



## **UNDP Project Document**

### **UNDP-GEF Medium-Size Project (MSP)**

Government of Mauritius

United Nations Development Programme

Sustainable Management of POPs in Mauritius

#### **Brief description**

The overall objective of the projects is the implementation of the first two priorities of the NIP. The project will provide assistance to Mauritius in the management of obsolete POPs chemicals and sites that are significantly contaminated by POPs.

The specific outcomes of the project are: i).A suitable legal and enforcement structure to sustain the outcomes of the project in the future; ii).A comprehensive awareness and responsible care program to make importers, distributors, users and the general public aware of the risks involved in the use of chemicals in general and POPs specifically; iii).An effective non-DDT based vector control program that will limit the chance of importing malaria and outbreaks of malaria; iv).Removal and disposal of all obsolete POPs chemicals; v).Removal and disposal of the few remaining transformers that have PCB containing oils that exceed international standards; vi).Remediation of all POPs contaminated sites that exceed internationally acceptable standards; vii) To enhance the ability to develop and implement alternative strategies for malaria vector management with the ultimate aim to eliminate future use of DDT.

## **Table of Contents**

<b>SECTION I: ELABORATION OF THE NARRATIVE.....</b>	<b>5</b>
PART I: SITUATION ANALYSIS.....	5
PART II : STRATEGY .....	6
PART III : MANAGEMENT ARRANGEMENTS .....	7
PART IV: MONITORING AND EVALUATION PLAN AND BUDGET.....	9
PART V: LEGAL CONTEXT.....	9
<b>SECTION II: STRATEGIC RESULTS FRAMEWORK.....</b>	<b>11</b>
PART I : LOGICAL FRAMEWORK ANALYSIS .....	11
<b>SECTION III: TOTAL BUDGET AND WORKPLAN .....</b>	<b>14</b>
<b>SECTION IV: ADDITIONAL INFORMATION</b>	
ANNEX A: MSP PROPOSAL	
ANNEX B: TERMS OF REFERENCE	
ANNEX C: SIGNATURE PAGE	

## Acronyms

AOSIS	Alliance of Small Island States
ANVR	African Network on Vector Resistance
AREU	Agricultural and Research Extension Unit
ARPEGE	Appui Régional pour la Promotion de l'Éducation à la Gestion de l'Environnement
BAT	Best Available Techniques
BEP	Best Environmental Practices
CEB	Central Electricity Board
COMESA	Common Market for Eastern and Southern Africa
CRM	Certified Reference Material
CSO	Central Statistics Office
CWA	Central Water Authority
DCC	Dangerous Chemicals Control (Act)
DDT	Dichlorodiphenyltrichloroethane
DDE	Dichlorodiphenyldichloroethylene (a DDT derivative)
EPA	Environment Protection Act (2002)
FAO	Food and Agricultural Organization
GCMS	Gas Chromatography Mass Spectrometry
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNP	Gross National Product
ICT	Information and Communication Technology
IPM	Integrated Pest Management
IPP	Independent Power Producers
IRS	Indoor Residual Spraying
IVM	Integrated Vector Management
ICCM	International Congerence on Chemical Management
MACOSS	Mauritius Council of Social Services
MEA	Multilateral Environmental Agreement
MOE	Ministry of Environment
MOF	Ministry of Finance & Economic Development
MOH	Ministry of Health & Quality of Life
MOLG	Ministry of Local Government
MSIRI	Mauritius Sugar Industry Research Institute
MUR	Mauritian Rupee
NDU	National Development Unit
NEL	National Environmental Laboratory
NGO	Non-governmental Organization
NIP	National Implementation Plan
PAS	Principal Assistant Secretary
PCBs	Polychlorinated biphenyls
PCDD/Fs	Polychlorinated Dibenzo-p-Dioxins and Furans
PEC	Probable Effect Concentration
POPs	Persistent Organic Pollutants
ppm	Parts per Million
PSC	Project Steering Committee
SAICM	Strategic Approach to International Chemicals Management
SADC	Southern African Development Community
SIDS	Small Islands Developing States
TAC	Technical Advisory Committee
TEC	Threshold Effect Concentration
TEQ	Toxicity Equivalent (a measurement to compare compounds in toxicity)
TOR	Terms of Reference
UNDP	United Nations Development Programme

UNEP United Nations Environment Programme  
UPOPS Unintentional POPs  
US\$ United States Dollar  
WHO World Health Organization  
WMA Wastewater Management Authority  
WTO World Trade Organization

## SECTION I: Elaboration of the Narrative

### PART I: Situation Analysis

Mauritius signed the Stockholm Convention May 23, 2001 and ratified the same July 13, 2004. It completed with GEF and UNDP technical and financial assistance a POPs National Implementation Plan (NIP) June 2005 which was approved its Government August 25, 2006. The country is therefore eligible for further GEF support under par. 9(b) of the GEF Instrument. The Republic of Mauritius, consisting essentially of the islands Mauritius and Rodrigues, completed its National Implementation Plan (NIP) in June 2005. The plan identifies following priorities:

- Disposal of obsolete POPs chemicals and decontamination of POPs-infested areas
- Development of alternative strategies for malaria vector management with reduced—or no—reliance on DDT
- Reduction of the unintentional release of dioxins and furans from uncontrolled burning

The use of POPs chemicals in Mauritius has largely been restricted to PCBs in transformers and DDT as malaria vector control agent. Small amounts of other POPs pesticides have been offered but were never applied in significant amounts. The application of PCBs in transformers has been stopped in the 80's but there are still some transformers in use that contain PCBs. As to DDT in vector control, this is still in use, albeit in moderate amounts—around 600 kg/y.

Following POPs inventories have been identified:

Store/site	POPs Chemical	Amount
Ministry of Health	DDT	116 tons
M.S.I.R.I.	Dieldrin	8 liters
Roger Fayd'Herbe	Mirex	64 kg
Deep River Beau Champ	Aldrin	13 liters
CEB	PCB containing oil	5,000 kg

The use of DDT has also led to soil contamination around previous and current storage sites. Improper handling when transferring DDT into spray equipment as well as deteriorated packaging keeps adding to this contamination at the only remaining DDT storage site in Pamplemousses.

### Theme 2

Mauritius has in the past experienced catastrophic malaria epidemics, but after the completion of the malaria eradication program the country was declared malaria-free in 1973. Despite this success, the malaria vector *Anopheles arabiensis* remains abundantly present, and outbreaks due to imported malaria cases do occur occasionally. A major risk of the reliance on chemical insecticides for vector control is the development of insecticide resistance in the vector. DDT resistance in *Anopheles arabiensis* has already been found in different parts of Africa, as reported by the African Network on Vector Resistance (ANVR). For example in Ethiopia, a major DDT-using country, there is evidence of widespread resistance to DDT (WHO, 2006). Resistance development in the vector to pyrethroid insecticides, though not yet reported in *An. arabiensis*, is widespread in many African countries in a closely-related sibling species. New and alternative insecticide products for malaria control are emerging at a slow pace. Therefore, there is need for the development of alternative measures and strategies that reduce the selective pressure for resistance development in the vectors. One of these alternatives is the so-called “Integrated Vector Control, or IVM.

To prevent reintroduction of malaria, the country has a thorough system for malaria case management in place. Moreover, a number of vector control methods are implemented which include the use of DDT. The present system of malaria control deals with the parasite and the vector. Human and environmental factors, however, are generally not within reach of the health sector.

The parasite component is effectively being addressed in Mauritius through a thorough system of free diagnosis, treatment and follow-up for all malaria cases, free prophylaxis for those traveling to malarious countries, and rigorous screening, treatment and monitoring of travelers from malarious countries. Vector control is conducted by spraying for adult and larval mosquito stages and to some extent by environmental methods.

Human factors of disease, such as practices and domestic conditions, and environmental factors (e.g. land-use) are not prime targets for the health sector. Nevertheless, activities aimed to influence human practices have started to be addressed in the chikungunya eradication program through health education and through the media, following the recent outbreaks on the island of this mosquito-borne human disease. The experience of the chikungunya epidemic has underscored that, in order to enhance vector-borne disease control, an integrated strategy is needed which also addresses the human and environment factors, and in which local stakeholders actively participate. The same principles apply to the prevention of malaria epidemics..

The plan on chikungunya with its elements of inter-sectoral collaboration, strong community involvement and the integrated use of vector control methods has created an opportunity to strengthen the malaria prevention program. Hence, the disease-specific plan to eradicate chikungunya could be utilized to establish a long-term institutionalized and decentralized IVM strategy, which is able to deal with the continuous threats of the introduction of malaria, dengue, Japanese encephalitis as well as other diseases for which the vectors are already present in the country.

The project meets the guiding principles and objectives of OP14 by seeking to provide assistance, on the basis of incremental costs, to Mauritius in eliminating releases of POPs into the environment.

## **PART II : Strategy**

The project will be executed in two components with the first addressing all obsolete POPs chemicals and decontamination of POPs-infested sites—including DDT—and the second a gradual introduction of a malaria vector control plan that will make the use of DDT in the mid-term redundant. The two components are connected through the current use of DDT for malaria vector control which constitutes the largest source of obsolete POPs and POPs contamination. While one part disposes and decontaminates, the other part prevents reoccurrence in the future in the one and only ongoing POPs application and assure in this way the project's sustainability.

Mauritius is, as far as malaria is concerned, in a unique position because this disease is imported. Current use of DDT concentrates on air- and seaports with occasional spraying in villages where secondary malaria cases have been reported.

The reasoning for this project is as follows:

- There is, apart from some DDT for malaria control, no current use of POPs in Mauritius. The use of POPs pesticides and PCBs has been discontinued and their import disallowed.
- Remaining obsolete POPs inventories have been identified and the owners are ready to surrender these for disposal. The only reason this has not been done before is that no owner knows how to dispose of these in a responsible way. Mauritius has no disposal facilities for liquid and very limited capacity for solid hazardous waste. Continued storage would increase the potential for release to the environment—as would incorrect disposal do. To counter such potential release a one-time POPs disposal program is required.

- Past and current use of DDT for malaria vector control is wrought with environmental problems:

- DDT inventory is large and in no relation to the modest annual use
- Its management is problematic and causes release into the environment
- Past storage and transfer has caused contamination of the surrounding areas

While remediation of the current contamination is possible, better management is mandatory to avoid future contamination. This will require repackaging, a loss-free transfer system and, to reduce the extent of the problem, disposal of surplus inventory.

- Ultimate resolution of the problems related to the use of DDT as vector control agent would be to discontinue its use. There are DDT-free systems and the project proposes to introduce these in Mauritius. This would allow elimination of all remaining DDT stock or, to maintain a properly safeguarded small inventory for emergency purposes.

### **PART III : Management Arrangements**

This project will be executed by the Ministry of Environment and National developing Unit (MOE) with the support of UNDP Country Office under Country Office Support to NEX modality. The recruitment of consultants and other contractual arrangements such as procurement of goods of significant value will be provided by UNDP.

The project will be monitored by a Steering Committee (SC). It will meet bi-annually to review implementation progress, endorse work plans, provide guidance and assist in the resolution of any issues experienced during implementation. The committee will be chaired by the National Project Director of the Ministry of Environment and appointed from the following entities:

- Ministry of Health & QL
- Ministry of Environment & NDU
- Ministry of Public Utilities
- Ministry of Industry, Small & Medium Enterprises, Commerce & Cooperatives
- Farmers Service Corporation
- MSIRI
- MACOSS
- Ministry of Agro Industry & Fisheries
- CEB
- Mauritius Revenue Authority (Customs & Excise Department )
- AREU
- University of Mauritius
- Ministry of Finance & Economic Development
- UNDP
- Ministry of Labour & I.R.
- Ministry of Local Government
- Ministry of Tourism
- NGOs (APEXHOM, MACOSS, MFW AND PANeM)

MOE will carry overall executing responsibility of all aspects of the execution of the project. It will appoint a **National Project Director** (NPD), responsible for:

- reporting and monitoring,
- standard setting (waste disposal as well as clean-up levels),
- all aspects of execution not assigned to UNDP (major contracts),

- any other project-related activities, and
- Coordination with other ministries in their areas of responsibilities<sup>1</sup>

A Project Manager for each theme will be recruited following relevant UNDP procedures. Both Project Managers will report to the NPD.

The National **Project Director (NPD)** will be assigned by MOE the overall responsibility for the implementation of the projects. The NPD will have financial responsibility as per local UNDP guidelines, serve as secretary of the SC, provide administrative support to this committee and be responsible for the coordination with other ministries. He/she will supervise their activities.

The **Task-1 Project Manager** will be recruited by UNDP for the entire implementation period of the task. Activities in the context of Theme-1 include:

- the task's timely execution;
- preparation of work plans
- progress reporting;
- directing the input of consultants and contractors, retained under this task; preparation of terms of reference for particular activities; and
- preparation of procurement requests to UNDP.

Required qualifications are a graduate degree in chemistry, environmental sciences or related fields; at least 6 years and at least six years experience. Experience with waste removal and environmental cleanup activities is desirable while proficiency in English mandatory.

The **Task-2 Project Manager** will be recruited by UNDP and serve for the entire implementation of the task. Activities in the context of Theme-2 include:

- the task's timely execution;
- prepare work plans on IVM in collaboration with the national partners;
- mobilize inputs to support the work plans;
- maintain close and functional linkages with national partners;
- coordinate IVM activities and its linkages with the chikungunya program;
- communicate activities with the Project Manager;
- direct or assist in the preparation of reports on project activities;
- maintenance and reporting of administrative and financial records.

This expert will conduct first-hand monitoring and quality control of the inputs by the subcontractors and consultants operating under Theme 2, the results of which will be reported to the NPD. Required qualifications are a post-graduate degree in entomology; at least 6 years of experience in disease vector management; knowledge about public health activities at the district level; experience with participatory approaches is desirable; demonstrated capability to work effectively with national policy makers, program managers and researchers; proficiency in English.

National and international experts will be recruited by UNDP based on TORs prepared by the NPD and the Theme project managers. At this point, one of each per Theme appears to be sufficient.

In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF. The UNDP logo should be more prominent -- and separated from the GEF logo if possible, as UN visibility is important for security purposes.

---

<sup>1</sup> For instance, The ministry of Local Government is responsible for waste removal.



#### **PART IV: Monitoring and Evaluation Plan and Budget**

Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team with support from UNDP/GEF.

The project will eliminate the use of DDT in malaria vector control and PCB containing oils in electrical transformers in combination with a POPs disposal and decontamination program. This will include:

- Demonstration of alternative, non-DDT vector control methods
- Replacement of PCB-containing transformers
- Disposal of obsolete DDT (116 t minus what will be used in the transition period)
- Disposal of obsolete PCB containing oils (5 t)
- Disposal of obsolete POPs pesticides (85 kg)
- Decontamination of about 450 m<sup>2</sup> DDT-infested soil
- Creation of awareness of and skills to deal with POPs in particular and hazardous chemicals in general

Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF policies and procedures. Specifically, compliance with GEF-4 indicators, being:

- Regulatory and enforcement capacity in place
- Obsolete pesticides disposed of
- PCBs phased out and disposed of
- Reduced risk of exposure to POPs of project-affected people
- Knowledge management packages developed, and
- Viability/cost-effectiveness of alternatives to POPs, particularly in Theme-1, is demonstrated in a number of settings

will be observed.

A Project Steering Committee including the government, UNDP, industry and NGO representatives will be constituted at project inception and will meet quarterly to

- review project progress,
- provide strategic guidance, and
- approve annual work plans and budgets.

The project team will report to the Project Steering Committee on a regular basis as follows:

- Through **quarterly reports** as per UNDP rules. For this reporting a suitable results-based reporting component will be designed
- Through **annual reports** as per UNDP and GEF rules. For this reporting, a harmonized APR/PIR (UNDP's Annual Project Report and GEF's Project Implementation Report) will be prepared and disseminated each year between April and June
- A mid-term evaluation will not be carried out based on the project's design
- An independent evaluator will conduct a terminal evaluation with a lessons-learned section for wide distribution to other countries planning similar projects.

Monitoring and Evaluation plan and budget is as below.

<b>M&amp;E activity</b>	<b>Lead responsible party</b>	<b>Budget (GEF)</b>	<b>Time frame</b>
Inception Report	Project Implementation Team	None	At the beginning of project implementation
Annual Project Report (APR) and Project Implementation Review (PIR)	The Government, <b>Implementing Agency (IA) Country Office</b> , National Executing Agency, Project Team, IA Task Manager, and Target Groups	None	Every year, at latest by July of that year
Implementing Agency (IA) annual reports	The Government, IA Country Office, National Executing Agency, Project Team, <b>IA Task manager</b> , and Target Groups	None	Every year
Frequent Progress reports	Project Manager	None	To be determined by Executing Agency
Mid-term evaluation	Government, IA Country office	None	Will not be conducted.
Terminal Evaluation, including lessons learned	GEF Secretariat, Project team, IA headquarters and Task Manager, IA Country Office, National Executing Agency	16,000	At the end of project implementation
Terminal Report	IA Country Office, IA Task Manager, Project Team	None	At least one month before the end of the project
Audit	National Executing Agency, IA Country Office, Project Team	4,000 (total for project duration)	Yearly

#### **PART V: Legal Context**

This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Mauritius and the United Nations Development Programme, signed by the parties in 1993. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

UNDP acts in this Project as Implementing Agency of the Global Environment Facility (GEF), and all rights and privileges pertaining to UNDP as per the terms of the SBAA shall be extended mutatis mutandis to GEF.

The Resident Representative of the UNDP Mauritius Country Office is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- a) Revision of, or addition to, any of the annexes to the Project Document;
- b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- d) Inclusion of additional annexes and attachments only as set out here in this Project Document

## SECTION II: STRATEGIC RESULTS FRAMEWORK

### PART I : Logical Framework Analysis

**Table 1: Project Logical Framework**

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
<p><b>Development objective</b> To reduce emission of POPs into the global environment</p>			
<p><b>Immediate objective</b> To enhance the national ability to prevent or manage vector-borne diseases with reduced reliance on DDT</p>	<p>a. Reduced seasonal densities of malaria vector mosquitoes b. Reduced annual use of DDT c. Absence of malaria outbreaks</p>	<p>Reports made by partner organizations Impact study (before and after) in selected locations</p>	<p>a. Assumes continued central government support for inter-sectoral collaboration and decentralization of health services b. Assumes that prophylactic measures and medication efforts for malaria control remain at the current high level</p>
<p><b>Output 1</b> Continued need for DDT evaluated</p>	<p>a. Risk assessment of imported disease conducted b. Laboratory studies and small-scale field trials on efficacy of DDT and alternative chemicals completed c. Study results to serve as basis for possible replacement of DDT with other insecticides</p>	<p>a. Field visits by project staff and reports on research findings from partner organization b. Official data on insecticide use for indoor residual spraying</p>	<p>Assumes that the evaluation results will form a conclusive basis for decision-making</p>
<p><b>Output 2</b> Decentralized capacity for surveillance strengthened</p>	<p>a. Health inspectors and vector control teams in the project districts trained and supervised on aspects of vector surveillance b. Doubling of coverage or frequency of surveillance in project districts.</p>	<p>a. Project monitoring and evaluation visits. b. Central-level supervisory visits c. Surveillance records and database.</p>	<p>Assumes an increased mandate for district health offices. This is considered inherent to the decentralization effort and is expected to enhance local ownership</p>
<p><b>Output 3</b> Decentralized IVM strategy established</p>	<p>a. Mechanisms established and methods developed for analysis and decision-making for IVM at district and municipal levels b. Curricula developed for hands-on education of local stakeholders on the biology and epidemiology of disease c. District staff trained on facilitation skills d. Multi-stakeholder IVM committees and implementation of IVM established in project districts</p>	<p>a. Project monitoring and evaluation visits b. Reports of specific meetings by health staff c. Detailed case study reports</p>	<p>Assumes that actors other than Health are willing to take responsibility for environmental health. Mitigation: the provided education will link vector-borne disease to domestic, construction and agricultural activities (incl. sugar sector)</p>
<p><b>Output 4</b> IVM demonstrated in project districts</p>	<p>a. Increase in environmental management by communities b. Low seasonal peaks of vector mosquitoes c. Absence of malaria outbreaks</p>	<p>a. Mosquito surveillance data b. Health office reporting system c. Impact assessment study covering health, ecological, behavioral and socio-economic parameters</p>	<p>Assumes coverage of project districts Risk: Occasional seasonal typhoons may lead to increased vector breeding habitat</p>

## 1: Objectively Verifiable Impact Indicators

See approved MSP proposal in Section IV of the PRODOC (specifically Annex V – Project Logical Framework).

