



# REQUEST FOR CEO APPROVAL

PROJECT TYPE: MEDIUM-SIZED PROJECT

TYPE OF TRUST FUND: NPIF

## PART I: PROJECT INFORMATION

Project Title: Developing the microbial biotechnology industry from Kenya's soda lakes in line with the Nagoya Protocol			
Country(ies):	Kenya	GEF Project ID:	
GEF Agency(ies):	UNEP	GEF Agency Project ID:	00876
Other Executing Partner(s):	UNEP Division of Environmental Laws and Conventions, UNEP DELC and Kenya Wildlife Service, KWS	Submission Date:	28/10/2013
GEF Focal Area (s):	Biodiversity	Project Duration(Months)	48 months
Name of Parent Program (if applicable): For SFM/REDD+		Agency Fee (\$):	95,000

### A. FOCAL AREA STRATEGY FRAMEWORK

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount (\$)	Co-financing (\$)
BD-4	Outcome 4.1: Legal and regulatory frameworks, and administrative procedures established that enable access to genetic resources and benefit sharing in accordance with the CBD provisions	Access and benefit-sharing agreements (number0 that recognize core ABS principles of Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT)	NPIF	916,400	1,585,116
Subtotal				916,400	1,585,116
Project management cost				83,600	166,729
<b>Total project costs</b>				<b>1,000,000</b>	<b>1,751,845</b>

### B. PROJECT FRAMEWORK

Project Objective: The utilization of microbial genetic resources within the protected Kenyan Soda lakes for research, development and commercialization of industrial enzymes and bio-pesticides for improved resource management and livelihoods in compliance with the Nagoya Protocol on Access and Benefit Sharing

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Grant Amount (\$)	Confirmed Cofinancing (\$)

