARTH), pp. 94, Diciembre 2000. *(Spanish only, Executive Summary in English)*
- *Proyecto de Reduccion del Escurrimiento de Plaguicidas en el Mar Caribe, Informe Nacional de Nicaragua*, Ministerio del Ambiente y Los Recursos Naturales (Dirección General de Control Ambiental Dirección de Vigilancia y Control Ambiental), Programa de Naciones Unidas Para el Medio Ambiente, Mario A. Vaughan, *et. al.*, Managua, Nicaragua, noviembre de 2000. *(Spanish only, Executive Summary in English)*
- *Reducing Pesticide Run-off to the Caribbean Sea*, Regional Report, Global Environment Facility, UNEP-CAR-RCU, EARTH College, pp. 99, February 2001. *(Spanish and English)*

ANNEX F
DRAFT TERMS OF REFERENCE FOR PROJECT STEERING COMMITTEE (PSC), NATIONAL CO-ORDINATING COMMITTEE (NCC) AND PROJECT MANAGER: “REDUCING PESTICIDE RUNOFF TO THE CARIBBEAN SEA”
(TO BE FINALISED DURING APPRAISAL PHASE)

PROJECT STEERING COMMITTEE

The PSC will serve to guide the overall implementation of the project. The PSC will serve as the primary decision making body to which the Project Manager and the National Co-ordinating Committees will report.

Specifically, the PSC will ensure that project goals and appropriate GEF procedures for reporting are met. It will ensure complementarity across the three project countries and avoid duplication of efforts that could lead to wasteful expenditure.

1. Membership of the Project Steering Committee:

- 1.1 The members of the PSC will be the participating countries, the GEF Implementing Agency (UNEP), other donors to the project and regionally recognised organisations agreed to by the countries. Specifically:
 - Two representatives of each participating country will participate in the Steering Committee. One will be the National Project Manager and accompanied by an additional technical person. Additional advisors (up to 2) can also advise the country representatives at their own expense;
 - Invitations to participate as members in the PSC will be extended to the following organisations: FAO, LACPA, IICA, EARTH College, and two NGOs (one representing agricultural producers and one an environmental NGO) active at the regional level.
- 1.2 The Chairman and Vice-chairman of the PSC will be elected from the three participating countries and will rotate on an annual basis. The Chairman will preside over the meetings and be the key contact between the PSC and CAR/RCU.
- 1.3 The PSC may opt to invite additional experts (observers/advisors) as necessary to any meeting of the Committee.

2. Secretariat

- 2.1 CAR/RCU will act as secretariat for the Committee.
- 2.2 The Project Manager will serve on the secretariat and perform the functions of rapporteur.

3. Meetings of the Committee

- 3.1 The PSC will convene regular meetings in accordance with the schedule for the project. It will otherwise maintain regular communication by e-mail and teleconference. Intersessional meetings may be convened as necessary (and within budget constraints) if proposed by one of the three countries and agreed by all three.
- 3.2 Advisory Panels shall be established for Monitoring Protocols and Education and Training as called for in the workplan. Membership and terms of reference for these advisory panels will be established by the PSC. The advisory panels will report directly to the PSC.
- 3.3 In addition to the advisory panels the PSC may convene *Ad hoc* committees to advise the PSC on specific matters. The Project Manager may also request that the PSC establish *Ad hoc* committees.

4. Terms of Reference

- 4.1 The PSC will operate by consensus to:
 - a) Provide overall direction to the project and to give guidance to the Project Manager and National Project Managers;
 - b) Review and approve the workplan and budget for the project;
 - c) Develop and approve terms of reference for the National Co-ordination Committees and oversee their functioning to ensure inter-ministry involvement and the active involvement of all stakeholders;
 - d) Develop criteria and guidelines for the demonstration projects, review and approve workplans for the demonstration projects and oversee their execution – making recommendations for mid-course corrections if necessary;
 - e) Co-ordinate with the Project Manager to ensure the project stays on schedule and that project outputs are being completed on time and within budget;
 - f) Co-ordinate the work of advisory panels or *Ad hoc* committees that may be established;
 - g) Assist UNEP-CAR/RCU in the event that more co-financing must be raised during the life of the project; and
 - h) Agree to these terms of reference in their first meeting and make any amendments as necessary.

5. Conduct of Committee Business

- 5.1 The PSC will operate on the basis of consensus. When consensus cannot be achieved, the secretariat in co-ordination with the Chairman shall facilitate negotiations to reach consensus.
- 5.2 The PSC may from time to time review these terms of reference and its membership and make necessary adjustments and amendments.