**Table 2: Indicative Outputs, Activities and quarterly workplan**

Project implementation plan (Theme 1)				
Activity by output	Timeline			
	Year 1	Year 2	Year 3	Year 4
<b>Output 1: Evaluation and Safeguarding</b>				
1.1 Complete testing for contamination of soil and cross-contamination of equipment				
1.2 Safeguard existing obsolete POPs stock				
1.3 Identify disposal methods, disposal sites and transportation methods and clean-up thresholds				
<b>Output 2: Disposal of obsolete POPs Inventories</b>				
2.1 Preparation of disposal specifications				
2.2 Contracting of a disposal site following UNDP bidding guidelines				
2.3 Actual disposal and Certification of disposal				
<b>Output 3: Clean-up of POPs-contaminated Areas</b>				
3.1 Preparation of clean-up specifications				
3.2 Selection of a contractor following pertinent UNDP bidding guidelines				
3.3 Certification of decontamination				
<b>Output 4: Institution of a “Responsible Care” Program</b>				
4.1 Conduct a training needs, analysis, a task analysis, and develop learning objectives.				
4.2 Prepare a training syllabus				
4.3 Deliver the training				

**Project implementation plan (Theme 2)**

Activity by output	Timeline			
	Year 1	Year 2	Year 3	Year 4
<b>Output 1: Continued need for DDT evaluated</b>				
1.1 Risk assessment of imported vector-borne disease	■			
1.2 Laboratory and small-scale field trials on efficacy of DDT and alternative insecticides, incl. dissemination of results	■	■		
1.3 Facilitating decision making on selection of insecticide for indoor residual spraying		■		
<b>Output 2: Decentralized capacity for surveillance</b>				
2.1 Development of methods for decentralized surveillance of vector mosquitoes	■			
2.2 Workshops for training district staff on surveillance of vector mosquitoes		■		
2.3 On-the-job training to establish mosquito surveillance in project districts		■	■	■
2.4 Assistance and supervision by central level				■
<b>Output 3: Decentralized IVM strategy established</b>				
3.1 Workshops to develop curricula for hands-on education of local stakeholders	■			
3.2 Training workshops on facilitation skills for district staff	■	■		
3.3 Workshops to develop methods for analysis and decision-making on IVM at district and municipal level	■	■		
3.4 Multi-stakeholder workshops on IVM to establish IVM committees at district/municipal level		■	■	■
3.5 Establishing a central data management system on IVM		■	■	■
<b>Output 4: IVM demonstrated in pilot districts</b>				
4.1 Longitudinal impact study covering health, ecological, behavioral and socio-economic parameters in project districts	■	■	■	■
4.2 Qualitative case study descriptions of the process of decentralized development of IVM		■	■	■
4.3 Dissemination of results		■	■	■

### SECTION III: Total Budget and Workplan

<b>Award ID:</b>	50118
<b>Award Title:</b>	Sustainable Management of POPs
<b>Business Unit:</b>	MUS10
<b>Project Title:</b>	Republic of Mauritius, Sustainable Management of POPs
<b>Project ID:</b>	PIMS no.3779
<b>Implementing Partner (Executing Agency)</b>	Ministry of Environment

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 2008 (USD)	Amount Year 2 2009 (USD)	Amount Year 3 2010 (USD)	Amount Year 4 2011 (USD)	Total (USD)	See Budget Note:
<b>OUTCOME 1:</b> Disposal of Obsolete POPs and decontamination of POPs Infested Areas	MOE/MOH	62000	GEF	71200	International Consultants	10000	40000	40000	15000	105000	x
				71300	Local Consultants	10,000	35000	30000		75000	x
				72100	Contractual services	10000	50000	43000	25000	128000	
				72100	Training (Contract)	5000	12500	12500	15000	45000	
				72500	Supplies	1000	2000	2000		5000	
				74200	Production Costs	0	2000	4000	4000	10000	
					<b>Total Outcome 1</b>	<b>36000</b>	<b>141500</b>	<b>131500</b>	<b>59000</b>	<b>368000</b>	
<b>OUTCOME 2:</b> Development of Alternative Strategies for Malaria Vector Management	MOE/MOH	62000	GEF	71200	International Consultants	5000	60000	60000	50000	175000	
				71300	Local consultants	5000	54000	50500	38500	148000	
				72100	Service Cont	5000	35000	15000	20000	75000	
				72200	Equipment	9000	11000	8000	5000	33000	
				72500	Supplies	3000	3000	3000	3000	12000	
				74200	Publication	0	250	250	250	750	
					<b>Total Outcome 2</b>	<b>27000</b>	<b>163250</b>	<b>136750</b>	<b>116750</b>	<b>443750</b>	
<b>OUTCOME 3:</b> Adaptive Management & Monitoring/Evaluation	MOE/MOH	62000	GEF	71300	Local consultants		1500			1500	x
				71400	Project Management	10000	15000	15000	20000	60000	
				71600	Travel	1000	1000	1000	1000	4000	
				72200	Equipment	8000				8000	
				72100	Contract (Audit/Evaluation)	0	7000	1500	1500	10000	
				74500	Miscellaneous	2000	2000	1500	1500	7000	
					<b>Total Outcome 3</b>	<b>21000</b>	<b>26500</b>	<b>19000</b>	<b>24000</b>	<b>90500</b>	
<b>PROJECT TOTAL</b>						<b>84000</b>	<b>331250</b>	<b>287250</b>	<b>199750</b>	<b>902250</b>	

**Summary of  
Funds:<sup>2</sup>**

	Amount Year 1 2008 (USD)	Amount Year 2 2009 (USD)	Amount Year 3 2010 (USD)	Amount Year 4 2011 (USD)	Total (USD)
<b>GEF</b>	<b>84,000</b>	<b>331,250</b>	<b>287,250</b>	<b>199,750</b>	<b>902,250</b>
Ministry of Environment	28,000	60,000	60,000	50,000	198,000
Ministry of Health	148,000	201,000	202,750	203,250	755,000
Others (CEB, APEXHOM)	0	10,000	10,000	10,000	30,000
<b>TOTAL</b>	<b>260,000</b>	<b>602,250</b>	<b>560,000</b>	<b>463,000</b>	<b>1,885,250</b>

---

<sup>2</sup> Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc. etc







**GEF**

**MEDIUM-SIZED PROJECT PROPOSAL**  
**REQUEST FOR FUNDING UNDER THE GEF TRUST FUND**

**GEFSEC PROJECT ID:**  
**IA/ExA PROJECT ID:** PIMS # 3779  
**COUNTRY:** Mauritius  
**PROJECT TITLE:** Sustainable Management of POPs, Phase I  
**GEF IA/ExA:** UNDP  
**OTHER PROJECT EXECUTING AGENCY(IES):** n/a  
**DURATION:** 48 Months  
**GEF FOCAL AREA:** POPs  
**GEF STRATEGIC OBJECTIVES:**

- Strengthening NIP Implementation Capacity
- Partnering in Investments needed for NIP Implementation to achieve Impacts in POPs Reduction

**GEF OPERATIONAL PROGRAM:** OP14  
**IA/ExA FEE:** US\$ 85,523 (9%)  
**CONTRIBUTION TO KEY INDICATORS IDENTIFIED IN THE FOCAL AREA STRATEGIES:**

II.2 Number of countries with strengthened capacity for enforcement through increased identification of PCB equipment and registration

II.3 Number of countries with increased awareness of POPs through industry targeted action

III.1 POPs phased-out from use in transformers and disposing remaining PCB-contaminated oils

IV.2 Number of countries where new practices or technologies are introduced

FINANCING PLAN (\$)		
	PPG	Project
<b>GEF Total</b>	48,000	902,250
<b>Co-financing</b>	(provide details in Section b: Co-financing)	
GEF IA/ExA		0
Government	5,000	900,000
Others		30,000
<b>Co-financing Total</b>	5,000	930,000
<b>Total</b>	53,000	1,832,250
Financing for Associated Activities If Any:		


FOR JOINT PARTNERSHIP*		
GEF PROJECT/COMPONENT (\$)		

\* Projects that are jointly implemented by more than one IA or ExA

MILESTONES	DATES
PIF APPROVAL	n/a
PPG APPROVAL	PDFA: 06/2006
MSP EFFECTIVENESS	excellent
MSP START	07/2007
MSP CLOSING	07/2011
TE/PC REPORT*	12/2011

\*Terminal Evaluation/Project Completion Report

Approved on behalf of the (*Enter accountable GEF Agency*). This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the Review Criteria for GEF Medium-sized Projects.

  
 Mr. Yannick Glemarec  
 IA/ExA Coordinator  
 Date: June 2007

Dr. Suely Carvalho  
 Project Contact Person  
 Tel. and email: [suely.carvalho@undp.org](mailto:suely.carvalho@undp.org)



**MEDIUM-SIZED PROJECT PROPOSAL  
REQUEST FOR FUNDING UNDER THE GEF TRUST FUND**

**GEFSEC PROJECT ID:** 3205  
**IA/ExA PROJECT ID:** PIMS # 3779  
**COUNTRY:** Mauritius  
**PROJECT TITLE:** Sustainable Management of POPs in Mauritius  
**GEF IA/ExA:** UNDP  
**OTHER PROJECT EXECUTING AGENCY(IES):** n/a  
**DURATION:** 48 Months  
**GEF FOCAL AREA:** POPs  
**GEF STRATEGIC OBJECTIVES:**

- Strengthening NIP Implementation Capacity
- Partnering in Investments needed for NIP Implementation to achieve Impacts in POPs Reduction

**GEF OPERATIONAL PROGRAM:** OP14  
**IA/ExA FEE:** US\$ 90,225 (10%)  
**CONTRIBUTION TO KEY INDICATORS IDENTIFIED IN THE FOCAL AREA STRATEGIES:**

II.2 Number of countries with strengthened capacity for enforcement through increased identification of PCB equipment and registration

II.3 Number of countries with increased awareness of POPs through industry targeted action

III.1 POPs phased-out from use in transformers and disposing remaining PCB-contaminated oils

IV.2 Number of countries where new practices or technologies are introduced

FINANCING PLAN (\$)		
	PPG	Project
<b>GEF Total</b>	48,000	902,250
<b>Co-financing</b>	(provide details in Section b: Co-financing)	
GEF IA/ExA		0
Government	5,000	900,000
Others		30,000
<b>Co-financing Total</b>	5,000	930,000
<b>Total</b>	53,000	1,832,250
Financing for Associated Activities If Any:		

FOR JOINT PARTNERSHIP*		
GEF PROJECT/COMPONENT (\$)		

\* Projects that are jointly implemented by more than one IA or ExA

MILESTONES	DATES
PIF APPROVAL	n/a
PPG APPROVAL	PDF/A: 06/2006
MSP EFFECTIVENESS	Excellent
MSP START	03/2008
MSP CLOSING	03/2012
TE/PC REPORT*	09/2012

\*Terminal Evaluation/Project Completion Report

Approved on behalf of the *(Enter accountable GEF Agency)*. This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the Review Criteria for GEF Medium-sized Projects.

Mr. Yannick Glemarec  
 IA/ExA Coordinator  
 Date: June 2007

Dr. Suely Carvalho  
 Project Contact Person  
 Tel. and email: [suely.carvalho@undp.org](mailto:suely.carvalho@undp.org)

## **PART I - PROJECT**

### **1. PROJECT SUMMARY**

#### **a) PROJECT RATIONALE, OBJECTIVES, OUTCOMES/OUTPUTS, AND ACTIVITIES.**

This project—consistent with the POPs focal area Strategic Objectives and with the objectives of OP 14—will provide assistance to Mauritius in the management of obsolete POPs chemicals and sites that are significantly contaminated by POPs.

In addition, the project will introduce strategies that will provide Mauritius with the tools to prevent future POPs contamination by avoiding the use of POPs altogether. Mauritius' National Implementation Plan (NIP) identifies the following implementation priorities:

- Disposal of obsolete POPs chemicals and decontamination of POPs-infested areas
- Development of non-chemical strategies for malaria vector control
- Reduction of the unintentional release of dioxins and furans from uncontrolled burning

The objective of this project is the implementation of the first two priorities from the NIP. Upon completion of the project, the following outcomes are expected:

1. A suitable legal and enforcement structure to sustain the outcomes of the project in the future
2. A comprehensive awareness and responsible care program to make importers, distributors, users and the general public aware of the risks involved in the use of chemicals in general and POPs specifically
3. An effective non-DDT based vector control program that will limit the chance of importing malaria and outbreaks of malaria
4. Removal and disposal of all obsolete POPs chemicals
5. Removal and disposal of the few remaining transformers that have PCB containing oils that exceed international standards
6. Remediation of all POPs contaminated sites that exceed internationally acceptable standards

Related to these expected outcomes, following outputs are expected:

1. Disposal plans will be prepared for all identified POPs containing stockpiles;
2. Rehabilitation plans will be prepared for each identified POPs contaminated site;
3. Pilot remediation will be conducted to allow stakeholders to gain valuable knowledge and experience;
4. Remediation of other sites will be conducted using acquired local capacity and expertise through counterpart funding.
5. Together with industry and agricultural associations a “Responsible Care” program will be implemented and maintained through recurrent training;
6. The existing regulatory framework will be reviewed and, where applicable, adapted.

To achieve the mentioned outcomes, Mauritius will set up a Project Management Unit and expand on capacities that have been developed during the NIP preparation process.

While the overall responsibility for the execution will be with the Ministry of Environment (MOE), which also will directly execute the disposal /decontamination part (Theme-1), the vector control component (Theme-2) will be executed by and under responsibility of the Ministry of Health (MOH).

## b) KEY INDICATORS, ASSUMPTIONS, AND RISKS

Expected Outcomes	Key Indicators	Assumptions
Disposal of all obsolete POPs	Destruction Certification	Agreement on disposal method(s)
Institution of suitable accompanying legal and awareness systems	Training certificates; Laws	Agreement between all stakeholders
Reduction of DDT inventories to agreed upon emergency stock	Donation of excess stock in cooperation with WHO	Determination of minimum stock requirements Cooperation by WHO
Cleanup of DDT infested areas	Post testing	Agreement on maximum allowable Concentrations
Evaluation of the current DDT-based vector control system and selection of alternatives	Agreement with MOE and MOH on alternative, non-DDT insecticides	Agreement between all stakeholders
Implementation of (non-DDT) Integrated Vector Management through: - Decentralization of vector surveillance - Implementation of IVM - Application in pilot districts	Strengthened surveillance management system Field reports Reports from pilot areas	DDT use will stop and remaining stock will be used in case of emergencies only

Success of a project is never absolutely guaranteed but in this case, a careful analysis of possible risks appears to be in order. Mauritius had a haunting experience with imported malaria in the second half of the 19th century. In the worst year, 1867, between 12 and 25% of the entire population died from malaria. Many regulators as well as health officials consider the current DDT stock—around 116 t while only around 600 kg/y is used—a guarantee that this will never happen again. Acceptance and gradual implementation of a DDT-free vector control system is a must or public opinion may turn against the project—even if recurrence of the past disaster is extremely remote and just DDT stock will not avoid it.

There are other, more common risks. Following table shows identified uncertainties, an analysis of their potential risks and what mitigation is proposed to minimize their potential effects:

RISK	LIKELIHOOD	MITIGATION
Overlap with other institutions	Low	Close coordination with regional POPs vector control projects and keep other Agencies informed
Lack of cooperation in the execution of the non-DDT vector control, where MOE focuses on the elimination of POPs use and stockpiling and MOH focuses on public safety	Medium	Close supervision by UNDP and frequent status discussion between Ministries Also, input from international experts that will assure feedback form other GEF projects on non-DDT vector controls
Effective implementation	Low	Use experienced experts and work closely with industry and government
Delivery of co-finance commitments	Low	Collect written commitments and inform co-payers regularly
Sustainability	Medium	Emphasize enforcement from the beginning
Public perception	High	Conduct a public awareness program

**Link with SAICM.** The “Responsible Care” Program component of the project - whose focus will be to build capacity on a) understanding the character of the chemicals currently in use, b) workers protection

and safety when using these chemicals, c) minimization of environmental impact, d) avoidance/minimization of obsolete stocks, and e) proper treatment of (minimized) stocks - will strengthen foundational capacities for chemicals management within the country and thereby, serve to support the GEF's strategic aim to promote the sound management of chemicals, as well as the Strategic Approach to International Chemicals Management (SAICM). SAICM, adopted in February 2006, supports the achievement of the WSSD Johannesburg Plan of Implementation goal that seeks to ensure that, by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health.

## **2. COUNTRY OWNERSHIP**

### **a) COUNTRY ELIGIBILITY**

Mauritius signed the Stockholm Convention May 23, 2001 and ratified the same July 13, 2004. It completed with GEF and UNDP technical and financial assistance a POPs National Implementation Plan (NIP) June 2005 which was approved its Government August 25, 2006. The country is therefore eligible for further GEF support under par. 9(b) of the GEF Instrument.

### **b) COUNTRY DRIVENNESS**

This project is consistent with the NIP Mauritius developed and GEF approved. In the NIP, the Governments of Mauritius made the following policy statement:

*“The Government of Mauritius is fully committed to meet its obligations under the Stockholm Convention. The National Implementation Plan (NIP) makes recommendations and proposes action for the phasing out of the various POPs sources and the management of the reduction and the elimination of existing stockpiles in the short, medium and long terms. Every effort will be made to achieve the objectives of the Stockholm Convention through full implementation of the NIP.”*

This statement applies to this project document as well as it concerns the implementation of actions made under the NIP.

## **3. PROGRAM AND POLICY CONFORMITY**

### **a) PROGRAM DESIGNATION AND CONFORMITY**

The project meets the guiding principles and objectives of OP14 by seeking to provide assistance, on the basis of incremental costs, to Mauritius in eliminating releases of POPs into the environment. It will contribute to three of the five Outcomes envisaged for OP14, namely that:

- (a) The institutional and human resource capacity for the management of POPs is strengthened.
- (b) The policy and regulatory framework is strengthened to facilitate environmentally sound management of POPs and other chemicals.
- (c) Stockpiles of POPs and wastes that contain POPs are managed, contained or disposed of in an environmentally responsible manner.