<p>1. To enhance legal and regulatory framework on ABS in Kenya</p>	<p>TA</p>	<p>1.1 Policy, legal and regulatory frameworks on ABS upgraded in compliance with the provisions of the Nagoya Protocol;</p> <p>1.2 ABS institutionalized in protected areas as a tool for enhanced conservation and livelihood improvement</p>	<p>1.1.1 Review of existing legislation that govern conservation and sustainable use of genetic resources in light of the implementation of the case study of this project;</p> <p>1.1.2 Reviewed ABS legislation in light of this project presented to county and National governments to facilitate ratification and implementation of the Nagoya Protocol;</p> <p>1.1.3 At least two joint management plans for the selected soda lakes developed that factor in aspects of benefit sharing from use of genetic resources for research and development;</p> <p>1.2.1 A National bioprospecting steering committee under the National strategy for bioprospecting within and outside protected areas in Kenya established to promote bioprospecting in the soda lakes;</p> <p>1.2.2 Protected area management capacities on ABS enhanced through education and awareness for sustainable use of soda lakes genetic resources in line with the Nagoya Protocol;</p> <p>1.2.3 Tools for monitoring impact of Bioprospecting projects on conservation and community livelihoods established and operationalized;</p> <p>1.2.4 Infrastructure within the soda lakes to enhance research and tourism (e.g Nature trail in Lakes Bogoria, Elementaita and Simbi Nyaima) for KWS and adjacent communities improved;</p>	<p>NPIF</p>	<p>93,000</p>	<p>204,519</p>
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<p>2. Systematic discovery of natural products for bio-pesticides and industrial enzymes</p>	<p>TA</p>	<p>2.1. At least 1 potential microbial isolate characterized and deposited at the Culture Collection Center at Jomo Kenyatta University of Agriculture and Technology (JKUAT), the German Collection of Microorganisms and Cell Cultures (Deutsche Sammlung von Mikroorganismen und Zellkulturen – DSMZ) and Verenium Corporation;</p> <p>2.2. At least 1 enzyme product developed for agro-processing, starch and fuel, textile, food and beverage industries by the participating Kenyan institutions and the private companies (University of Nairobi Science and Technology Park and the JKUAT Enterprise Ltd ), KIRDI, Rivatex and Verenium Corporation as the main industrial partner;</p> <p>2.3. At least 1 biopesticide for enhanced seed and seedling treatment developed by the participating Kenyan institutions and the private companies (University of Nairobi Science and Technology Park, JKUAT Enterprise Ltd and KIRDI);</p> <p>2.4 A living library of Kenyan Soda lakes microorganisms established at JKUAT;</p>	<p>2.1.1. At least 500 samples collected at different seasons from the Soda lakes and 20 pure strains isolated with cellulase, protease and Phytase activities for agro-processing, starch and fuel, textile, food and beverage and protein hydrolysis and deposited in culture collection centers at JKUAT, DSMZ and Verenium Corporation;</p> <p>2.1.2. At least 5 isolates producing bioactive secondary metabolites as biopesticides for seed and seedling treatment characterized and deposited in the culture collection centres in JKUAT and DSMZ;</p> <p>2.1.3. Status of microbial strains in culture collection centres at JKUAT and other partner institutions established and over 200 microbial isolates screened for cellulose degradation and enzymes for detergent and cotton processing;</p> <p>2.2.1. Optimization of fermentation conditions for large scale production of cellulases, proteases and phytases for industrial production;</p> <p>2.2.2. Formulation and evaluation of the produced enzymes for application in starch and fuel, textile, food and beverage industries together with the private companies (University of Nairobi Science and Technology Park, the JKUAT Enterprise Ltd, KIRD, Rivatex and Verenium Corporation);</p> <p>2.3.1. Optimization of fermentation conditions for large scale production of biopesticides for industrial production;</p> <p>2.3.2. Formulation and evaluation of the produced biopesticides for application in the seed and horticulture industry together with the private companies (University of Nairobi Science and Technology Park, JKUAT Enterprise Ltd and KIRDI);</p> <p>2.4.1. Culture Collection Center at Jomo Kenyatta University of Agriculture and Technology (JKUAT) upgraded to a national culture collection to support discovery of potential Soda Lakes microbial products;</p>	<p>NPIF</p>	<p>373,300</p>	<p>606,000</p>
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3. Technology Transfer between resource provider and user operationalized	TA	3.1. Technology transferred (including equipment, know-how and training) from DSMZ and Verenium Corporation to local research institutions and protected area systems management;  3.2. An effective bioinformatics system in Kenya at KWS for Soda lakes microbial discovery to act as a system for monitoring and evaluation established;	3.1.1. Bioprocess technology for efficient secondary metabolite production from the soda lake microorganisms in place;  3.1.2. Improved skills and facilities at the initiated Kenya microbial Strain Depository at JKUAT to serve as a repository for microorganisms and also as a patent deposit;  3.1.3. At least 1 technology registered with the Kenya Industrial Property Institute;  3.1.4 At least 1 product successfully transferred to the private partner and commercialized;  3.2.1. Data handling system on collection and transfer of biological specimen within and outside Kenya established;  3.2.2. A well equipped bioinformatics centre established at KWS;	NPIF	375,100	527,000
4. ABS agreements developed to build the capacity of the Kenyan authorities to engage with users of genetic resources		4.1 A model ABS agreement between provider and user in compliance with the Nagoya Protocol in place;	4.1.1 At least 1 ABS agreement between provider (KWS and Soda lakes communities- county government), local Kenyan institutions (KIRDI, Rivatex, University of Nairobi Science and Technology Park Ltd and the JKUAT Enterprise Ltd), DSMZ and the industrial partner, Verenium Corporation) resulting from research and development of microbial samples taken from the Soda lakes executed;  4.1.2 Prior Informed Consent (PIC), Mutually Agreed Terms (MAT) and Material Transfer Agreements (MTA) developed and operationalized in line with the Nagoya Protocol;	NPIF	75,000	247,597
Subtotal					916,400	1,585,116
Project management cost					83,600	166,729
<b>Total project costs</b>					<b>1,000,000</b>	<b>1,751,845</b>

**C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)**

Sources of Co-financing	Name of Co-financier (source)	Type of Cofinancing	Cofinancing Amount (\$)
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Private company	JKUAT Enterprises Ltd	In-kind	101,000
Private Company	University of Nairobi Science and Technology Park	In-kind	228,500
National Government	JKUAT	in-kind	241,500
Private Company	Verenium Corporation	In-kind	96,597
National Government	University of Nairobi	In-kind	300,000
National government	KWS	Grant & In-kind	210,000
Private Company	Kenya Industrial Research and Development Institute (KIRDI) Enterprise	Grant	210,000
Private Company	Rivatex East Africa (Moi University Company)	Grant	250,000
Multilateral Agency	UNEP DELC	In-kind	114,248
<b>Total Co-financing</b>			<b>1,751,845</b>