NATIONAL CO-ORDINATING COMMITTEE (NCC)

The NCC will serve to guide the overall implementation of the project at the national level and serve as the primary decision making body at the national level. The NCC will provide recommendations and information to the PSC through the National Project Manager (NPM).

Specifically, the NCC will ensure that project goals are being met at the national level and serve as the forum for national stakeholder participation.

1. Membership of the National Co-ordinating Committee:

- 1.1 The members of the NCC will be the national stakeholders, including, but not limited to: relevant government ministries (which at a minimum, will include the Ministries of Agriculture, Environment and Health), industry groups (agricultural producers and agrochemical), academia, and community-based, non-governmental and/or indigenous organizations.
- 1.2 The NPM will co-chair the NCC with a representative of the Ministry of Agriculture to both facilitate cooperation between the two ministries and enable adequate feedback to the Project Manager and PSC.
- 1.3 The NCC may opt to invite additional experts (observers/advisors) as necessary to any meeting of the Committee.

2. Secretariat

The NPM will arrange for secretariat services for the Committee and ensure that any reporting needs of the NCC, and NCC reporting to the PSC, are met.

3. Meetings of the Committee

- 3.1 The NPM will convene regular meetings in accordance with the schedule for the project. The NCC will otherwise maintain regular communication by e-mail and teleconference as appropriate and necessary.
- 3.2 The NCC may convene *Ad hoc* committees to advise the NCC on specific matters. Specifically, the NCC will consider the need for independent editorial review of demonstration project case studies.

4. Terms of Reference

The NCC will operate by consensus to:

- a. Provide overall direction to the project and to give guidance to the National Project Manager;
- b. Review and approve the workplan and budget for the national aspects of the project;

- c. Assist the PSC, through the NPM in developing criteria and guidelines for the demonstration projects;
- d. With the NPM, develop, review and approve workplans for the demonstration projects for submission to the PSC;
- e. Oversee demonstration project execution;
- f. Co-ordinate with the NPM to ensure the project stays on schedule and that project outputs are being completed on time and within budget;
- g. Co-ordinate the work of advisory panels or *Ad hoc* committees that may be established;
- h. Assist the NPM and PSC in the event that more co-financing must be raised during the life of the project; and
- i. Agree to these terms of reference in their first meeting with any amendments as necessary.

5. Conduct of Committee Business

- 5.1 The NCC will operate on the basis of consensus. When consensus cannot be achieved, the NPM shall bring the issues to the PSC to facilitate problem resolution.
- 5.2 The NCC may from time to time review these terms of reference and its membership and make necessary adjustments and amendments.

PROJECT MANAGER

Under the overall supervision and guidance of the Co-ordinator of UNEP-CAR/RCU and the Executive Coordinator of the UNEP/GEF Coordination Office, and following the project plan as described in the project brief, the incumbent will have full responsibility for the coordination of the project and specifically shall perform the following duties:

Technical/Programmatic

- Manage regional co-ordination of the project according to the agreed workplan and co-ordinate national implementation through the National Executing Agencies (Ministries of Environment of participating countries);
- Establish and maintain close liaison with National Project Managers for the effective implementation of the project;
- Assist the project countries in establishing National Coordination Committees and other Advisory bodies as described in the project documents;
- Foster effective stakeholder participation in the project at the regional and national levels;
- Co-ordinate with the UNEP-CAR/RCU CEPNET Programme Officer for the development and maintenance of a project website; and
- Presentation of project results at various forums as requested.

Administrative

- Ensure that the project is managed and implemented in accordance with GEF and UNEP project guidelines; including budget and reporting requirements;
- Develop and maintain appropriate records of expenditures and project outputs;
- Organise and convene project meetings, provide secretariat services for the Project Steering Committee;
- Draft appropriate terms of reference for project consultants, develop contractual arrangements as appropriate, manage their inputs to the project, and follow-up on administrative details in co-ordination with the Fund Management Officer of CAR/RCU;
- Maintain project accounts in co-ordination with the Fund Management Officer of CAR/RCU and solicit any additional project co-financing required from project partners or through the cultivation of new donors; and
- Perform other duties relevant to the project as assigned by the Co-ordinator or AMEP Programme Officer.

Qualifications:

Advanced university degree in agricultural or environmental sciences, or other relevant subjects. Experience with co-ordination of multidisciplinary, inter-country projects, particularly in the area of agriculture or environmental protection. Ten years of relevant work experience with at least three years international experience. United Nations experience an asset. Experience with Central/Latin American agriculture issues desired. Excellent written and oral communication skills in English essential and demonstrated working knowledge of Spanish required.