The project activities are in line with eligible “on-the-ground” interventions as outlined in the GEF POPs Operational Program., particularly with the section dealing facilitating environmentally sound management of stockpiles and the disposal of wastes that contain POPs by

- (a) Identification and environmentally sound management of POPs stockpiles;
- (b) Identification, containment and stabilization of POPs wastes and related affected areas;
- (c) Environmentally sound destruction of wastes that contain POPs and remediation of related affected sites, where warranted, taking into account the assessment of the risks posed to ecosystems and human health and cost-effectiveness.

**b) PROJECT DESIGN (INCLUDING LOGFRAME AND INCREMENTAL REASONING)**

The activities proposed in this project will allow Mauritius to implement a major part of its POPs phaseout strategy as laid down in its National Implementation Plan for the Stockholm Convention on persistent organic pollutants. The following sections provide in a summarized form the project’s background, objectives, outcomes, outputs and details of activities. The project has been divided into two relatively autonomous parts:

- 1. Disposal and Remediation
- 2. Prevention through Alternative—non POPs—Strategies

These project segments are described in more detail in **Annex-1** and **-2**. The project implementation framework is summarized in **Annex-3** and the Monitoring and Evaluation Plan in **Annex-4**. **Annex-5** contains a list of abbreviations used in this document. The following sub-sections provide background, project objectives, project description, outcomes, outputs and details of activities:

**(i) Background**

The Republic of Mauritius, consisting essentially of the islands Mauritius and Rodrigues, completed its National Implementation Plan (NIP) in June 2005. The plan identifies following priorities:

- Disposal of obsolete POPs chemicals and decontamination of POPs-infested areas
- Development of alternative strategies for malaria vector management with reduced—or no—reliance on DDT
- Reduction of the unintentional release of dioxins and furans from uncontrolled burning

The use of POPs chemicals in Mauritius has largely been restricted to PCBs in transformers and DDT as malaria vector control agent. Small amounts of other POPs pesticides have been offered but were never applied in significant amounts. The application of PCBs in transformers has been stopped in the 80’s but there are still some transformers in use that contain PCBs. As to DDT in vector control, this is still in use, albeit in moderate amounts—around 600 kg/y.

Following POPs inventories have been identified:

Store/site	POPs Chemical	Amount
Ministry of Health	DDT	116 tons
M.S.I.R.I.	Dieldrin	8 liters
Roger Fayd’Herbe	Mirex	64 kg
Deep River Beau Champ	Aldrin	13 liters
CEB	PCB containing oil	5,000 kg

The use of DDT has also led to soil contamination around previous and current storage sites. Improper handling when transferring DDT into spray equipment as well as deteriorated packaging keeps adding to this contamination at the only remaining DDT storage site in Pamplemousses.

## **(ii) Project Objectives**

The objective of this project is the implementation of the first two priorities from the NIP. Mauritius decided to combine addressing the first two priorities in one project because of perceived synergies that will facilitate implementation and reduce related costs. Both priorities involve disposal and remediation<sup>1</sup>, while the third priority will focus more on process modifications. In addition, sustainable disposal of and decontamination from POPs chemicals can only be obtained when the underlying cause is removed. Therefore the combination of both priorities secures sustainability as well.

Imports, exports and use of all POPs except DDT are already forbidden in Mauritius. Phasing out the use of DDT while ridding the country from existing obsolete stockpiles and related contamination combined with adequate enforcement, awareness and training will create a sustainable POPs-free system on the islands.

## **(iii) Project Description**

The project will be executed in two components with the first addressing all obsolete POPs chemicals and decontamination of POPs-infested sites—including DDT—and the second a gradual introduction of a malaria vector control plan that will make the use of DDT in the mid-term redundant. The two components are connected through the current use of DDT for malaria vector control which constitutes the largest source of obsolete POPs and POPs contamination. While one part disposes and decontaminates, the other part prevents reoccurrence in the future in the one and only ongoing POPs application and assure in this way the project's sustainability.

Mauritius is, as far as malaria is concerned, in a unique position because this disease is imported. Current use of DDT concentrates on air- and seaports with occasional spraying in villages where secondary malaria cases have been reported.

The reasoning for this project is as follows:

- There is, apart from some DDT for malaria control, no current use of POPs in Mauritius. The use of POPs pesticides and PCBs has been discontinued and their import disallowed.
- Remaining obsolete POPs inventories have been identified and the owners are ready to surrender these for disposal. The only reason this has not been done before is that no owner knows how to dispose of these in a responsible way. Mauritius has no disposal facilities for liquid and very limited capacity for solid hazardous waste. Continued storage would increase the potential for release to the environment—as would incorrect disposal do. To counter such potential release a one-time POPs disposal program is required.
- Past and current use of DDT for malaria vector control is wrought with environmental problems:
  - DDT inventory is large and in no relation to the modest annual use
  - Its management is problematic and causes release into the environment
  - Past storage and transfer has caused contamination of the surrounding areas

While remediation of the current contamination is possible, better management is mandatory to avoid future contamination. This will require repackaging, a loss-free transfer system and, to reduce the extent of the problem, disposal of surplus inventory.

- Ultimate resolution of the problems related to the use of DDT as vector control agent would be to discontinue its use. There are DDT-free systems and the project proposes to introduce these in Mauritius. This would allow elimination of all remaining DDT stock or, to maintain a properly safeguarded small inventory for emergency purposes.

---

<sup>1</sup> Remediation will include containment and clean-up. It should be emphasized that GEF funds would only be applied to containment and capacity building through a pilot project. Other cleanup will be paid for through co-financing.

A barrier for successful implementation of DDT-free malaria vector control would be hesitance at the Ministry of Health to operate without DDT unless other systems have been locally proven to be effective. In view of this, Mauritius did notify the Secretariat of the Stockholm Convention on 24 August, 2004 of its intended continued use of DDT for disease vector control in accordance with WHO recommendations and guidelines. However, recently the WHO affirmed its commitment to DDT reduction in malaria control as well the effectiveness of integrated vector control. MOH is now taking a more positive stance, as a result of which the prospect of sustainable collaboration between the sectors has improved.

A case could be made that the small amounts and the remote location of Mauritius do not pose a threat to the global environment. However, all POPs chemicals are toxic and persistent in the environment and therefore prone to migration. Any release in Mauritius constitutes as release into the global ecology. Of particular concern are possible effects of DDT release into the island's fragile coral and marine ecosystems. Most project activities—and all that funding for is requested—are incremental from a GEF perspective. The argumentation for this is summarized in the table below:

Activity	Baseline	GEF alternative
Awareness among key stakeholders is increased	There is currently low awareness under the population, in particular on malaria control, but a large latent anxiety related to previous malaria outbreaks. NGOs, while sometimes vocal, have no fundamental knowledge	Relevant information material and dissemination of this will be undertaken. Village meetings may be organized in addition. NGOs will be closely involved in the implementation, in particular in the chemical awareness component
Companies, contractors and agricultural users to be trained in safe handling and chemical awareness	There is not knowledge of the (sometimes hazardous) properties of the chemicals used	Through a chemical awareness plan, detailed knowledge of the properties of chemicals used, safe handling procedures and mitigation measures in case of calamities will be provided
Detailed quantitative DDT contamination will be identified	Currently only spot checks are available	All DDT contamination will be exactly mapped out so that cleaning effort may be undertaken
A demonstration clean-up will be conducted	There is currently no knowledge in Mauritius how to conduct environmental clean-ups	Through the conduction of a demonstration cleanup of one of the DDT contaminated sited, local capacity on environmental cleanups will be created. This will be enforced through the previously mentioned chemical awareness program
Existing stockpiles of POPs will be removed or rearranged in a safe way	There is minor, spotted inventory of contaminated transformers and POPs pesticides. There is major, badly maintained, DDT inventory	PCB and pesticides inventories will be collected and disposed of. DDT inventory will be partly sold off through the WHO. The remainder will be repacked and restocked until further use is deemed unnecessary and then also sold or otherwise disposed of
Regular framework	Mauritius has existing legislation but mostly not specifically geared towards POPs management	Current regulations will be analyzed and proposals for improvement will be formulated
Project management	While capable to project management, there is currently no suitable project management structure	An efficient project implementation structure will be set up, providing also future environmental management capacities



Without this GEF-assisted project, the actions proposed most likely would never be undertaken. The project and the requested GEF funding will work as a catalyst for the creation of adequate local environmental capacities and the application of these to proper POPs management.

#### **(iv) Outcomes, Outputs and Activities**

Upon completion, the project is expected to result in the following outcomes:

1. A suitable legal and enforcement structure to sustain the outcomes of the project in the future
2. A comprehensive awareness and responsible care program to make importers, distributors, users and the general public aware of the risks involved in the use of chemicals in general and POPs specifically
3. An effective non-DDT based vector control program that will limit the chance of importing malaria and can deal with possible outbreaks
4. Removal and disposal of all obsolete POPs chemicals
5. Removal and disposal of the few remaining transformers that have PCB containing oils that exceed international standards
6. Remediation of all POPs infested sites that exceed internationally acceptable standards

Related to these expected outcomes, following outputs are expected:

7. Disposal plans will be prepared for all identified POP-Ps containing stockpiles;
8. Rehabilitation plans will be prepared for each identified POP-Ps contaminated site;
9. Pilot remediation will be conducted to allow stakeholders to gain valuable knowledge and experience;
10. Remediation of other sites will be conducted using acquired local capacity and expertise through counterpart funding.
11. Together with industry and agricultural associations a “Responsible Care” program will be implemented and maintained through recurrent training;
12. The existing regulatory framework will be reviewed and, where applicable, adapted.

To achieve the mentioned outcomes, Mauritius will, besides acquiring the necessary expertise from national and international experts, set up a Project Management Unit and expand on capacities that have been developed during the NIP preparation process.

As the project themes are relatively independent, project logical frameworks has been implemented in separate descriptions (Annex-1, -2) rather than inclusion in the general part of the project description.

#### **c) SUSTAINABILITY (INCLUDING FINANCIAL SUSTAINABILITY)**

There has been no importation of POPs pesticides in Mauritius since the early 80’s and of PCBs since 2004. There is still use of DDT in malaria vector control and of PCBs in a limited amount of transformers. Therefore, once these remaining uses have been eliminated, existing stockpiles have been discarded, contaminated sites treated and proper regulations and awareness put in place, the global environmental benefits can be sustained. The objective of this project is to create those conditions.

The private sector plays a significant role through the country’s large tourism industry which has a stake in reducing the risk of vector-borne diseases on the islands. It also plays a role through the country’s agricultural activities. MSIRI has successfully introduced biological pest control that uses virtually no insecticides (herbicides are still in use) —and certainly no POPs—in sugar cane cultivation.

Thus, sustainability effectively relates specifically to the ability of the Government of Mauritius to sustain the capacity developed under the project to address enforcement, specifically related to possible importation of illegal chemicals and through a meaningful sustainable care program. Proper enforcement will require more efforts and coordination than currently in place. While most ministries do not deal at all

with POPs related enforcement, the MOE and the MOH do have a very direct interest in the subject, but both approach this from different viewpoints. The interest of MOH is malaria control while MOE is focused on local and global environmental effects. These Ministries need to come to an agreement in their focus to allow proper enforcement. The UNDP will have an important supervisory role in ensuring that such an agreement will be reached and maintained.

The Government of Mauritius has stated its full commitment to sustainable elimination of POPs from the environment, as demonstrated by its ratification of the Stockholm Convention and its proactive role in passing the necessary legislation. At present, there are two pieces of legislation which are directly related to the 12 Persistent Organic Pollutants listed in the Stockholm Convention, the main one being the Dangerous Chemicals Control Act 2004 and the other one is the Environment Protection Act 2002. A third one is closely related to the POPs issues: the Food Act 1998. Details are offered in annex 5.

This project will assist the government in eliminating the mentioned barriers that prevent full implementation of current legislative and regulatory instruments.

#### **d) REPLICABILITY**

Potential for replication is specifically seen in the piloted DDT-free IVM strategy. Even though the epidemiological situation of malaria is unique on the islands, the vector ecology and conditions for vector breeding are not atypical for malaria-endemic countries in the region. Therefore, demonstration of a decentralized strategy of vector management emphasizing environmental methods and community participation is expected to provide an important example to other countries in terms of the potential effect on vector populations and people's awareness. In malaria endemic countries, this strategy could be complemented with other methods, for example insecticide-treated bed net programs. There is an urgent need for examples to show that communities and other local partners can take responsibility over malaria vector control activities in their own environments, as reflected in the recommendations of the DDT Expert Group (Nov 2006).

The results in Mauritius could be replicated in other small-island states and are expected to have an important example function for larger countries in Sub-Saharan Africa, MENA and Asia that are currently in the process of developing IVM strategies. On the other side, Mauritius will closely follow existing regional malaria vector control programs in Africa and Central America.

It is thought that the "good practices" training for chemical handling, closely related to amended laws on chemical handling and use and including POPs, will be of interest to other islands as well

#### **e) STAKEHOLDERS INVOLVEMENT**

Primary stakeholder in this project is the general population. In 1867 the population of Mauritius was decimated by 12-25 % through a malaria outbreak. There is still lingering public anxiety on malaria.

The industry has a stake in the project because it will no longer be able to use chemicals classified as POPs. They will be the main stakeholders in a chemical awareness plan that will increase sensitivity to what chemicals are used and their impact on health, safety and environment. The Central Electricity Board (CEB) is particularly involved as it still has minor use of PCBs. As mentioned before, the tourism industry has also a stake in reducing the risk of vector-borne diseases on the islands.

In the Government, MOE and MOH are major stakeholders. Other government stakeholders are:

- The Ministry of Public Utilities
- The Ministry of Local Government and Solid Waste Management

- The Ministry of Agro-Industry & Fisheries
- The Port Master

The NIP document (pages 47/48; 125/126) provides more details on the responsibilities of the different Ministries, Agencies and institutions involved in POPs life cycles.

Sofar, NGOs have not been strongly involved in POPs activities. This is changing. The Mauritius Council of Social Services (MACOSS), an umbrella organization of NGOs operating in Mauritius, has shown interest in an awareness program for its members. Associations with potential interest in POPs activities are “Croplife Mauritius”, a federation of private agro-chemical companies, promoting sustainable agriculture chemical safety and development and “APEXHOM”, an association of producers and exporters of horticultural products in Mauritius, which is currently implementing a project on “Minimization and Safe Disposal of Pesticide Waste”, funded under the GEF-SGP. The organization intends to compile an inventory of obsolete non-POPs pesticides in Mauritius. There may be synergies with this MSP in inventory and disposal activities.

#### f) MONITORING AND EVALUATION

See **Annex-4** for a detailed Monitoring and Evaluation plan and budget.

The main monitoring unit will be a standing Project Steering Committee (SC) that includes government representatives, UNDP and relevant industry/NGO representation (see annex-3 for details). It will meet bi-annually to review project progress, provide strategic guidance, and approve annual work plans and budgets. Monitoring of project activities will also be conducted through periodic reports as per applicable GEF and UNDP guidelines—specifically through the Project Implementation Review (PIR) exercise for GEF. The PIR will be shared with project stakeholders through a tripartite review process. These reports will be distributed to the Project Steering Committee and directly to funding agencies upon request.

### 4. FINANCING (FINANCING PLAN, COST EFFECTIVENESS, CO-FINANCING, CO-FINANCIERS)

#### a) PROJECT COSTS

##### **THEME-1 - Disposal of obsolete POPs chemicals/decontamination of POPs-infested areas**

Project Components/Outcomes	GEF (\$)	Co-financing (\$)	Total (\$)
1. Evaluation and safeguarding	85,000	20,000	105,000
2. Disposal of obsolete POPs inventories	65,000	60,000	125,000
3. Remediation of contaminated areas*	115,000	70,000	185,000
4. “Responsible Care” program	115,000	60,000	175,000
5. Monitoring/Evaluation	20,000	20,000	40,000
<b>Task-1 total project costs</b>	<b>400,000</b>	<b>230,000</b>	<b>630,000</b>

\* This GEF funding includes only capacity building measures

##### **THEME-2 - Development of Alternative Strategies for Malaria Vector Management**

Project Components/Outcomes	GEF (\$)	Co-financing (\$)	Total (\$)
1. Continued DDT evaluation	35,550	100,000	135,550
2. Surveillance and monitoring	164,950	180,000	344,950
3. IVM strategy	145,650	210,000	355,650
4. IVM Demonstration	121,150	50,000	171,150
5. Monitoring, impact assessment	34,950	160,000	194,950
<b>Task-2 total project costs</b>	<b>502,250</b>	<b>700,000</b>	<b>1,202,250</b>
<b>Total Project Costs for both Tasks</b>	<b>902,250</b>	<b>930,000</b>	<b>1,832,250</b>

**b) PROJECT MANAGEMENT BUDGET/COST**

**THEME-1**

Component	Estimated staff-weeks	GEF(\$)	Other sources (\$)	Project total (\$)
Personnel	100	30,000	0	30,000
Local consultants	0	0	0	0
International consultants	0	0	0	0
Office facilities, equipment, vehicles and communications	n/a	0	15,000	15,000
Travel		2,000	3,000	5,000
Miscellaneous (evaluations, audits)		5,000	5,000	10,000
<b>Total</b>	<b>100</b>	<b>37,000</b>	<b>23,000</b>	<b>60,000</b>

**THEME-2**

Component	Estimated staff-weeks	GEF(\$)	Other sources (\$)	Project total (\$)
Personnel	100	30,000	0	30,000
Local consultants	2	1,500	0	1,500
International consultants	0	0	0	0
Office facilities, equipment, vehicles and communications	n/a	15,000	60,000	75,000
Travel		2,000	3,000	5,000
Miscellaneous (evaluations, audits)		5,000	5,000	10,000
<b>Total</b>		<b>53,500</b>	<b>68,000</b>	<b>121,500</b>
<b>Grand Total</b>	<b>102</b>	<b>90,500</b>	<b>91,000</b>	<b>181,500</b>

**c) CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

**THEME-1**

Component	Estimated staff weeks	GEF(\$)	Other sources (\$)	Project total (\$)
Personnel	700	43,000	167,000	210,000
Local consultants	80	60,000	0	60,000
International consultants	42	105,000	0	105,000
<b>Total</b>	<b>822</b>	<b>208,000</b>	<b>167,000</b>	<b>375,000</b>

**THEME-2**

Component	Estimated staff weeks	GEF(\$)	Other sources (\$)	Project total (\$)
Personnel	2,000	40,000	560,000	600,000
Local consultants	200	150,000	0	150,000
International consultants	70	175,000	0	175,000
<b>Total</b>	<b>2,270</b>	<b>365,000</b>	<b>560,000</b>	<b>925,000</b>
<b>Grand Total</b>	<b>3,092</b>	<b>573,000</b>	<b>727,000</b>	<b>1,300,000</b>

**d) CO-FINANCING SOURCES**

Name of co-financier (source)	Classification	Type	Amount (\$)	Status	
				Confirmed	Unconfirmed
MOE, MOH	Government	Cash	720,000	X	
		In kind	180,000	X	
	Industry Associations	Cash	30,000	X	
<b>Sub-total co-financing</b>			<b>930,000</b>	<b>X</b>	

Note: Due to a different definition of the notions of “cash” and “in kind”, the Government has indicated in their letters all their contributions as “in kind” while in fact the above-mentioned activities clearly shows them to be “in cash” with budgets existing to cover the expenditures indicated above. The confusion arose as it was believed that “in cash” would mean that funds would be channeled through UNDP (which is not the case). Further information can be found in attachment “A”.