#### D. GEF/LDCF/SCCF/NPIF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY<sup>1</sup>

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in \$)		
				Grant Amount (a)	Agency Fee (b) <sup>2</sup>	Total c=a+b
UNEP	NPIF	Biodiversity	Kenya	1,000,000	95,000	1,095,000
<b>Total Grant Resources</b>				<b>1,000,000</b>	<b>95,000</b>	<b>1,095,000</b>

#### E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Estimated Person Weeks funded by GEF	Grant Amount (\$)	Co-financing (\$)	Project Total (\$)
Local consultants*	3	7,500	35,000	42,500
International consultants*	8	21,600	0	21,600
<b>Total</b>	<b>11</b>	<b>29,100</b>	<b>35,000</b>	<b>64,100</b>

\* Details of GEF funded consultants are provided in Annex C.

#### F. PROJECT MANAGEMENT COST

Cost Items	Total Estimated Person Weeks funded by GEF	Grant Amount (\$)	Co-financing (\$)	Project Total (\$)
Local consultants*	0	0	20,000	20,000
International consultants*	0	0	0	0
Office facilities, equipment, vehicles and communications**		45,200	94,000	139,200
Travel***		5,000	20,000	25,000
Others	Administrative assistant	23,000	35,000	58,000
	Inception workshop	6,000	1,000	7,000
	Annual financial audits	4,400	0	4,400
<b>Total</b>		<b>83,600</b>	<b>170,000</b>	<b>253,600</b>

\*Details of GEF funded consultants provided in Annex C.

\*\*Equipment and consumables for project office

\*\*\*GEF funded travel consists of air fares for international consultants for mid-term and final project evaluations.

**G. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT?**

No.

**H. DESCRIBE THE BUDGETED M &E PLAN:**

The project will follow United Nations Environment Programme (UNEP) and Global Environment Facility (GEF) minimum requirements for project monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are an integral part of the UNEP legal instrument that will be signed by the executing agency and UNEP. The Monitoring and Evaluation (M&E) process will include an end of project assessment undertaken by independent review teams. The final reports will be submitted to the GEF M&E Unit as well as other stakeholders and or donors involved in the implementation of this project. A report on the status of implementation of the project will be submitted to the regular meetings of the Project Steering Committee (PSC). The project will be evaluated on the basis of: execution performance, output delivery, and project impact. Evaluation of the project’s success in achieving its outcomes will be monitored continuously throughout the project through the bi-annual progress reports, annual summary progress reports and the final evaluation. Details of M&E activities are provided in the Table below.

Type of M&E activity	Responsible Parties	Budget from GEF	Budget co-finance	Time Frame
Inception Meeting	UNEP-DELC/KWS & UNEP DEPI Task Manager	2,000	5,000	Within 2 months of project start-up
Inception Report	UNEP- DELC/KWS and UNEP DEPI Task Manager	0	500	1 month after project inception meeting
Measurement of project indicators (outcome, progress and performance indicators, GEF tracking tools) at national and global level	UNEP- DELC/KWS and UNEP DEPI Task Manager	10,000	15,000	Outcome indicators: start, mid and end of project Progress/perform. Indicators: annually
Semi-annual Progress/ Operational Reports to UNEP	UNEP-DELC/KWS with input from partners to UNEP DEPI Task Manager	0	500	Within 1 month of the end of reporting period i.e. on or before 31 January and 31 July
Project Steering Committee meetings and National Steering Committee meetings	UNEP DELC/KWS, Collaborating Partners; UNEP DEPI Task Manager	3,000	5,000	Once a year minimum
Reports of PSC meetings	UNEP-DELC/KWS to UNEP DEPI Task Manager	500	500	Annually
PIR	UNEP-DELC/ KWS to UNEP DEPI Task Manager	0	500	Annually, part of reporting routine
Monitoring visits to field sites	UNEP DELC/KWS and UNEP DEPI	10,000		As appropriate
Mid Term Review/Evaluation	UNEP DEPI Task Manager/UNEP EOU	20,000	10,000	At mid-point of project implementation
Terminal Evaluation	UNEP EOU/UNEP DEPI Task Manager	30,000	20,000	Within 6 months of end of project implementation
Audit	UNEP DELC/KWS	4,400	6,000	Annually
Project Final Report	UNEP-DELICI/KWS,	500	500	Within 2 months of the

Type of M&E activity	Responsible Parties	Budget from GEF	Budget co-finance	Time Frame
	final clearance and processing by UNEP DEPI Task Manager			project completion date
Co-financing report	UNEP DELC/KWS	0	500	Within 1 month of the PIR reporting period, i.e. on or before 31 July
Publication of Lessons Learnt and other project documents	UNEP DEPI Task Manager in collaboration with DELC/KWS and project partners	5,000	5,000	Annually, part of Semi-annual reports & Project Final Report
<b>Total M&amp;E Plan Budget</b>		<b>85,400</b>	<b>69,000</b>	

## **PART II: PROJECT JUSTIFICATION**

### **A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:**

#### **A.1.3 Relevant eligibility criteria and priorities of the NPIF:**

The project is consistent with the eligibility criteria and priorities of the fund as it will support the government of Kenya to implement a national ABS project to promote bioprospecting, industrial product discovery and technology transfer on mutually agreed terms between providers and users. In addition the project will facilitate private sector engagement and related initiatives targeting investments in the conservation, sustainable use of genetic resources *in-situ* and community livelihood support. Lessons from this project will be used to update ABS laws and regulations and also to improve the capacities of Kenyans in undertaking ABS-based projects between providers and users in line with Nagoya Protocol.

### **B. PROJECT OVERVIEW:**

#### **B.1 Baseline project and the problem that it seeks to address**

**Biodiversity importance:** Kenya is endowed with diverse habitats that are home to unique and diverse flora and fauna. These diverse habitats are represented within the protected area systems that comprise approximately 12% of the Kenyan territory, classified as national parks, national reserves, marine reserves and forest reserves. These areas have varied ecosystems and habitats ranging from marine, inland wetlands, fresh and salty water lakes, rivers, volcanoes, hot springs, savannahs, forests, mountains, caves and deserts. These are rich in biodiversity, and they serve as the country's biodiversity treasure trove that contribute to both National and global economy, an invaluable and extensive potential for innovative products and processes that are still widely untapped. The soda lakes and associated wildlife continue to attract various types of researchers for both academic and commercial purposes.

Consequently, Kenya has been ranked among the 15 mega diverse countries in the world (UNEP-WCMC; Cancun declaration 2002, Caldecott, J.O., et al 1994). The Soda lakes (Elmenteita, Bogoria, Sonachi, and associated hot springs and vents - Olkaria hot vents and Bogoria geysers) of the rift valley are unique habitats of extremophile fauna and flora. The Soda lakes have been recognized as unique, and of Outstanding Universal Value (OUV) among other comparable lakes globally. They were nominated under the World Heritage Criteria vii, ix, and x based on: (1) exceptional natural beauty un-matched anywhere else (2) Outstanding examples representing ongoing ecological and biological processes in the evolution and development of saline lake ecosystems (3) Significant natural habitats for in-situ conservation of biological diversity and (4) Presence of globally and regionally threatened species of outstanding universal value. In addition, some of these have been designated as Biosphere reserves and RAMSAR sites.

The Soda lakes are located within the East African Rift Valley System (EARS) which is a continental-scale tectonic structure that has evolved through earth's history to the present scenic and architectural beauty of the geomorphological features. It is characterized by steep fault scarps, deep gorges, step-faulted blocks, cinder cones and craters on the rift floor, horst and graben structures, ramp, box faults, gushing geysers and hot springs. They are