It is also referred to the task-specific financial plans that have been included in Annex-1 and -2.

### e) COST-EFFECTIVENESS

The GEF guidance document on cost-effectiveness offers a quantitative approach and a qualitative approach. It has been attempted here to determine a quantitative cost-effectiveness (CE) with standards derived from comparable projects. While not ideal because (i) such a comparison does not take into account special circumstances, (ii) comparative information is based on just one POPs chemical (PCB) and (iii) the relatively low amount and imprecision of available information from other projects, it would at least encourage in-depth analysis in case there is significant deviation from the average. Following comparison could be made (total project costs divided by POPs t (rounded) from the scant information:

<u>Country</u>	<u>CE (US\$/kg POPs)*</u>	<u>CE (US\$/kg POPs) **</u>
Ghana	16	37
Kyrgyzstan	14	29
Latvia	11	30
Mauritius	8	16

\* based on requested GEF grant; \*\* based on total project cost

This—very indicative—comparison shows that the project measures very well in total as well as in GEF grant cost-effectiveness. It compares also well with cost-effectiveness standards used for GEF ODS phaseout projects (7 – 17 US\$/kg ODP).

## 5. INSTITUTIONAL COORDINATION AND SUPPORT

### a. CORE COMMITMENTS AND LINKAGES

The project is linked with the GEF funded Project Initiation Document (PDF-A) “Sustainable Management of POPs in Mauritius” as well with the “National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants” in which the main components posed actions were identified and prioritized.

The Malaria Vector Control part will relate to three regional malaria vector control projects (Africa, Central America and MENA). However, it should be recognized that the situation in Mauritius is different, because malaria is imported and recently rare because of a thorough system of malaria case management and because of existing (DDT-based) vector control at air/sea ports. Nevertheless, there will be certainly a need to share experiences and lessons learnt between projects tackling similar issues.

The Government of Mauritius did also consider a linkage to the African Stockpile Project for disposing its stockpile of DDT. However, the ASP approach was considered too far reaching for the local circumstances as pesticide stockpiles are relatively minor in Mauritius. Obsolete pesticides (including POPs) are not accumulated in large amounts. The DDT stockpile was donated in the early 1980’s by WHO and due to a miscalculation as well as changes in use it has remained there ever since. Therefore the ASP emphasis on re-accumulation is not applicable, However for awareness-raising activities the program may be consulted.

For the PCB disposal component, the project will seek a non-combustion solution if available and feasible. For this part information from other projects and UNEP's "Survey of Currently Available Non-incineration PCB Destruction Technologies" will be consulted.

UNIDO's future efforts in Ghana & Nigeria related to contaminated sites will also be taken into account and lessons learned from each other's projects will be shared.

### **Link with SAICM**

The "Responsible Care" Program component of the project - whose focus will be to build capacity on a) understanding the character of the chemicals currently in use, b) workers protection and safety when using these chemicals, c) minimization of environmental impact, d) avoidance/minimization of obsolete stocks, and e) proper treatment of (minimized) stocks - will strengthen foundational capacities for chemicals management within the country and thereby, serve to support the GEF's strategic aim to promote the sound management of chemicals, as well as the Strategic Approach to International Chemicals Management (SAICM). SAICM, adopted in February 2006, supports the achievement of the WSSD Johannesburg Plan of Implementation goal that seeks to ensure that, by the year 2020, chemicals are produced and used in ways that minimize significant adverse impacts on the environment and human health.

Given its focus, the results of the "Responsible Care" component may also allow the country, in future, to develop a project for submission to the SAICM Quick Start Programme, whose objective it is to "support initial enabling capacity building and implementation activities in developing countries, least developed countries, small island developing States and countries with economies in transition". By its very nature, the "Responsible Care" program calls for adoption of an integrated approach and thereby, will serve to lay the groundwork in assisting Mauritius to develop or update its national chemicals profile, while also identifying of its capacity needs with respect to for sound management of chemicals. In turn, this will serve to enhance synergies amongst the other international chemicals-related agreements and initiatives that Mauritius implements.

### **b. CONSULTATION, COORDINATION AND COLLABORATION BETWEEN IAS, AND IAS AND ExAs, IF APPROPRIATE.**

Because of the linkages mentioned, there is a need for close cooperation with WHO and UNEP. There may be other, more technical cooperation emerge during the project implementation.

### **c. PROJECT IMPLEMENTATION ARRANGEMENTS**

The project will be implemented through National Execution (NEX). It will be executed, under guidance and supervision by the UNDP Country Office, by the Government of Mauritius, Ministry of Environment and National Developing Unit (MOE), which will also be the lead Agency for Task-1. The Ministry of Health and Quality of Life (MOH) will be the lead agency for Task-2. Further details are provided in **Annex-3**.

## **6. REQUIRED ATTACHMENTS**

- |  |                |
|--|----------------|
| A. Endorsement and Confirmation letters of commitments | attached       |
| B. Report on the Use of Project Preparation Grant      | attached       |
| C. Agency Notification on Major Amendment              | not applicable |

## **7. ANNEXES**

<b>Annex-1</b>	Theme 1 - Disposal of obsolete POPs chemicals and decontamination of POPs-infested areas
<b>Annex-2</b>	Theme 2 - Development and Demonstration of Alternative Strategies for Malaria Vector Management
<b>Annex-3</b>	Project Implementation Framework
<b>Annex-4</b>	Monitoring and Evaluation Plan and Budget
<b>Annex-5</b>	Environment Protection Act (EPA) 2002
<b>Annex-6</b>	List of Abbreviations

## **PART III – RESPONSE TO PROJECT REVIEW**

- a) Convention Secretariat comments and IA/ExA response
- b) STAP expert review and IA/ExA response (if requested)
- c) GEF Secretariat and other Agencies' comments and IA/ExA response

## ATTACHMENT-A COMMITMENT/CO-FINANCING LETTERS

Notes:

- Due to a different definition of the notions of “cash” and “in kind”, the Government has indicated in their letters all their contributions as “in kind” while in fact the activities mentioned for co-financing clearly shows them to be “in cash” with budgets existing to cover the expenditures indicated above. The confusion arose as it was believed that “in cash” would mean that funds would be channeled through UNDP (which is not the case).
- During the final discussion with the Government, following requirements for co-financing were presented.

Components/Outcomes	Co-financing	MOE	MOH	Others
1. Evaluation/safeguarding	20,000	10,000	10,000	0
2. Disposal of POPs	60,000	60,000	0	0
3. Clean-ups	70,000	35,000	35,000	0
4. “Responsible Care”	60,000	20,000	10,000	30,000
5. Monitoring/Evaluation	20,000	20,000	0	0
<b>Total Theme-1</b>	<b>220,000</b>	<b>145,000</b>	<b>55,000</b>	<b>30,000</b>
1.DDT evaluation	100,000	0	100,000	0
2. Surveillance/monitoring	180,000	0	180,000	0
3. IVM strategy	210,000	0	210,000	0
4. IVM Demonstration	50,000	0	50,000	0
5. Monitoring, assessment	160,000	0	160,000	0
<b>Total Theme-2</b>	<b>700,000</b>	<b>0</b>	<b>700,000</b>	<b>0</b>
<b>Total Project Co-funding</b>	<b>930,000</b>	<b>145,000</b>	<b>755,000</b>	<b>30,000</b>

Details per Theme were provided as follows:

<b>MOE:</b>	Project Coordinator with Office Assistance	US\$ 110,000
	Assistance in responsible care program	US\$ 20,000
	Office Facilities	US\$ 15,000
	<b>Total</b>	<b>US 145,000</b>
<b>MOH:</b>	Assistance in DDT Safeguarding	US\$ 10,000
	Assistance in DDT Soil Cleanup	US\$ 45,000
	<b>Total</b>	<b>US\$ 55,000</b>
<b>OTHERS:</b>	Assistance in “Responsible Care” Program	US\$ 30,000
	<b>Total</b>	<b>US\$ 30,000</b>
<b>TOTAL CO-FUNDING THEME-1</b>		<b>US\$ 230,000</b>

**Sources for Co-Financing Theme-2**

<b>MOE:</b>	No Requirements	US\$ 0
<b>MOH:</b>	Can use from Chikungunya Funds	
	(applicable up to MUR 49 mio = ~US\$ 1,600,000)	US\$ 700,000
<b>OTHERS:</b>	No Requirements	US\$ 0
<b>TOTAL CO-FUNDING THEME-2</b>		<b>US\$ 700,000</b>

**GRAND TOTAL CO-FUNDING** **US\$ 930,000**

- In the co-financing confirmation process, the different stakeholders got a bit confused about the required amounts:
  - The industry pledged a total of US\$ 99,000, from which US\$ 32,000 in cash (CEB) and US\$ 69,000 in kind (APEXHOM)
  - MOE pledged US\$ 220,000, based on the understanding that it should guarantee the entire co-financing for them-1
  - MOH stated that from the chikungunya budget (US 1,800,000 in 2007 and similar expected for the next 3 years) US\$ 1,600,000 could be considered for vector control—by far exceeding required US\$ 755,000.

The total co-financing assured exceeds therefore the required amount by a significant margin.





V/F

## MINISTRY OF FINANCE AND ECONOMIC DEVELOPMENT

Government Centre, Port Louis, Mauritius

### Endorsement Letter

*In reply please quote*  
TA/20/4/13/6 V 7

19 June 2007

**Ms Monique Barbut**  
**CEO and Chairperson**  
**Global Environment Facility**  
**1818 H Street, NW**  
**Washington, DC 20433**  
**USA**

Dear Madam

#### *UNDP/GEF- Sustainable Management of POPs – Phase 1*

As you may be aware, Mauritius completed its National Implementation Plan (NIP) in June 2005. The NIP recommends priority actions to address obsolete POPs chemicals and de-contamination of POPs-infested sites, including DDT and to gradually phase out DDT as a means of vector control.

2. In this context, the Government of Mauritius is endorsing the “Sustainable Management of POPs” project. You will find enclosed, herewith, the letters of co-financing commitments from the Ministry of Health & Quality of Life, the Ministry of Environment & NDU and the APEXHOM, which is an NGO, intensively involved in removal of pesticide waste in Mauritius.

3. We look forward for your kind consideration in this matter.

Regards

Yours sincerely,

**A. Rajabalee**  
**for Financial Secretary**  
**& GEF Operational Focal Point**

*Copy: The Resident Representative, UNDP Office, Anglo Mauritius House, Port Louis, Mauritius ✓*

# GOVERNMENT OF MAURITIUS

MY REF: ENV/GEF/UNDP/POP/19

YOUR REF:

Date: 14 June 2007

From : Permanent Secretary, Ministry of Environment & NDU  
To : Financial Secretary, Ministry of Finance & Economic Development  
(Attn: Mrs. R. Ramisara)

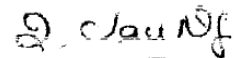
**SUBJECT: UNDP/GEF Sustainable Management of POPs project- Endorsement letter for MSP proposal**

We refer to the above project.

2. We wish to inform you that the Ministry of Environment & NDU is fully agreeable to the MSP proposal.

3. The total cost estimate for the implementation of the project is US\$ 1 802 250. The total co-funding to be provided by this Ministry together with the CEB as per the MSP for Task-1 amounts to US\$ 220,000 and would be provided in-kind through Government staff inputs, office facilities, local travel and other logistics.

4. Thanking you for your usual collaboration.



D. Lan Ng (Mrs)  
Director, Department of Environment  
For Permanent Secretary

No. RB/8507

14 June 2007

**The Director  
Department of Environment  
Ministry of Environment & NDU  
Ken Lee Tower, Port-Louis**

Dear Sir/Madam,

**Co-Financing letter for UNDP/GEF PDFA Sustainable Management of POPs**

Apexhom wishes to express its interest in co-financing the UNDP-GEF Medium Sized project "Sustainable Management of POPs project" for Mauritius.

This project is very relevant to our organisation and ties in and complements some of our activities already underway, notably under the Project on Minimisation and Safe Disposal of Pesticide Waste, funded by the GEF Small Grants Programme implemented by the UNDP.

We therefore subscribe to the objectives and outcomes of the UNDP-GEF PDFA Sustainable Management of POPs project, and agree to endorse co-financing (in-kind contribution) for the project for an estimated total amount of US\$ 69,000 (Sixty-nine thousand US dollars). In-kind contribution mainly involves activities under Theme 1 - Disposal of Obsolete POPs Chemicals and Decontamination of POPs-infested areas, especially under Output 4 - Institution of a "Responsible Care" Programme (see annex).

Please note that Apexhom will prepare and disseminate electronic newsletters for information dissemination of project activities. This can be considered as a sensitisation and training activity. This activity, although not specifically mentioned in the project document, is of great importance and will lead to smooth and successful project implementation.

With best regards,

Yours faithfully,



**Ratfa Bundhva  
Secretary General**

Association Professionnelle  
des Producteurs / Exportateurs  
de Produits Horticoles de Maurice

cc. The Financial Secretary, Ministry of Finance (Att. Mrs. R. Ramsum)

B. P. 1197 Port Louis  
Avenue Mahatma Gandhi, Moka  
Ile Maurice.  
Tel: (230) 433 4886  
Fax: (230) 433 4887  
Email: apexhom@mtat.mu  
www.apexhom.org.mu

**In-kind contribution from Apexhom under UNDP-GEF Medium Sized project  
"Sustainable Management of POPs project" for Mauritius.**

<b>Activity No.</b>	<b>Type of contribution</b>	<b>In-kind contribution (US\$)</b>
4.1.	Expert for training needs analysis	3,750
4.2.	Expert for preparation of training material	1,500
	Office equipment for preparation of electronic newsletters (computer, printer, internet access)	1,500
4.3.	Expert for training	7,500
	Expert for elaboration and dissemination of information on project activities and POPs-related subject through electronic newsletter	45,000
	Training equipment	3,750
	<b>TOTAL</b>	<b>69,000</b>

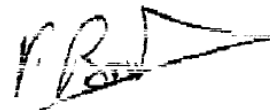
**MHO/ENV/UNEP**

**14 June 2007**

**Senior Chief Executive, Ministry of Health and Quality of Life  
Financial Secretary, Ministry of Finance & Economic Development**

**UNDP/GEF/PDFA Sustainable Management of POPs Project - Endorsement  
Letter**

With reference to letter dated 12 June 2007 from the Ministry of Environment & NDU (copy enclosed), I am directed to inform you that the Ministry of Health & Quality of Life is agreeable, in principle, to endorse and co-finance the project in kind.



**(V. Hoodhoo)  
for Senior Chief Executive**

**COPY TO: PS, Ministry of Environment & NDU (ATT: Mr R. Seenauth) ✓**

GOVERNMENT OF MAURITIUS

MY REF. MHO/ENV/UNEP

YOUR REF:

Date: 15 June 2007

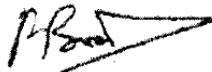
From: Senior Chief Executive, Ministry of Health & Quality of Life

To: Financial Secretary

Co-financing of UNDP – GEF PDEA  
Sustainable Management of Pops Project

Further to our letter dated 14 June in connection with above, please find enclosed a breakdown of annual cost incurred directly in Vector control activities

2. Most of the activities overlap both for Malaria and Chikungunya, with the exception of fogging operations.
3. After extracting cost for equipment and insecticides utilised in fogging operations, an estimated amount of Rs 49 m, could be considered as being cost incurred directly in vector control activities for Malaria annually.
4. In addition, laboratory space and supportive office space are already available.



(V. Boodhna)  
for Senior Chief Executive

Copy to: Permanent Secretary, Ministry of Environment & NDU  
(Attn: Mr R. Seemath)

**COMMUNICABLE DISEASES CONTROL UNIT**  
**ESTIMATES FOR VECTOR CONTROL AND SURVEILLANCE**  
**OUTSIDE ALERT**

**HUMAN RESOURCES**

WORKERS	NUMBER	COST (RS)
TIME KEEPERS	15	2,430,000
GANGMAN	13	1,560,000
SPRAYERMAN	111	11,721,600
DRIVERS	19	1,824,000
HEALTH SURVILLANCE OFFICERS	49	7,467,000
<b>TOTAL</b>	-	<b>24,002,600</b>

**LOGISTICS**

VEHICLE	NUMBER	COSTS (RS)
LORRIES	15	15,000,000
VANS	4	3,200,000
DIESEL	103,200 ltrs	2,992,800
<b>TOTAL</b>	-	<b>21,192,800</b>

**EQUIPMENT (IN USE)**

VEHICLE	NUMBER	COSTS (RS)
SPRAYERS	111	1,332,000
FOGGING MACHINES	56	1,568,000
PROTECTIVE EQUIPMENT	140	677,000
LADDERS	32	320,000
<b>TOTAL</b>	-	<b>3,897,000</b>

**INSECTICIDES**

INSECTICIDES	QUANTITY	COSTS
AQUA - K - OTHRINE	200 ltrs	492,000
ABATE	500 ltrs	300,000
CARRIER SOLUTION	3000 ltrs	252,000
DDT	1000 kg	600,000
KEROSENE	6,600 ltrs	210,000
<b>TOTAL</b>	-	<b>1,854,000</b>

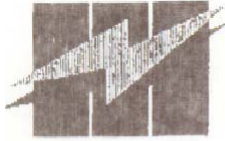
15.06.07

# COMMUNICABLE DISEASES CONTROL UNIT

## ESTIMATES FOR VECTOR CONTROL AND SURVEILLANCE OUTSIDE ALERT

ITEMS	COSTS
HUMAN RESOURCES	25,002,600
LOGISTICS	21,192,800
EQUIPMENT	3,597,000
INSECTICIDES	1,854,000
TOTAL	51,946,400





REPLY TO BE ADDRESSED TO UNDERSIGNED

# Central Electricity Board

P.O. Box 40 - Royal Road - Curepipe  
MAURITIUS

TEL. NO. 801 1100 / 876 6010  
TELEFAX NO. (230) 875 7958 / 7959  
E-MAIL : ccb@inet.mu  
W. SITE : ccb.inet.mu  
VAT Reg No. VAT22000591

OUR REF : **CA/SS**

22 June 2007

YOUR REF

The Permanent Secretary,  
Ministry of Environment & National Development Unit  
Department of Environment  
10<sup>th</sup> Floor, Ken Lee Tower  
Cnr Barracks & St Georges St  
**Port Louis**

**Attn: Mr. R. Seenauth, Environment Officer**

Dear Sir,

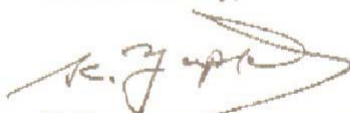
## **Medium Size Project on Sustainable Management of POP's funded by the GEF**

We refer to the above Project and we wish to inform you that the Central Electricity Board is fully committed to cooperate with the Ministry of Environment and NDU to manage and get the country rid of POPs, particularly PCB's, which are presently under the custody of the CEB. We are fully agreeable to the MSP proposal.

The five transformers that have been found to be PCB contaminated during the inventory carried out during NIP activities have already been replaced by new non-PCB ones at the cost of about 32,000 \$ (Rs. 1,000,000). The total cost of the replacement has been fully taken care by CEB. The contaminated transformers are properly stored at the premises of CEB waiting to be disposed of as per recommendation that would be proposed by the Ministry of Environment and NDU.

We thank you for your support and collaboration in this activity and would be pleased to provide with any additional information that you may require.

Yours faithfully,

  
**K. Gupta**  
**General Manager**

ATTACHMENT-B



**PDF IMPLEMENTATION REPORT**



**GEFSEC PROJECT ID:** n/k  
**UNDP PROJECT ID:** PIMS No 3779  
**COUNTRY:** Mauritius  
**PROJECT TITLE:** 'Sustainable Management of POPs in Mauritius'  
**OTHER PROJECT EXECUTING AGENCY(IES):** Ministry of Environment  
**GEF FOCAL AREA:** Persistent Organic Pollutants  
**GEF OPERATIONAL PROGRAM:** OP-14  
**STARTING DATE:** October 2006  
**ESTIMATED DATE OF OPERATIONAL CLOSURE:** JULY 2007  
**ESTIMATED DATE OF FINANCIAL CLOSURE:** JULY 2007

**Report submitted by:**

<b>Name</b>	<b>Title</b>	<b>Date</b>
<u>Yosuke Fukushima</u>	<u>Environment Programme Officer</u>	<u>04/06/2007</u>

## **PART I - PROJECT ACHIEVEMENTS**

### **A- SUMMARY OF ACTUAL ACHIEVEMENTS OF PREPARATORY PHASE (OUTPUTS AND OUTCOMES), AND EXPLANATION OF ANY DEVIATIONS FROM EXPECTED OUTCOMES**

The Government of Mauritius has developed a National Implementation Plan (NIP) on Persistent Organic Pollutants, with assistance of GEF and UNDP. The National Implementation Plan includes a situational analysis of POPs issues in Mauritius. This analysis and related initial POPs surveys provide the background from which national priorities and NIP action plans were agreed upon. The NIP further outlines a number of priority interventions. From these, a number of themes emerge and it was agreed that the first capacity building efforts for the management of POPs in Mauritius will be concentrated around these themes. Identified priorities for POPs themes are:

1. POPs waste and contamination.
2. Switch to non-POPs pesticides for malaria vector control.
3. Medical waste management.
4. Research into PCCD/Fs' emissions from bagasse burning/monitoring and analysis of POPs.

A PDF-A was granted to develop an MSP covering the first two themes. Following actions were identified for this purpose:

#### Priority theme 1

- Preparation and completion of the legal framework for covering legal gaps between national legislation and Stockholm Convention as identified in the NIP.
- Raising awareness of POPs and their effects among target groups and general public.
- Safe management of PCB contaminated transformers through education, risk communication, setting-up separate management for PCB contaminated transformers.
- Finalize PCB inventory equipment by equipment and identify potential additional sources
- Draining, washing and re-filling PCB contaminated transformers.
- Disposal of PCB oils (and potentially highly contaminated soils) abroad.
- Collection and re-packing of minor quantities of POPs pesticides (and other banned pesticides) at private distributors etc.
- Clean-up of DDT contamination at Fort Georges, Mahebourg Hospital and Pamplemousses .
- Remediate (excavate and dispose at Mare Chicose landfill site) DDT contaminated soils from Fort Georges, Mahebourg and Pamplemousses storage sites.
- Disposal of the DDT stockpile and associated waste abroad.

#### Priority theme 2

- Assessing the malaria and vector control situation in Mauritius.
- Ensuring safe handling and storage of remaining DDT stockpile.
- Familiarization of officials with non-POPs alternative malaria management.
- Training in use of selected malaria management alternatives.
- Field-testing at preventive spraying sites.
- Setting-up efficacy and resistance monitoring for selected alternatives.
- Switching to non-POPs alternative once confidence in new approach is obtained.

To facilitate these actions, a national and an international expert were retained for each theme. In October 2006 an international mission, including all retained experts was arranged during which existing information was reviewed, additional information collected and a preliminary draft MSP, based on these

inputs, was prepared. This draft has been further completed and converted into the new GEF format. After completion of the draft May 2007, a second mission for the Theme-1 international expert—who acted as team leader—was arranged to discuss this document with stakeholders through the Local Project Appraisal Committee and on-to one- discussions with MOE/MOH. This mission took place early June 2007 and resulted in a final draft MSP which was submitted to UNDP June 11. With this submission, the activities under this PDF-A are completed as the following table shows:

**Table 1: Completion status of Project Activities**

Approved (US\$)			Actual (US\$)			
Proposed Activities at Approval	GEF financing	Co-financing	Completion status	GEF financing	Co-financing	Uncommitted GEF funds
Preparation of MSP Phase-I	48,000	5,000	Completed	48,000	10,140	

There have been no major deviations of the tasks identified in the PDF-A. .

### **B – Record of Stakeholder Involvement in project preparation**

All identified stakeholders were consulted throughout project development. During both missions, national and international experts held meetings with these stakeholders, assembled through a Local Project Appraisal Committee to disclose and validate findings and discuss project strategy. During the workshops all stakeholders received a full copy of the draft MSP and had the opportunity of offering opinions and suggestions. This input has been reflected in the final version of the MSP, Theme-I.

Following entities participated:

- The Ministry of Environment and NDU
- The Ministry of Health and Quality of Life
- The Ministry of Public Utilities
- The Central Electricity Board
- The Ministry of Local Government
- The Ministry of Agro Industries and Fisheries
- The Ministry of Finance and Economic Development (Finance division)
- The Ministry of Labour, IR & E
- The Police Force
- The Fire Services
- The Mauritius Sugar Industry Research Institute
- NGOs representing industry and Agriculture

**PART II - PDF financial delivery**

**TABLE 2 – PDF INPUT BUDGET – APPROVALS AND COMMENTS**

<i>Input Description*</i>	<i>Approved</i>			<i>Committed</i>		
	<i>Staff weeks</i>	<i>GEF funds</i>	<i>Co-finance</i>	<i>Staff weeks</i>	<i>GEF funds</i>	<i>Co-finance</i>
<b><i>Personnel</i></b>	7	-	5,000	10		7,440
<b><i>Local consultants</i></b>	24	17,000	-	24	14,665	-
<b><i>Intl consultants</i></b>	6	16,000	-	6	22,220	-
Training			-			-
Travel		12,000	-		6,997	-
Office equipment			-			-
Miscellaneous		3,000	-		4,118	2,700
<b>Total</b>		<b>48,000</b>	<b>5,000</b>		<b>48,000</b>	<b>10,140</b>

**Additional relevant information:**

The international expert allocation has been overspent due to need to reformat the MSP-document to meet new GEF requirements as well as a second mission of the team leader to present the final document and arrange co-financing.

**TABLE 3: ACTUAL PDF CO-FINANCING**

<b>Co-financing Sources for Project Development Preparation (PDF)</b>				
Name of Co-financier (source)	Classification	Type	Amount	
			Expected (\$)	Actual (\$)
Ministry of Environment	Exec. Agency	In-kind	5,000	10,140
Total co-financing			5,000	10,140

**Additional relevant information:**

The following calculation has been used to determine the actual co-financing:

- Assumptions:
- One MOE official has devoted one day/week (1/5 of his time) for the last 12 months preparing and executing this project
  - His salary is US\$ 1,000/month
  - Salary related costs (insurance, pension) are 55%
  - Overhead costs on top of this (office, secretary and transportation) are 100 %

Calculation:  $1/5 \times 12 \times 1,000 \times 1.55 \times 2 = \underline{\text{US\$ 7,440}}$

In addition, there were costs for three meetings of the steering committee; assumed to be (US\$ 900/meeting; 36 attendants@ US\$ 50 and 3 meetings) US\$ 2,700.

## ANNEX-1

### **Theme-1: Disposal of obsolete POPs chemicals and decontamination of POPs-infested areas**

#### **1. Introduction and Summary**

Importation of POPs chemicals is not anymore allowed in Mauritius. Remaining uses are rare, stockpiles of obsolete POPs chemicals small and confirmed contamination from POPs restricted to just three sites and limited to just one chemical (DDT).

The only currently practiced use is

- PCBs in a very limited amount of transformers, and
- DDT for malaria vector control in air- and seaports

Both users have agreed to cease this use. In the case of PCB, this can be done in a simple replacement/disposal action of the pertinent transformers but in the case of DDT, a phased alternative approach is required which will be detailed in Annex-2: "**Development and Demonstration of Alternative Strategies for Malaria Vector Management**"

This document describes

- The objective of the project
- The current ("baseline") situation
  - The location, condition and amounts of POPs chemicals
  - The location and condition of POPs-contaminated sites
- Proposed actions to centralize, stabilize and safeguard existing stockpiles and contaminated areas
- Proposed testing and verification measures in cases where existing data are deemed insufficient
- Determination of the final fate of obsolete stockpiles (disposal methods) for each type of POPs
- Disposal of all obsolete POPs chemicals
- Remediation of DDT-contaminated areas
- Introduction of a "responsible care" program for the use of hazardous chemicals

The action plan will exclude dioxins and furans as their creation in the environment of Mauritius and action plans to limit emissions will need further study.

#### **2. Objective of Theme-1**

The objective of Theme-1 is to remove POPs from the environment of Mauritius in a sustainable way through disposal of obsolete stockpiles and cleanup of POPs-infested sites while phasing out the use of POPs.

#### **3. Baseline Situation**

The use of POPs in Mauritius is rare. Importation is not anymore allowed since 2004 for PCBs and since the early 80's for POPs-Pesticides. Stockpiles of obsolete POPs chemicals are very small and confirmed site contamination from POPs is restricted to three sites, related to current and previous storage only and limited to just one chemical (DDT).

Current confirmed **POPs use** is restricted to DDT for malaria vector control in air- and seaports.

Current confirmed **Obsolete Stockpiles** are identified as follows:

**PCBs** - During the inventory of PCB containing equipment carried in 2004, only transformers and capacitors were investigated as proposed by the international consultant of the NIP project. These would be the equipment that would contain the most significant amounts of PCBs or PCB contaminated oil. For the screening and identification of PCB contaminated equipment, PCB test kits (“Chlor-N-Oil”) were used and gas chromatography / mass spectrometry (GC/MS) analyses were performed for confirmation. The Central Electricity Board (CEB), which distributes the electricity in Mauritius owns more than 99% of the transformers and capacitors in Mauritius. The inventory was carried out in close collaboration with officers of CEB.

All the capacitors owned by CEB are dry ones and are PCB free as indicated on the equipment plates. As for the capacitors owned by other companies, from information obtained/gathered during the inventory it was concluded that they were also PCB free.

The CEB owns more than 4200 transformers that are in operation in its electrical network. CEB generally purchases transformers by batch (same make and manufacturing year) consisting of about 20-50 transformers. For cost effectiveness and because of time constraint, screening was carried out on one transformer per batch using PCB test kits. The transformers that were found to be PCB contaminated, at levels exceeding 50 ppm PCB were further investigated by gas chromatography/mass spectrometry for confirmation. The findings of the inventory show that **only five transformers**, containing approximately 5 tons oils and all of the same make were contaminated:

**List of contaminated transformers – Analysis by MSIRI using GC/MS**

No	CEB code	Make	Year of manufacture	PCB /ppm
1	150DX205	NGEF (India)	1981	53.14
2	100DX120	NGEF (India)	1981	143.74
3	100DX24	NGEF (India)	?	96.65
4	150DX237	NGEF (India)?	1981	78.71
5	150DX105	?	?	99.23

(Source CEB)

Servicing and repair of transformers are performed at CEB’s St Louis workshop. From information obtained from CEB officers at the St Louis workshop only mineral oil, purchased from Shell Company, has been used since the mid 1970s for servicing or repair.

**POPs Pesticides** - According to information gathered/obtained from the Pesticides Control Board during the inventory, no POPs pesticides except DDT have been used in Mauritius since the early 1980s. Moreover, except for DDT, all POPs pesticides are banned in Mauritius. DDT is still being used in Mauritius for vector control. It is currently being sprayed twice yearly at the airport and the seaport. For this purpose, about 600 kg technical DDT is used annually. Mauritius has already applied for and has been granted exemption for use of DDT for vector control from the Stockholm Secretariat. The findings of the inventory carried out in 2004 are given in the table below

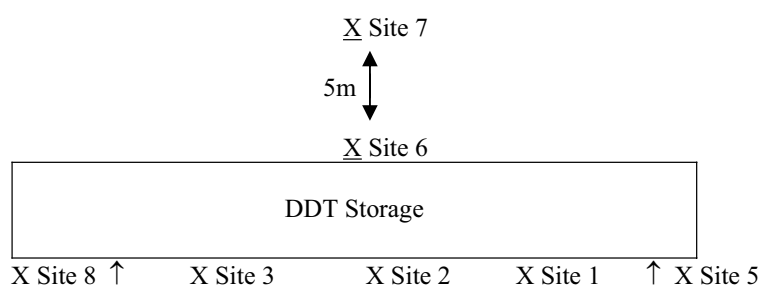
Store/site	Pesticide	Stock
Ministry of Health	DDT	116 tons
M.S.I.R.I.	Dieldrin	8 liters
Roger Fayd’Herbe	Mirex	64 kg
Deep River Beau Champ	Aldrin	13 liters

Prior to the inventory, the DDT stocks, which fall under the responsibility of the Ministry of Health, were stored at three different sites:

- Compound of community hospital at Mahebourg
- Powder Mill in Pamplemousses
- Fort George, Port Louis

Subsequently, the Ministry of Health decided to regroup all stock at one storage site. Presently, all DDT stock is stored at the Powder Mill, Pamplemousses. The storage buildings are in satisfactory conditions, properly locked, and not accessible to the public. However, the DDT stocks are not properly packaged. Many of the bags containing the DDT have suffered degradation and there are visible spills of DDT powders on the floor inside the stores and outside in the direct vicinity. To obtain an idea of the extent of contamination, spot testing was conducted at the Pamplemousses site with the following outcome:

**Soil analysis for DDT – Sampling 27/12/2006 – Powder Mill (ppm or ug/g)**



Code	Site	Depth	2,4-DDE	4,4-DDE	2,4-DDD	4,4-DDD	2,4-DDT	4,4-DDT	Σ DDT
PDFA 1	1	Topsoil	0.11	6.21	0.26	3.00	4.30	13.38	17.68
PDFA 2	1	50 cm deep	ND	0.23	ND	0.03	0.09	0.29	0.38
PDFA 3	2	Topsoil	1.76	39.70	4.70	55.87	52.93	202.89	255.82
PDFA 4	2	50 cm deep	ND	1.12	0.03	0.41	0.54	4.33	4.87
PDFA 5	3	Topsoil	4.37	76.62	9.13	75.83	76.22	234.23	310.45
PDFA 6	4	Topsoil	0.11	3.91	0.36	1.34	1.63	4.11	5.74
PDFA 7	4	50 cm deep	ND	0.07	ND	0.01	0.10	0.17	0.27
PDFA 8	5	Topsoil	22.84	627.23	45.35	900.64	1132.23	7546.05	8678.28
PDFA 9	6	Topsoil	0.02	2.84	0.04	0.51	0.89	2.05	2.94
PDFA 10	7	Topsoil	0.10	8.96	0.29	4.07	3.01	13.92	16.93
PDFA 11	8	Topsoil	0.19	13.24	1.81	15.65	14.45	50.57	65.02

The analyses indicate high levels of DDT contamination<sup>1</sup>. It is estimated that 100-150 m<sup>3</sup> of soil will need to be remedied. Expecting the same volume at the other two sites would lead to the conclusion that a total of up to 450 m<sup>3</sup> of soil needs to be removed and decontaminated.

The other POPs pesticides are still in their original packages (metal or plastic containers) and are properly stored at the sites mentioned in the table above. One container showed evidence of past leakage but is now properly contained.

**Dioxins and Furans** - During the inventory process, a number of environmental samples (soil and sediment) were collected at selected sites (near textile industry, sugar field, etc.) and sent for analysis to an accredited laboratory in Europe. All these samples were found to contain low levels of dioxins and furans (ranging from 0.001 to 4.0 pg/g WHO-TEQ). In view of these results, the selected sites were not considered to be contaminated. However, as indicated in the NIP, it is proposed that the levels of PCDD/Fs should be monitored in selected environmental media.

<sup>1</sup> Mauritius has no regulatory limits for DDT soil or sludge contamination. Current USEPA limit for total DDT is 5.28 (TEC) and 572 (PEC) ug/g (see also table of abbreviations).



#### **4. Current Safeguarding Conditions at POPs storage and Contaminated Sites are as follows:**

**PCBs** – the contaminated transformers have been decommissioned and are stored at the premises of the St. Louis transformer workshop awaiting disposal. CEB officers and management are aware about PCBs and eager to work out a disposal solution with MOE.

**POPs pesticides** – while the small non-DDT stocks are properly stored and the DDT stock is locked off with access restricted to authorized personnel, the conditions of the DDT bags and drums is poor. There is urgent need to repackage—or to over-pack—the pesticides, especially the DDT, in appropriate safe containers (e.g. polypropylene drums). Also, withdrawals from stocks is not done in a proper way and causes new contamination.

**Contaminated Sites** – there is insufficient safeguarding and, as mentioned, withdrawal from current stock may add to the current contamination.

#### **5. Available Options and Selection**

The obsolete **non-DDT POPs** chemicals to be disposed of are POPs pesticides totaling not more than 85 kg located at three different sites. The chemicals can be safeguarded by over-packing and then shipped to another country and there land-filled or incinerated. A local hazardous waste disposal facility has not been used yet for liquid hazardous wastes in Mauritius but is also under consideration.

There are five **PCB** containing transformers left—all owned by CEB. They are identified as in the table under paragraph 3 above. This represents approximately 5 tons of waste oils and less than 3% of the overall consignment of transformers. Continued analysis of the transformers at CEB's workshop did not reveal any additional PCB contaminated oil. CEB agrees with replacing the contaminated transformers on its cost by new, PCB-free ones under the condition that the project would arrange and pay for the disposal of the replaced ones. This course of action is endorsed and included in this proposal.

Because of the limited scope, local treatment of the PCBs and the equipment may not be economical. It is considered to turn the transformers over to the original manufacturer or the supplier of the replacements as transformer manufacturers commonly have their own disposal programs. Alternatively, another disposal source, for instance from UNEP's "Survey of Currently Available Non-incineration PCB Destruction Technologies", can be selected.

However, transportation by sea must take into account the Basel convention on the Control of Trans-boundary Movements of hazardous Wastes to which the Mauritian Government is a signatory member and that may complicate issues and is in favor of local disposal.

The **DDT stockpiles** are currently not obsolete as the MOH still uses DDT from this inventory for malaria vector control, mainly at the air-and seaports. However, with an annual use of around 600 kg and an inventory of 116 t, the inventory will exceed the life time of the product by a wide margin. The Government intends through donations to shrink the inventory to a more realistic size. A preliminary agreement—through the WHO—has been reached to donate 68 t to Zimbabwe. Samples were taken and sent to South Africa for efficacy testing.

Reportedly, the material's current efficacy is acceptable for the WHO and Zimbabwe. The remaining inventory of 48 t will be repacked and safeguarded at the existing storage facility for regular use and emergency purposes. When MOH decides having enough trust in the non-DDT vector control, this inventory will be declared obsolete and donated or otherwise disposed of. As this can exceed the project's duration, disposal of the remaining DDT will not be a part of the project.

**DDT decontamination** of soil can only be targeted if and when stockpiles have been properly repacked and withdrawal procedures for current use will not create additional contamination. To do so, the use of a silo in the current building is proposed. From this silo, DDT can be taken without soil contamination. The volume should exceed the expected continued use over the next four years (4-5 t) and the silo should be filled before soil decontamination. The general procedure for the decontamination process will be as follows;

- Completed site identification (currently only one site has been preliminary tested)
- Prepare clean-up specifications and disposal techniques
- Locate a disposal site
- Subcontract the clean-up activity
- Arrange supervision procedures
- Conduct the cleanup
- Conduct post-analysis

The costs are highly dependent on the disposal technique. Lowest cost would be transfer of the contaminated soil to the local HW landfill but MOE considers this not a safe option. Local disposal after steam treatment is the next lowest cost option and has been used for budget costing.

## **6. Related projects**

There are many GEF projects that include POPs disposal and decontamination. Several of these projects (Latvia, Mexico) have been analyzed and considered for cost calculations. The remote location of Mauritius makes such comparisons only of limited use. Specifically of interest may be UNIDO projects in Africa (Ghana and Nigeria) They reportedly will include development of a toolkit for environmentally sound and economically feasible remediation technologies and this would be of interest for Mauritius

## **7. Project Outcome, Outputs and Activities**

The outcome of Theme-1, corresponding with the afore mentioned objective, is the removal in an environmentally sustainable way obsolete POPs pesticide and PCB stocks and the remediation of related soil contamination.

Following outputs that are required to meet this outcome have been identified:

### **Output 1: Evaluation and safeguarding of POPs inventories**

As described under baseline conditions, control over POPs inventories is insufficient. In addition, while DDT spot testing has been conducted and contamination above acceptable levels has been identified, testing is by far not complete and contaminated areas are not safeguarded from human exposure. Finally, PCB decontamination programs generally stipulate spot testing of mineral oil-based transformers and capacitors to rule out any cross-contamination. Following activities are therefore required:

Activity 1.1: Complete testing for contamination of soil and cross-contamination of equipment. There is local capacity to conduct those tests.

Activity 1.2: Safeguard existing obsolete POPs stock. DDT will have to be re-packed—or over-packed—to avoid further soil contamination and unnecessary human exposure. PCB containing equipment should be drained and decontaminated. The PCB-containing oil should be properly packed for later disposal. Other POPs pesticides should be collected and over-packed

Activity 1.3: Identify disposal methods, disposal sites and transportation methods and clean-up thresholds to be applied. Mauritius has no hazardous waste disposal site and no suitable incineration facilities. Setting those up may be an expensive proposition in view of the minor generation of hazardous waste on the island. While the options for local disposal will be evaluated, most likely disposal elsewhere will be more cost-effective.

Indicators:       - All POPs contamination of soil and sludge properly identified  
                      - All POPs stockpiles properly safeguarded  
                      - Relevant disposal methods evaluated  
                      - Disposal sites and related transportation identified

#### Output 2: Disposal of obsolete POPs stocks

Building on the evaluation of possible disposal methods and sites, the centralized and safeguarded obsolete POPs inventories will be offered for disposal to the lowest cost qualified disposal center. As mentioned, building up local disposal capacity will be considered but preliminary evaluation shows excessive costs—more than doubling the project budget for Theme-1.

Indicators:       - Preparation of disposal specifications  
                      - Contracting of a disposal site following UNDP bidding guidelines  
                      - Certification of disposal

Output 3: Clean-up of infested areas. Based on current information, only DDT contamination at three sites is expected. Some more testing for PCBs will have to be conducted but soil contamination is unlikely. Specifications will be developed and bidding conducted. The project aims at cleanup of one site financed by GEF and the other two by the Government or Government contractors, applying know-how gained from the first cleanup.

Indicators:       - Preparation of clean-up specifications  
                      - Selection of a contractor following pertinent UNDP bidding guidelines  
                      - Certification of decontamination

Output 4: Institution of a “Responsible Care” program that includes POPs. Several industry and agricultural associations have voiced interest in training programs that focus on safe and sustainable handling and disposal of chemicals in their activities.

Many associations in developed—and increasingly also in developing—countries offer such stewardship programs to their members. It will teach to:

- Avoid/minimize human exposure to hazardous chemicals
- Identify alternative chemicals with less adverse effects
- Properly administer chemical stocks
- Avoid uncontrolled disposal of industrial/agricultural wastes such as burning

Following activities are important building stones for a successful training program<sup>2</sup>

Activity 4.1: Provide a suitable legal framework on chemical handling that includes

- A list of chemicals that cannot be imported (and includes all POPs)

---

<sup>2</sup> Reference: The National Environmental Training Association – “Designing Effective Environmental Training

- Stockpiling and handling of chemicals
- Cleanup levels in case of spills and other contamination
- Training requirements

Activity 4.2: Conduct a training needs, analysis, a task analysis, and develop learning objectives. This is a pre-requisite for organizing available information into a logical format.

Activity 4.3: Prepare a training syllabus. This will provide structure to the training sessions and provide the necessary documentation. The syllabus needs to be discussed and agreed upon with the stakeholders prior to delivering the training.

Activity 4.4: Deliver the training. This should include some verification method to assure that the training is understood (tests).

Indicators:       - Promulgation of the actual regulations  
                      - Preparation of a training syllabus  
                      - Issuance of training certificates

The following project Logical Framework and Implementation plan applies:

### Project Logical Framework Theme-1

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
<p><b>Development objective</b></p> <p>To reduce emission of POPs into the global environment</p>			
<p><b>Immediate objective</b></p> <p>Removal of obsolete POPs stocks and remediation of related POPs contamination in Mauritius</p>	<ul style="list-style-type: none"> <li>- Analysis and safeguarding of existing obsolete POPs stockpiles and contaminated areas</li> <li>- Disposal of obsolete POPs stockpiles</li> <li>- Decontamination of POPs-contaminated areas</li> </ul>	<p>Progress reports</p>	<ul style="list-style-type: none"> <li>- Assumes good project management with regular reporting</li> </ul>
<p><b>Output 1</b></p> <p>Evaluation and Safeguarding</p>	<ul style="list-style-type: none"> <li>- All POPs contamination of soil and sludge properly identified</li> <li>- All POPs stockpiles properly safeguarded</li> <li>- Relevant disposal methods evaluated</li> <li>- Disposal sites and related transportation identified</li> </ul>	<ul style="list-style-type: none"> <li>- Project progress reports</li> <li>- Expert mission reports</li> <li>- Test analysis reports</li> <li>- Field visits</li> </ul>	<ul style="list-style-type: none"> <li>- Assumes good cooperation between local experts, international experts and project management.</li> <li>- A risk will be overlapping responsibilities and lack of methodology</li> </ul>
<p><b>Output 2</b></p> <p>Disposal of obsolete POPs Inventories</p>	<ul style="list-style-type: none"> <li>- Preparation of disposal specifications</li> <li>- Contracting of a disposal site following UNDP bidding guidelines</li> <li>- Certification of disposal</li> </ul>	<ul style="list-style-type: none"> <li>- Written specifications</li> <li>- Bidding documents</li> <li>- Bid analysis report</li> <li>- Contracts</li> <li>- Shipping papers</li> <li>- Certification(s) of disposal</li> </ul>	<ul style="list-style-type: none"> <li>- Assumes the identification of sufficient qualified potential contractors</li> <li>- Assumes abiding by the Basel Convention</li> <li>- Risks violation of procedures and international treaties</li> <li>- Risks that surplus DDT will not be accepted in other countries</li> <li>- Risks expiration of efficacy of DDT</li> </ul>
<p><b>Output 3</b></p> <p>Clean-up of contaminated Areas</p>	<ul style="list-style-type: none"> <li>- Preparation of clean-up specifications</li> <li>- Selection of a contractor following pertinent UNDP bidding guidelines</li> <li>- Certification of decontamination</li> </ul>	<ul style="list-style-type: none"> <li>- Written specifications</li> <li>- Bidding documents</li> <li>- Bid analysis report</li> <li>- Contracts</li> <li>- Shipping papers</li> <li>- Certification(s) of disposal</li> </ul>	<ul style="list-style-type: none"> <li>- Assumes the identification of sufficient qualified potential contractors</li> </ul>
<p><b>Output 4</b></p> <p>Institution of a "Responsible Care" program</p>	<ul style="list-style-type: none"> <li>- Preparation of a training syllabus</li> <li>- Issuance of training certificates</li> </ul>	<ul style="list-style-type: none"> <li>- Written training syllabus</li> <li>- Expert reports</li> <li>- Attendance records</li> <li>- Training certificates</li> </ul>	<ul style="list-style-type: none"> <li>- Assumes cooperation with local associations</li> <li>- Assumes interest of participants</li> <li>- Risks resistance to verification ("tests")</li> </ul>

<b>Project implementation plan (Theme 1)</b>				
<b>Activity by output</b>	<b>Timeline</b>			
	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>Output 1: Evaluation and Safeguarding</b>				
1.1 Complete testing for contamination of soil and cross-contamination of equipment				
1.2 Safeguard existing obsolete POPs stock				
1.3 Identify disposal methods, disposal sites and transportation methods and clean-up thresholds				
<b>Output 2: Disposal of obsolete POPs Inventories</b>				
2.1 Preparation of disposal specifications				
2.2 Contracting of a disposal site following UNDP bidding guidelines				
2.3 Actual disposal and Certification of disposal				
<b>Output 3: Clean-up of POPs-contaminated Areas</b>				
3.1 Preparation of clean-up specifications				
3.2 Selection of a contractor following pertinent UNDP bidding guidelines				
3.3 Certification of decontamination				
<b>Output 4: Institution of a “Responsible Care” Program</b>				
4.1 Conduct a training needs, analysis, a task analysis, and develop learning objectives.				
4.2 Prepare a training syllabus				
4.3 Deliver the training				

### **Related Costs**

A financial plan itemized per output as well as a detailed budget are provided below.

**Project Financial Plan – Theme 1: Disposal of obsolete POPs chemicals and decontamination of POPs-infested areas**

Summary budget by outputs (in US\$)		Personnel	Technical support	Training	Disposal/ Clean-up	Other	Total GEF	CoFin (in kind)	Total Project
Output 1	Evaluation and Safeguarding	5,000	50,000	10,000	40,000	5,000	85,000	30,000	110,000
Output 2	Disposal of redundant POPs Stocks	10,000	90,000	5,000	20,000	5,000	65,000	60,000	130,000
Output 3	Clean-up of infested areas	10,000	90,000	5,000	60,000	10,000	115,000	70,000	185,000
Output 4	Institution of a "Responsible Care" Program	0	110,000	45,000	5,000	5,000	115,000	50,000	165,000
	Monitoring, and Evaluation	5,000	25,000	0	5,000	5,000	20,000	20,000	40,000
	Total Theme 1	30,000	375,000	65,000	130,000	30,000	400,000	230,000	630,000

Detailed budget by inputs (in US\$)		Y 0001	Y 0002	Y 0003	Y 0004	Total	GEF	Co Financing	Total Project
Personnel	Project manager	10,000	10,000	10,000	0	30,000	30,000	0	30,000
	Sub-total	10,000	10,000	10,000	0	30,000	30,000	0	30,000
Technical support	National consultants	20,000	20,000	20,000	0	60,000	60,000	0	60,000
	International consultants	30,000	30,000	30,000	15,000	105,000	105,000	0	115,000
	Government staff inputs	60,000	60,000	60,000	30,000	210,000	43,000	167,000	210,000
	Sub-total	110,000	110,000	110,000	45,000	375,000	208,000	167,000	375,000
Training	Responsible care workshops	5,000	15,000	15,000	20,000	55,000	45,000	10,000	25,000
	Exhibits, brochures, handouts	0	2,000	4,000	4,000	10,000	10,000	0	10,000
Disposal/cleanup	Sub-total	5,000	17,000	19,000	24,000	65,000	55,000	10,000	65,000
	DDT/PCB analyses	10,000	10,000	0	0	20,000	20,000	0	20,000
	Safeguarding of POPs stocks	20,000	0	0	0	20,000	20,000	0	20,000
	Disposal of non-DDT POPs	10,000	0	0	0	10,000	10,000	0	10,000
Miscellaneous	Disposal of DDT	5,000	5,000	5,000	5,000	20,000	0	20,000	20,000
	DDT clean-up activities	10,000	20,000	20,000	10,000	60,000	50,000	10,000	60,000
	Sub-total	55,000	35,000	25,000	15,000	130,000	100,000	30,000	130,000
	Publications and media	1,000	2,000	2,000	0	5,000	5,000	0	5,000
Office facilities & related	Office facilities & related	5,000	5,000	5,000	0	15,000	0	15,000	15,000
	Domestic travel	1,500	1,500	1,000	1,000	5,000	2,000	3,000	5,000
	Other	1,500	1,500	1,000	1,000	5,000	0	5,000	5,000
	Sub-total	9,000	10,000	9,000	2,000	30,000	7,000	23,000	30,000
	Total Theme 1	189,000	182,000	173,000	86,000	630,000	400,000	230,000	630,000

**NOTES:**

- Personnel:** The cost estimates have been derived from local information provided by the MOE and UNDP
- Technical Support:** International expert costs have been based on US\$ 600/day; for national experts, US\$ 200/day has been used
- Training:** These costs exclude experts/presenters
- Disposal/Clean-up:** Following obsolete/to be obsolete POPs need to be disposed off: 116,000 kg DDT  
5,000 kg PCB containing oils  
85 kg miscellaneous pesticides
- DDT will be disposed through donations to other countries (with WHO clearance). The related costs are therefore logistical in nature (loading/unloading, transportation/shipping, etc.)
- The PCB containing oils will first be tried to dispose by returning the transformers to the supplier. If that is not possible, disposal overseas (most likely South Africa) will be tried. In case this is not possible local disposal following UNEP guidelines is the last resort. The costs are estimated US\$ 2,000/t
- The non-DDT pesticides will be solidified, over-packed and disposed at the local special waste landfill cost are expected to be US\$ 1,000 and are included in the safeguarding costs
- Miscellaneous:** Costs are based on local estimates through MOE and UNDP



## ANNEX-2

### **Theme 2: Development and Demonstration of Alternative Strategies for Malaria Vector Management**

#### **1. Introduction and Summary**

Mauritius has in the past experienced catastrophic malaria epidemics, but after the completion of the malaria eradication program the country was declared malaria-free in 1973. Despite this success, the malaria vector *Anopheles arabiensis* remains abundantly present, and outbreaks due to imported malaria cases do occur occasionally.

To prevent reintroduction of malaria, the country has a thorough system for malaria case management in place. Moreover, a number of vector control methods are implemented which include the use of DDT. The large stocks of DDT, donated by WHO in the early 1980s, continue to be used for two purposes: (i) for routine residual spraying around the seaport and airport to prevent the introduction of infected mosquitoes, and (ii) for control of local vector populations in areas or villages where secondary malaria cases have been reported or in the event of a malaria outbreak. DDT is known for its long residual activity on organic surfaces, but is not necessarily superior to other available insecticides when applied to modern-style houses and painted or white-washed structures on which it is currently used.

The PDF phase of the Project has prompted a discussion among the Project's stakeholders, in particular between the Ministries of Environment and Health. This has resulted in the realignment of Project objectives from an initial focus on immediate elimination of DDT towards the feasibility of DDT alternatives, but with the future aim to eliminate DDT provided that this does not increase the risk of malaria reintroduction. Reasons for the realignment of objectives were the lack of experience with, and capacity for, alternative methods and strategies of malaria vector control in the country, and the lack of an evidence-base on cost-effectiveness of the alternatives.

Theme 2 of the Project provides a consolidated plan to attain an enhanced capacity to develop and implement alternative strategies for malaria vector management, with the ultimate aim to eliminate future use of DDT.

To evaluate the continued need for routine residual spraying of DDT at the ports, and to evaluate the selection of insecticide for intra-domicile application, a risk assessment of imported vector-borne disease, and laboratory and small-scale field trials on efficacy of DDT and alternative insecticides will be conducted.

To improve management of local vector populations and, thus, reduce the risk of malaria outbreaks, the Project will address three aspects. First, the capacity for vector surveillance which currently exists at the central level will be decentralized to the district level. This will be achieved through the development of appropriate methods for local surveillance; workshops and on-the-job training to establish district-level mosquito surveillance; and a system of central level support. Second, a multi-stakeholder IVM strategy will be established in the project districts. This will be achieved through workshops on the development of appropriate methods; training workshops on facilitation skills for district staff; multi-stakeholder workshops to establish IVM committees at district/municipal level; and the establishment of a data management system on IVM. Third, the effectiveness of IVM will be demonstrated in pilot districts through an impact study covering health, ecological, behavioral and socio-economic parameters; and through qualitative case study descriptions of the process of decentralized development of IVM.

The proposed activities on vector management will be closely linked to a multi-sectoral national program on chikungunya, a mosquito-borne disease that has caused a major epidemic in Mauritius in 2006, and which has led to intensified use of DDT at the ports. Demonstrated synergistic effects between the control of malaria and chikungunya suggests that the incremental funds of the Project can be utilized to assist in establishing a long-term institutionalized and decentralized IVM strategy, which is able to deal with the continuous threats of various diseases for which the mosquito vectors are already present in the country. This will reduce the future need for DDT.

## **2. Objective of Theme-2**

To enhance the ability to develop and implement alternative strategies for malaria vector management with the ultimate aim to eliminate future use of DDT.

## **3. Background**

Mauritius has an extraordinary history of malaria. Prior to the mid-1800s, malaria vectors were not present on Mauritius. The arrival of the highly effective mosquito vectors *Anopheles funestus* and *An. arabiensis* in the second half of the 19th century resulted in catastrophic epidemics of malaria. In the worst year, 1867, between 12 and 25% of the entire population died from malaria. These epidemics were followed by an era of stable endemic malaria comparable to the present malaria situation on much of the African continent. During the 1950s, the Global Malaria Eradication campaign successfully reduced malaria with a combination of vector control and case surveillance. *An. funestus* was eradicated in the early 1950s. In 1973, the island was declared malaria-free. Today, Mauritius remains virtually free of malaria even though the vector *An. arabiensis* is still abundantly present and, as the current generation of Mauritians is consciously aware, the possibility of new epidemics can never be ruled out. Occasional localized outbreaks of malaria do occur, the most recent one being in 1982, but malaria has so far been prevented from re-establishing itself on the island.

Factors determining the risk of a malaria outbreak are related to four physical components: the parasite, vector, humans and the environment.

- Importation of the parasite into the island depends on the arrival of infected persons and on the timing and effectiveness of diagnosis and treatment. Because drug resistant strains exist in various parts of the world and can thus be expected to be introduced, the choice of first line drugs is crucial.
- The main malaria vector, *An. arabiensis* has characteristics of a highly effective vector due to its competence, biting behavior and longevity of adult females, and can generously proliferate under Mauritian conditions.
- Human factors determining the risk of malaria are the proximity of human residence to vector breeding habitat, domestic conditions such as housing, and human practices and attitudes e.g. related to sanitation, avoidance and personal protection.
- Environmental factors determining the risk of malaria are climate and weather, ecosystem type, land-use and cover (e.g. small-scale agriculture, sugar cane), house types, and the presence of alternative hosts such as cattle.

### **Malaria control in Mauritius**

The present system of malaria control is mainly addressing the first and second components, related to the parasite and the vector. Human and environmental factors, however, are generally not within reach of the health sector.

The parasite component is effectively being addressed in Mauritius through a thorough system of free diagnosis, treatment and follow-up for all malaria cases, free prophylaxis for those traveling to malarious countries, and rigorous screening, treatment and monitoring of travelers from malarious countries.

Vector control is conducted by spraying for adult and larval mosquito stages and to some extent by environmental methods. Between 500 and 1200 kg DDT is used per year as a preventive measure at the seaport and airport by spraying whitewashed or painted concrete walls or ceilings routinely every 6 months to provide a barrier for any adult mosquitoes that manage to escape from cargoes or planes; permethrin is sprayed as aerosol inside all planes coming from countries with mosquito-borne diseases. Furthermore, DDT is sprayed in areas or villages, mostly in modern-type houses, where secondary malaria cases have been reported.

Human factors of disease, such as practices and domestic conditions, and environmental factors (e.g. land-use) are not prime targets for the health sector. Nevertheless, activities aimed to influence human practices have started to be addressed in the chikungunya eradication program through health education and through the media, following the recent outbreaks on the island of this mosquito-borne human disease. The experience of the chikungunya epidemic has underscored that, in order to enhance vector-borne disease control, an integrated strategy is needed which also addresses the human and environment factors, and in which local stakeholders actively participate. The same principles apply to the prevention of malaria epidemics.

#### **4. Challenges**

The health sector's own ongoing vector control efforts are facing several challenges in keeping mosquito populations at a manageable level to reduce the risk of new malaria outbreaks. First, DDT cannot easily be used for Indoor Residual Spraying (IRS) in peoples' homes for several reasons: (i) because of the reported low acceptance of the stains left by DDT on walls, (ii) because DDT might not be the best insecticide for modern-type homes because the chemical does not stick well to plastered walls, and (iii) because the main local vector reportedly prefers to rest outdoors, not indoors, and is thus not an ideal target for indoor spraying. Hence, IRS and the use of DDT are more or less restricted to non-domicile structures, such as storage rooms and cattle sheds. Under those conditions it may be difficult to provide sufficient coverage of spray operations to cause mass killing of local vector populations in the event of a malaria epidemic.

Second, the quality of available stocks of DDT and the efficacy of its use on structures around the ports needs to be confirmed, to rule out the possibility that DDT being routinely sprayed does not have the desired effect on mosquito populations or that it contains toxic DDE. The stock of DDT was donated to the country in 1982 and 1983.

Third, the control of vector proliferation in sunlit water bodies is predominantly by fortnightly application of the broad-spectrum insecticide Temephos by the health sector and, because this chemical in aquatic habitat also kills fish, other natural enemies of mosquitoes and other pests, it will increase the dependency on insecticides as female mosquitoes prefer to deposit their eggs in predator-free water bodies. Even though chemical larviciding is suitable as temporary control measure, in the long term breeding is more effectively controlled through environmental manipulation or modification. The presence of breeding sites is mainly related to the human actions in the domestic, agricultural and construction domains, which generally do not consider the management of malaria vectors. For example, irrigation water in sugar fields, flat roof tops of houses, and water containers used in vegetable gardening, are expected to have a major contribution to vector proliferation. Nonetheless, there are important lessons learnt in Mauritius from the use of non-chemical methods of vector control, such as draining and filling of water bodies, improved irrigation methods, the use of larvivorous fish and improved roof construction, indicating the

practical feasibility of using these tools as components of a more comprehensive vector management strategy. In addition, the use of bacterial insecticides to selectively control mosquito larvae is presently under study. These experiences need to be harnessed in an Integrated Vector Management (IVM) strategy.

### **Integrated Vector Management**

A major risk of the reliance on chemical insecticides for vector control is the development of insecticide resistance in the vector. DDT resistance in *Anopheles arabiensis* has already been found in different parts of Africa, as reported by the African Network on Vector Resistance (ANVR). For example in Ethiopia, a major DDT-using country, there is evidence of widespread resistance to DDT (WHO, 2006). Resistance development in the vector to pyrethroid insecticides, though not yet reported in *An. arabiensis*, is widespread in many African countries in a closely-related sibling species. New and alternative insecticide products for malaria control are emerging at a slow pace. Therefore, there is need for the development of alternative measures and strategies that reduce the selective pressure for resistance development in the vectors. One of these alternatives is the so-called “Integrated Vector Control, or IVM.

The effectiveness of vector-control interventions in easing the burden of major diseases is indisputable and has been established for chemical control methods and non-chemical control methods (Townson 2005). In comparison, there is less information on the effectiveness of IVM strategies, in which the individual vector control methods are combined and targeted in accordance with local risk factors and determinants of disease, because most programs have focused on single interventions. The available information from Africa and South and Southeast Asia indicates positive reductions in transmission and disease rates (Dua et al 1997; Takken et al 1991; Utzinger et al 2001; Van der Hoek et al 2003). An interesting example is the integrated malaria control program in copper mining communities of colonial Zambia in the 1930s, the preserved records of which allowed for retrospective analysis of results (Utzinger et al 2002; Utzinger et al 2001), showing that cost-effectiveness of the integrated approach was comparable to that of single-intervention programs on insecticide-treated bed nets. Recent experience in Mexico in the context of the WHO/UNEP GEF-funded project has demonstrated that integrated vector management resulted in the elimination of DDT use for malaria control in the year 2000 (Chanon et al., 2003).

In 2004, the WHO facilitated the development of a global regulatory and legislative framework on Integrated Vector Management. The purpose was to improve cost-effectiveness, ecological soundness and sustainability of vector control. IVM refers to the use of a number of vector control methods, separately or in combination, tailored according to knowledge about local vector ecology and disease epidemiology. IVM is a still-evolving field. It was modelled along the positive experience with integrated pest management (IPM) systems in agriculture, and based on the premise that effective control requires the collaboration within the health sector and with other sectors, and the engagement of local communities and other stakeholders. A thrust behind the global IVM initiative is the requests by the World Health Assembly-resolution WHA-50.13 and the POPs Convention to reduce reliance on chemical insecticides, particularly DDT, for vector control and to develop viable alternative strategies for managing vector-borne diseases.

In the development of IVM in agriculture the process of ecosystem analysis and decision-making is conducted locally at the farmer level. Likewise in IVM, it is vital to decentralize decision-making for two reasons. Firstly, the risk factors of malaria vary on a small spatial scale, even within a village. For example, the risk of malaria depends on the distance between people’s homes and vector breeding habitat and, consequently requires a precise targeting of certain interventions. Secondly, the risk of malaria relates directly to local people, their actions and conditions, indicating that they need to be involved in IVM programs locally. The same applies to other stakeholders, notably the sugar estates with their area of

70,000 ha of sugar cane, or 35% of the country's total area. When local stakeholders participate in the analysis of risk factors and in the decision-making on coordinated action, this will result in a more integrated and locally-embedded approach to vector management. The active engagement of local stakeholders should be considered as a key factor in assuring sustainability, as reported recently from Asia by WHO ([http://www.searo.who.int/en/Section23/Section1001/Section1110\\_12796.htm](http://www.searo.who.int/en/Section23/Section1001/Section1110_12796.htm)).

### **The multi-sectoral plan on chikungunya**

Following the large-scale epidemic of chikungunya in 2006, a national program was initiated to control the vector and eradicate the disease from the country. Chikungunya is a viral disease transmitted by *Aedes albopictus*, a mosquito that breeds in small water bodies, including water-filled containers, old tires and gutters. There is no antiviral medication to protect against, or treat, this disease. Therefore, control efforts rely solely on vector management. The emergency situation has resulted in a country-wide multi-sectoral plan of action for the eradication of chikungunya, supported by the national budget, local resources and bilateral aid.

The Plan emphasizes the involvement of ministries of health, local government, environment and education, as well as the private sector and community participation, to prevent breeding of the vector and avoid transmission of the disease. Key activities under the plan are mosquito surveillance, case detection and vector control through chemical, cultural and environmental methods. Because success hinges on the participation of local communities, the decentralization of effort is a major feature of the plan.

Mauritius is one of the few countries in the African region that has a vertical system of disease-specific surveillance and control. The multi-sectoral plan, despite it being specific to chikungunya, has already demonstrated its synergistic effects on the prevention of malaria. The chikungunya vector breeds generally in smaller water bodies than the malaria vector but there is an overlap in breeding sites between the vector species, which co-occur in the same areas. Consequently, the health sector has merged its prevention activities for chikungunya with those for malaria, through a combined scheme of surveillance, case detection and control of vector breeding. Clearly, integration of efforts to control these two diseases is the best use of limited resources.

The plan on chikungunya with its elements of inter-sectoral collaboration, strong community involvement and the integrated use of vector control methods has created an opportunity to strengthen the malaria prevention program. Hence, the disease-specific plan to eradicate chikungunya could be utilized to establish a long-term institutionalized and decentralized IVM strategy, which is able to deal with the continuous threats of the introduction of malaria, dengue, Japanese encephalitis as well as other diseases for which the vectors are already present in the country.

### **5. Related projects**

Regional WHO/UNEP projects on the development of alternatives to the use of DDT, with an emphasis on IVM, are ongoing in Sub-Saharan Africa and Mexico/Central America, and regional initiatives are in preparation in the Middle East and South- and South-East Asia. Conditions for malaria disease in Mauritius are most similar to those on the African continent, and Mauritius is part of the WHO-AFRO Region. Therefore, a link between the Mauritian project and the ongoing WHO/UNEP Project in Africa, in which currently three countries participate, is proposed. This link will consist of a provision to join in capacity building exercises on IVM and opportunities for sharing in lessons learnt. Also, the proposed project will be linked to the African Network on Vector Resistance, under the auspices of the WHO, through the participation in workshops of this network. These linkages are expected to benefit the proposed project.

## **6. Project Outcomes, Outputs and Activities**

### **Outcome of Theme-2 (corresponding with the aforementioned objective): An enhanced capacity to develop and implement alternative strategies for malaria vector management**

#### **Output 1: Continued need for DDT evaluated**

DDT is currently used in Mauritius on a calendar basis in the ports, and is occasionally sprayed in villages where secondary malaria cases have been reported. A critical evaluation of the current use of DDT will be conducted to revisit the decision on insecticide selection for indoor residual spraying. Comparative trials of the effective lifetimes of insecticides on local structures are needed so that in future spraying activities the decision on which insecticide to use can be based on scientific evidence.

Activity 1.1: Risk assessment of imported vector-borne disease.

This activity will establish in Year 1 the relative risks of importation of disease cases or vector mosquitoes at the airport and seaport, and will serve to evaluate the role of DDT application on structures at each port.

Activity 1.2: Laboratory and small-scale field trials on efficacy of DDT and alternative insecticides, incl. dissemination of results.

These studies, conducted by a national contracted partner, and conducted according to the most recent WHO standard methods, will provide a critical comparison of the efficacy and period of residual activity of DDT in comparison to alternative insecticides. Vector resting and biting behavior will be studied and available data reviewed. These studies will be conducted during the Year 1.

Activity 1.3: Facilitating decision making on selection of insecticide for indoor residual spraying.

The project will organize a separate meeting of the steering committee with representation from health and environment authorities to present the study findings discuss implications for vector control methods, safety procedures and policies.

Indicators:

- a. Risk assessment of imported disease completed and documented.
- b. Laboratory studies and small-scale field trials on efficacy of DDT and alternative chemicals completed and documented.
- c. Study results to serve as basis for possible replacement of DDT with other insecticides

#### **Output 2: Decentralized capacity for surveillance**

Surveillance is currently conducted by central level divisions of the health ministry. Decentralization of surveillance capacity to the district level will increase the coverage and frequency of surveillance operations in the districts, which is necessary for better targeted and timelier vector management activities. Moreover, strengthening district level capacity will enhance local project ownership. Two project districts will be selected based on the risks of vector-borne disease and prospects for IVM.

Activity 2.1: Development of methods for decentralized surveillance of vector mosquitoes.

Simplified methods and plans for surveillance of larval and adult mosquito stages and for data recording at the district level will be developed jointly with selected district staff.

Activity 2.2: Workshops for training district staff on surveillance of vector mosquitoes.

Activity 2.3: On-the-job training to establish mosquito surveillance in project districts.

Activity 2.4: Assistance and supervision by central level. Supervision and data management will be conducted at the central level.

Indicators:

- a. Health inspectors and vector control teams in the project districts trained and supervised on aspects of vector surveillance
- b. Doubling of coverage or frequency of surveillance in project districts.

### Output 3: Decentralized IVM strategy established

Activity 3.1: Workshops to develop curricula for hands-on education of local stakeholders.

This activity will focus on practical exercises to facilitate learning about mosquito biology and ecology and disease epidemiology in people's own circumstances.

Activity 3.2: Workshops to develop methods for analysis and decision-making on IVM at district and municipal level. The crux of IVM is to establish a process of improved analysis and decision-making at the local level which, of necessity, is not restricted to the health sector but also involves other local stakeholders. At the municipal level, most stakeholders will be civilians, and methods will be adjusted accordingly. Participatory mapping, inventory surveys and other decision tools will be developed or improved to aid in decision making.

Activity 3.3: Training workshops on facilitation skills for district staff. The transition from a vertical system of vector control to localized analysis and decision-making on vector management activities (which include core interventions by the health sector, where needed) requires leadership and skills to facilitate other stakeholders to part-take in the IVM strategy. Practical training will draw on experiences from other disciplines.

Activity 3.4: Multi-stakeholder workshops on IVM to establish IVM committees at district/municipal level. This activity will prepare the stakeholders at the district and municipal levels in project districts to learn about vector biology and disease epidemiology, to apply the newly developed analytic and decision-making tools and methods to jointly decide on vector management action and roles, and to discuss evaluation of the activities.

Activity 3.5: Establishing a central data management system on IVM.

An information system will be established for data collected and owned at the district and municipal level for purposes of monitoring, evaluation and impact assessment. The system will be linked to the information systems currently being developed under the chikungunya program.

Indicators:

- a. Mechanisms established and methods developed for analysis and decision-making for IVM at district and municipal levels.
- b. District staff trained on facilitation skills.
- c. Curricula developed for hands-on education of local stakeholders on the biology and epidemiology of disease.
- d. Multi-stakeholder IVM committees and implementation of IVM established in project districts.

### Output 4: IVM demonstrated in pilot districts

Activity 4.1: Longitudinal impact study covering health, ecological, behavioral and socio-economic parameters in project districts. This interdisciplinary study will be carried out during the length of the project.

Activity 4.2: Qualitative case study descriptions of the process of decentralized development of IVM.

Activity 4.3: Dissemination of results.

Indicators:

- a. Increase in environmental management by communities
- b. Low seasonal peaks of vector mosquitoes
- c. Absence of malaria outbreaks

The following project Logical Framework and Implementation plan applies:



## Project Logical Framework

NARRATIVE SUMMARY	INDICATORS OF ACHIEVEMENT	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
<p><b>Development objective</b> To reduce emission of POPs into the global environment</p>			
<p><b>Immediate objective</b> To enhance the national ability to prevent or manage vector-borne diseases with reduced reliance on DDT</p>	<p>a. Reduced seasonal densities of malaria vector mosquitoes b. Reduced annual use of DDT c. Absence of malaria outbreaks</p>	<p>Reports made by partner organizations Impact study (before and after) in selected locations</p>	<p>a. Assumes continued central government support for inter-sectoral collaboration and decentralization of health services b. Assumes that prophylactic measures and medication efforts for malaria control remain at the current high level</p>
<p><b>Output 1</b> Continued need for DDT evaluated</p>	<p>a. Risk assessment of imported disease conducted b. Laboratory studies and small-scale field trials on efficacy of DDT and alternative chemicals completed c. Study results to serve as basis for possible replacement of DDT with other insecticides</p>	<p>a. Field visits by project staff and reports on research findings from partner organization b. Official data on insecticide use for indoor residual spraying</p>	<p>Assumes that the evaluation results will form a conclusive basis for decision-making</p>
<p><b>Output 2</b> Decentralized capacity for surveillance strengthened</p>	<p>a. Health inspectors and vector control teams in the project districts trained and supervised on aspects of vector surveillance b. Doubling of coverage or frequency of surveillance in project districts.</p>	<p>a. Project monitoring and evaluation visits. b. Central-level supervisory visits c. Surveillance records and database.</p>	<p>Assumes an increased mandate for district health offices. This is considered inherent to the decentralization effort and is expected to enhance local ownership</p>
<p><b>Output 3</b> Decentralized IVM strategy established</p>	<p>a. Mechanisms established and methods developed for analysis and decision-making for IVM at district and municipal levels b. Curricula developed for hands-on education of local stakeholders on the biology and epidemiology of disease c. District staff trained on facilitation skills d. Multi-stakeholder IVM committees and implementation of IVM established in project districts</p>	<p>a. Project monitoring and evaluation visits b. Reports of specific meetings by health staff c. Detailed case study reports</p>	<p>Assumes that actors other than Health are willing to take responsibility for environmental health. Mitigation: the provided education will link vector-borne disease to domestic, construction and agricultural activities (incl. sugar sector)</p>
<p><b>Output 4</b></p>			

IVM demonstrated in project districts	a. Increase in environmental management by communities b. Low seasonal peaks of vector mosquitoes c. Absence of malaria outbreaks	a. Mosquito surveillance data b. Health office reporting system c. Impact assessment study covering health, ecological, behavioral and socio-economic parameters	Assumes coverage of project districts Risk: Occasional seasonal typhoons may lead to increased vector breeding habitat
---------------------------------------	---	--	---

## Project implementation plan (Theme 2)

Activity by output	Timeline			
	Year 1	Year 2	Year 3	Year 4
<b>Output 1: Continued need for DDT evaluated</b>				
1.1 Risk assessment of imported vector-borne disease	█			
1.2 Laboratory and small-scale field trials on efficacy of DDT and alternative insecticides, incl. dissemination of results	█	█		
1.3 Facilitating decision making on selection of insecticide for indoor residual spraying		█		
<b>Output 2: Decentralized capacity for surveillance</b>				
2.1 Development of methods for decentralized surveillance of vector mosquitoes	█			
2.2 Workshops for training district staff on surveillance of vector mosquitoes		█		
2.3 On-the-job training to establish mosquito surveillance in project districts		█	█	█
2.4 Assistance and supervision by central level			█	█
<b>Output 3: Decentralized IVM strategy established</b>				
3.1 Workshops to develop curricula for hands-on education of local stakeholders	█			
3.2 Training workshops on facilitation skills for district staff	█	█		
3.3 Workshops to develop methods for analysis and decision-making on IVM at district and municipal level	█	█		
3.4 Multi-stakeholder workshops on IVM to establish IVM committees at district/municipal level		█	█	█
3.5 Establishing a central data management system on IVM		█	█	█
<b>Output 4: IVM demonstrated in pilot districts</b>				
4.1 Longitudinal impact study covering health, ecological, behavioral and socio-economic parameters in project districts	█	█	█	█
4.2 Qualitative case study descriptions of the process of decentralized development of IVM		█		
4.3 Dissemination of results		█		

**Related Costs:** A financial plan itemized per output as well as a detailed budget are provided below.

**Project Financial Plan - Theme 2: DDT alternatives tested and implemented**

Summary budget by outputs (in US\$)		Personnel	Technical support	Training	Equipment	Misc.	Total GEF	CoFin	Total Project
Output 1	Continued need for DDT evaluation	1,500	75,000	0	0	0	26,500	50,000	76,500
Output 2	Surveillance and monitoring	5,000	300,000	20,000	50,000	0	125,000	250,000	375,000
Output 3	Decentralized IVM strategy	10,000	300,000	30,000	50,000	10,000	150,000	250,000	400,000
Output 4	IVM demonstrated in pilot districts	5,000	150,000	20,000	20,000	5,000	150,000	50,000	200,000
	Monitoring, impact assessment	10,000	100,000	20,000	15,000	5,750	50,750	100,000	150,750
	Total Theme 2	31,500	925,000	90,000	135,000	20,750	502,250	700,000	1,202,250

Detailed budget by inputs (in US\$)		Y 0001	Y 0002	Y 0003	Y 0004	Total	Total GEF	CoFin	Total Project
Personnel	Project manager	5,000	5,000	10,000	10,000	30,000	30,000	0	30,000
	Local consultant		500	500	500	1,500	1,500	0	1,500
Technical support	Sub-total	5,000	5,500	10,500	10,500	31,500	31,500	0	31,500
	National consultants	30,000	40,000	40,000	40,000	150,000	150,000	0	150,000
	International consultants	25,000	50,000	50,000	50,000	175,000	175,000	0	175,000
	Research sub-contract for output 1	30,000	10,000	0	0	40,000	40,000	0	40,000
Training	Government staff inputs (CoFin)	110,000	150,000	150,000	150,000	560,000	0	560,000	560,000
	Sub-total	195,000	250,000	240,000	240,000	925,000	365,000	560,000	925,000
	Participation in regional workshops	5,000	5,000	5,000	5,000	20,000	10,000	10,000	20,000
Equipment	In-country workshops, meetings	10,000	20,000	20,000	20,000	70,000	35,000	35,000	70,000
	Sub-total	15,000	25,000	25,000	25,000	90,000	45,000	45,000	90,000
	Equipment and supplies	15,000	15,000	15,000	15,000	60,000	60,000	0	60,000
Miscellaneous	Office/laboratory	15,000	20,000	20,000	20,000	75,000	0	75,000	75,000
	Sub-total	30,000	35,000	35,000	35,000	135,000	60,000	75,000	135,000
	Publications and media	500	2,000	2,000	500	5,000	750	4,250	5,000
Total Theme 2	Domestic travel	1,000	1,500	1,500	1,000	5,000	0	5,000	5,000
	Other	2,500	2,500	2,500	3,250	10,750	0	10,750	10,750
	Sub-total	4,000	6,000	6,000	4,750	20,750	750	20,000	20,750
	Total Theme 2	249,000	321,500	316,500	315,250	1,202,250	502,250	700,000	1,202,250



## ANNEX-3

### PROJECT IMPLEMENTATION FRAMEWORK

This project will be executed by the Ministry of Environment and National developing Unit (MOE) with the support of UNDP Country Office under Country Office Support to NEX modality. The recruitment of consultants and other contractual arrangements such as procurement of goods of significant value will be provided by UNDP.

The project will be monitored by a Steering Committee (SC). It will meet bi-annually to review implementation progress, endorse work plans, provide guidance and assist in the resolution of any issues experienced during implementation. The committee will be chaired by the National Project Director of the Ministry of Environment and appointed from the following entities:

- Ministry of Health & QL
- Ministry of Environment & NDU
- Ministry of Public Utilities
- Ministry of Industry, Small & Medium Enterprises, Commerce & Cooperatives
- Farmers Service Corporation
- MSIRI
- MACOSS
- Ministry of Agro Industry & Fisheries
- CEB
- Mauritius Revenue Authority (Customs & Excise Department )
- AREU
- University of Mauritius
- Ministry of Finance & Economic Development
- UNDP
- Ministry of Labour & I.R.
- Ministry of Local Government
- Ministry of Tourism
- NGOs (APEXHOM, MACOSS, MFW AND PANeM)

MOE will carry overall executing responsibility of all aspects of the execution of the project. It will appoint a **National Project Director** (NPD), responsible for:

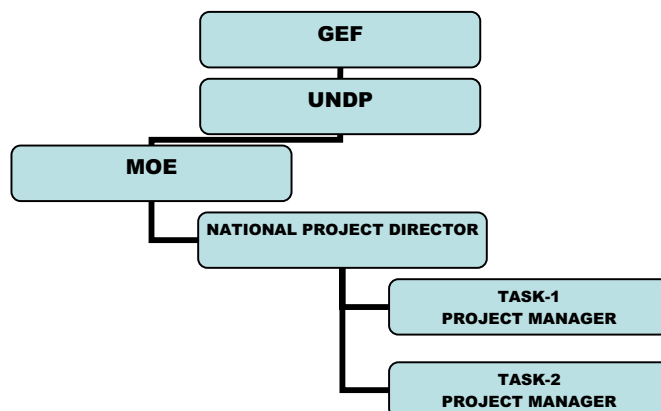
- reporting and monitoring,
- standard setting (waste disposal as well as clean-up levels),
- all aspects of execution not assigned to UNDP (major contracts),
- any other project-related activities, and
- Coordination with other ministries in their areas of responsibilities<sup>3</sup>

A Project Manager for each theme will be recruited following relevant UNDP procedures. Both Project Managers will report to the NPD.

Schematically, this will look as follows:

---

<sup>3</sup> For instance, The ministry of Local Government is responsible for waste removal.



The National **Project Director (NPD)** will be assigned by MOE the overall responsibility for the implementation of the projects. The NPD will have financial responsibility as per local UNDP guidelines, serve as secretary of the SC, provide administrative support to this committee and be responsible for the coordination with other ministries. He/she will supervise their activities.

The **Task-1 Project Manager** will be recruited by UNDP for the entire implementation period of the task. Activities in the context of Theme-1 include:

- the task’s timely execution;
- preparation of work plans
- progress reporting;
- directing the input of consultants and contractors, retained under this task; preparation of terms of reference for particular activities; and
- preparation of procurement requests to UNDP.

Required qualifications are a graduate degree in chemistry, environmental sciences or related fields; at least 6 years and at least six years experience. Experience with waste removal and environmental cleanup activities is desirable while proficiency in English mandatory.

The **Task-2 Project Manager** will be recruited by UNDP and serve for the entire implementation of the task. Activities in the context of Theme-2 include:

- the task’s timely execution;
- prepare work plans on IVM in collaboration with the national partners;
- mobilize inputs to support the work plans;
- maintain close and functional linkages with national partners;
- coordinate IVM activities and its linkages with the chikungunya program;
- communicate activities with the Project Manager;
- direct or assist in the preparation of reports on project activities;
- maintenance and reporting of administrative and financial records.

This expert will conduct first-hand monitoring and quality control of the inputs by the subcontractors and consultants operating under Theme 2, the results of which will be reported to the NPD. Required qualifications are a post-graduate degree in entomology; at least 6 years of experience in disease vector management; knowledge about public health activities at the district level; experience with

participatory approaches is desirable; demonstrated capability to work effectively with national policy makers, program managers and researchers; proficiency in English.

National and international experts will be recruited by UNDP based on TORs prepared by the NPD and the Theme project managers. At this point, one of each per Theme appears to be sufficient.

## ANNEX-4

### Monitoring and Evaluation Plan and Budget

The project will eliminate the use of DDT in malaria vector control and PCB containing oils in electrical transformers in combination with a POPs disposal and decontamination program. This will include:

- Demonstration of alternative, non-DDT vector control methods
- Replacement of PCB-containing transformers
- Disposal of obsolete DDT (116 t minus what will be used in the transition period)
- Disposal of obsolete PCB containing oils (5 t)
- Disposal of obsolete POPs pesticides (85 kg)
- Decontamination of about 450 m<sup>2</sup> DDT-infested soil
- Creation of awareness of and skills to deal with POPs in particular and hazardous chemicals in general

Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF policies and procedures. Specifically, compliance with GEF-4 indicators, being:

- Regulatory and enforcement capacity in place
- Obsolete pesticides disposed of
- PCBs phased out and disposed of
- Reduced risk of exposure to POPs of project-affected people
- Knowledge management packages developed, and
- Viability/cost-effectiveness of alternatives to POPs, particularly in Theme-1, is demonstrated in a number of settings

will be observed.

A Project Steering Committee including the government, UNDP, industry and NGO representatives will be constituted at project inception and will meet quarterly to

- review project progress,
- provide strategic guidance, and
- approve annual work plans and budgets.

The project team will report to the Project Steering Committee on a regular basis as follows:

- Through **quarterly reports** as per UNDP rules. For this reporting a suitable results-based reporting component will be designed
- Through **annual reports** as per UNDP and GEF rules. For this reporting, a harmonized APR/PIR (UNDP's Annual Project Report and GEF's Project Implementation Report) will be prepared and disseminated each year between April and June
- A mid-term evaluation will not be carried out based on the project's design
- An independent evaluator will conduct a terminal evaluation with a lessons-learned section for wide distribution to other countries planning similar projects.



Monitoring and Evaluation plan and budget is as below.

<b>M&amp;E activity</b>	<b>Lead responsible party</b>	<b>Budget (GEF)</b>	<b>Time frame</b>
Inception Report	Project Implementation Team	None	At the beginning of project implementation
Annual Project Report (APR) and Project Implementation Review (PIR)	The Government, <b>Implementing Agency (IA) Country Office</b> , National Executing Agency, Project Team, IA Task Manager, and Target Groups	None	Every year, at latest by July of that year
Implementing Agency (IA) annual reports	The Government, IA Country Office, National Executing Agency, Project Team, <b>IA Task manager</b> , and Target Groups	None	Every year
Frequent Progress reports	Project Manager	None	To be determined by Executing Agency
Mid-term evaluation	Government, IA Country office	None	Will not be conducted.
Terminal Evaluation, including lessons learned	GEF Secretariat, Project team, IA headquarters and Task Manager, IA Country Office, National Executing Agency	16,000	At the end of project implementation
Terminal Report	IA Country Office, IA Task Manager, Project Team	None	At least one month before the end of the project
Audit	National Executing Agency, IA Country Office, Project Team	4,000 (total for project duration)	Yearly

## ANNEX-5

### ABBREVIATIONS USED

AOSIS	Alliance of Small Island States
ANVR	African Network on Vector Resistance
AREU	Agricultural and Research Extension Unit
ARPEGE	Appui Régional pour la Promotion de l'Éducation à la Gestion de l'Environnement
BAT	Best Available Techniques
BEP	Best Environmental Practices
CEB	Central Electricity Board
COMESA	Common Market for Eastern and Southern Africa
CRM	Certified Reference Material
CSO	Central Statistics Office
CWA	Central Water Authority
DCC	Dangerous Chemicals Control (Act)
DDT	Dichlorodiphenyltrichloroethane
DDE	<u>Dichlorodiphenyldichloroethylene</u> (a DDT derivative)
EPA	Environment Protection Act (2002)
FAO	Food and Agricultural Organization
GCMS	Gas Chromatography Mass Spectrometry
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNP	Gross National Product
ICT	Information and Communication Technology
IPM	Integrated Pest Management
IPP	Independent Power Producers
IRS	Indoor Residual Spraying
IVM	Integrated Vector Management
ICCM	International Congerence on Chemical Management
MACOSS	Mauritius Council of Social Services
MEA	Multilateral Environmental Agreement
MOE	Ministry of Environment

MOF	Ministry of Finance & Economic Development
MOH	Ministry of Health & Quality of Life
MOLG	Ministry of Local Government
MSIRI	Mauritius Sugar Industry Research Institute
MUR	Mauritian Rupee
NDU	National Development Unit
NEL	National Environmental Laboratory
NGO	Non-governmental Organization
NIP	National Implementation Plan
PAS	Principal Assistant Secretary
PCBs	Polychlorinated biphenyls
PCDD/Fs	Polychlorinated Dibenzo-p-Dioxins and Furans
PEC	Probable Effect Concentration
POPs	Persistent Organic Pollutants
ppm	Parts per Million
PSC	Project Steering Committee
SAICM	Strategic Approach to International Chemicals Management
SADC	Southern African Development Community
SIDS	Small Islands Developing States
TAC	Technical Advisory Committee
TEC	Threshold Effect Concentration
TEQ	Toxicity Equivalent (a measurement to compare compounds in toxicity)
TOR	Terms of Reference
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UPOPS	Unintentional POPs
US\$	United States Dollar
WHO	World Health Organization
WMA	Wastewater Management Authority
WTO	World Trade Organization

## **Annex B: Terms of Reference**

### **Terms of Reference National Project Director (NPD)**

The NPD is a senior state employee designated by the National Executing Agency (Ministry of Environment and National Development Unit) who is entrusted with the overall guidance and coordination of the project's implementation. It is a position which is also an in kind contribution provided by the Government. The NPD is accountable to the National Executing Agency and UNDP for the production of the required project outputs and outcomes, the effective and appropriate use of the project resources provided by GEF, and the coordination of the UNDP/GEF project with other relevant programmes and projects being implemented in Mauritius.

#### **In particular, the NPD will:**

- approve the project work plan, any budget revisions and, if necessary, any revisions to the project work plan and project itself;
- chair meetings of the Project Steering Committee;
- ensure that governing legislation, rules and procedures are fully met in the course of the project's implementation;
- review Terms of Reference and reports produced by the Project Manager and the key experts/contractors, and assist in the selection of project staff;
- approve procurements;
- certify financial reports including reports on advances and reports on disbursements;
- approve/certify project monitoring reports (APRs), audit reports and evaluation reports;
- facilitate liaison and cooperation with Government authorities at all levels in the course of the project's implementation;
- report to the National Executing Agency and UNDP/GEF on the use of project resources and the achievement of the project's outputs and outcomes.

The work of the NPD will be supported by the Project Manager and other members of the Project Implementation Unit (PIU) working under UNDP contracts for the duration of the project. The NPD can partially delegate some of his/her responsibilities to the Project Manager and the PIU. The NPD will also liaise closely with the national GEF Focal Point.

## **Terms of reference Project Manager**

### **Responsibilities**

1. Operational management of the achievement of project outputs according to the project document and the procedures in the UNDP “NEX Guideline”<sup>1</sup>;
2. In collaboration with the UNDP country office, ensure all implementation arrangements are carried out smoothly;
3. Prepare and update project work plans in collaboration with the UNDP office and close liaison with project sites;
4. Organization and management of project activities according to the work plan to produce the envisaged outputs;
5. Ensure timely preparation and submission of financial reports and settlement of advances;
6. Securing proper use of project budget;
7. Timely preparation and submission of the Annual Progress Report (APR) and any other substantial reports required by GEF and UNDP;
8. Reporting to the NPD and UNDP Programme Officer on a regular basis;
9. Identification and resolution of implementation problems, with the guidance of the NPD.

### **Tasks**

1. Assume operational management of the project in consistency with the project document and policies and procedures for nationally executed projects
2. Ensure that the project outputs are achieved as identified in the Project Document and as advised and instructed by the Project Steering Committee
3. Amend Work Plan in accordance to output delivery
4. Draft ToRs for experts and subcontractors to be approved by Steering Group (or Project Director), organize tender for experts according to ToRs approved (finds experts)
5. Oversee the financial management of the project in consultation with the Project Director and in with the assistance of the UNDP Mauritius office
6. Sets tasks and deadlines for experts and subcontractors and oversee their performance
7. Prepare all necessary documentation for Steering group meetings
8. Prepare and submit all necessary reports (including financial) as required by UNDP
9. Ensure that financial procedures for NEX are followed.
10. In cooperation with UNDP prepare mandatory and any other budget revisions or Project Document revisions as required by UNDP rules.
11. Facilitate and cooperate with audit processes at all times as required.
12. Organize and undertake consultations with experts and seminars

---

<sup>1</sup> NEX - National Execution modality for UNDP projects

13. Organize and oversee any missions set during the period of the project lifetime. Prepare mission statements
14. Prepare and maintain meeting minutes
15. Carry out and manage any procurement under the project
16. Manage the project resources e.g. office equipment, furniture and stationery procured under the project
17. Develop and maintain a database of project international and local experts as well as database of project stakeholders and beneficiaries
18. Organize and coordinate evaluation of the project.

### **Expertise required**

- Graduate in Chemistry, Public Health, Biology, Ecology, Environmental science or Economics
- Knowledge and experience in project management (including finance management)
- Experience in project planning, implementation and monitoring
- Excellent communication and organization skills (experience working with the private sector is considered an asset)
- Full computer literacy and experience in working with PC-based equipment
- Good knowledge of principles of chemicals management (as related to the Stockholm Convention in particular)
- Full proficiency in English. Good knowledge of French is considered an asset.



### SIGNATURE PAGE

#### Country: Republic of Mauritius

Expected Output(s)/Indicator(s): Use of POPs chemical phased out by 2010

Country Programme Outcome(s): Capacities for management of persistent organic pollutants, mainstreaming climate change adaptation strategies and integrating energy conservation into policy and programme development enhanced at country level.

Implementing partner: Ministry of Environment and National Development Unit

Other Partners: Ministry of Health and Quality of Life, Ministry of Local Government and the State Law Office

Programme Period: 2005-2007 and 2009-2011  
 Programme Component: Climate change and Energy  
 Project Title: Sustainable Management of POPs in Mauritius  
 GEF Project ID: PIMSNo. 3779  
 Award id: 00050118  
 ATLAS Project ID: 00061756  
 Project Duration: 4 years  
 Management Arrangement: NEX supported by Country Office

<b>Budget</b>	<b>USD 902,250</b>
<b>GEF</b>	USD 902,250
Allocated resources:	
• Government (co-financing)	USD 900,000
• Other (co-financing):	USD 30,000
<b>TOTAL PROJECT COSTS:</b>	<b>USD 1,832,250</b>

#### Agreed by:

<u>On behalf of:</u>	<u>Signature</u>	<u>Date</u>	<u>Name/Title</u>
Government of Mauritius	<i>A. Mansoor</i>	24/6/08	Mr Ali Michael Mansoor Financial Secretary GEF Operational Focal Point Ministry of Finance and Economic Development
Implementing/Executing Agency	<i>[Signature]</i>	11/07/08	Mr. Sateaved Seebaluck Permanent Secretary Ministry of Environment and National Development Unit
UNDP	<i>[Signature]</i>		Mr. Claudio Caldarone Resident Representative