hydrologically and hydrogeologically connected as opposed to most other lakes worldwide, are essential to the hydrological cycle that contributes to geothermal energy. Heated geothermal waters contribute to the lake waters and result in very unique aquatic habitats that support unique assemblages of planktonic and benthic flora and fauna. The EARS acts as sedimentary traps vital for preservation and conservation of fossils and it provides a rich natural archive for palaeoanthropology (hominin and other faunal materials and artifacts) and palaeoecological studies that has only begun to be explored. The uniqueness and associated features combine to create diverse habitats and opportunities for conservation of globally significant biodiversity. The biodiversity includes diverse fauna and flora that is endemic, congregatory, range-restricted, biome-restricted and globally threatened. The three lakes provide one of the biggest assemblages of birds sustaining 75% of the globally significant population of the Near-threatened Lesser Flamingo (*Phoeniconaias minor*). This makes the Kenya Lakes System a critical site for the conservation of Lesser Flamingoes in the world. The lakes also host globally significant populations of 11 congregatory water bird species. Lake Elementaita, one of the sites within the Kenya Lakes System supports one of the major breeding colonies of the Great White Pelicans (*Pelecanus onocrotalus*) in the world. As a home to many birds, the three lakes are also part of the network of sites serving as stop-over, wintering and summering sites for millions of over 100 species of migratory water birds, soaring birds and other terrestrial bird species that use the Great Rift Valley flyway. The migratory birds originate from Europe and northern Asia as well as other parts of Africa. The three lakes also provide a network that constitutes natural habitats for *in-situ* conservation of globally and regionally threatened mammal species. These include the Critically Endangered Black Rhino (*Diceros bicornis*) and Near-threatened White Rhino (*Ceratotherium simum*), among others.

The unique Saline conditions of 3-30% and PH values from 9-11.5 have revealed existence of a wide range of microbial diversity with a great potential for biotechnological applications which has attracted various researchers and bioprospectors for years. A number of microorganisms with industrial applications and potential, especially enzymes, have been isolated from Kenyan Soda lakes, some of which have been commercially exploited. These include organisms of industrial interest particularly for production of enzymes such as proteases; for laundry, detergents or in manufacture of leather, xylanases for pulp and paper industry, cyclodextrin transferase for cyclodextrin manufacture from starch, frequently used in foodstuff, chemicals, cosmetics and pharmaceuticals (Grant et al, 1990, Hirokoshi, 1996). Genetic resources from microbial diversity collected from Lakes Bogoria, Elementeita, Magadi and Nakuru have been sources of various patents such as USA Patent NO's 5,733,767 and 6,420,147B1 and various products on the market some of which are not protected through patents. The products on the market include and not limited to; Pulpzyme® (manufactured by Novozyme), PURAFECT®, PURAFECT®OX, PROPERASE®, PURASTAR®ST PURASTA® OxAm, PURADAX® HA, PURABRITE® AND PURABLEND ®Tide® and Ariel® (developed by Genencor and licensed to Proctor and Gamble). There are various strains isolated from Soda Lakes with commercial potential and others that have been patented for example, *Natroniella acetigena* Zhilina et al 1996 (DSMZ-DSM9952), from lake Magadi, a salt strain extremophile, *Paracoccus bogoriensis* sp.nov, type strain BOG6T(DSM16578=LMG22798) for production of carotenoids (George et al 2009) . Many isolates with useful attributes have been cloned and others with bacteriorhodopsin effects are being used, as models in holographic techniques and information storage (Oren 1998).

Given the importance of soda lakes microorganism for industrial applications, the current focus will be for commercial exploitation of enzymes with cellulase, protease and phytase activities for starch and fuel, textile, food and beverage and protein hydrolysis industries. Partners in this collaboration will also focus on the production of biopesticides for application in the agro-industry i.e seed and seedling treatment of horticultural produce. This partnership involves the providers and users of the soda lakes genetic resources. They include Kenya Wildlife Service (management authority for protected areas), the county Government and the local communities around the soda lakes, University of Nairobi, University of Nairobi science and technology park, JomoKenyatta University of Science and Technology, JKUATes enterprise LTD, Kenya Industrial Research Development Institute (KIRDI), Moi University and Rivatex East Africa, Deutsche Sammlung von Mikroorganismen und Zellkulturen – DSMZ and Verenium Corporation. Verenium Corporation is the main industrial partner that has a vast experience with cutting edge technology on industrial enzyme solutions. The company has developed various industrial enzymes that are already on the market and is among the global leaders in this field. Verenium Corporation (f.k.a Diversa) is one of the pioneer ABS partnership in the country that involved ICIPE and KWS. DSMZ is one of the leading microorganism culture collection centres in the world. DSMZ has a collaborative arrangement with Jomokenyatta University and currently acting as a depository of Kenyan microorganisms from protected areas through Material Transfer Agreement. Kenya Industrial Development Institute



will be involved in pilot production of potential industrial products generated from the Soda lakes project. National Environment Management Authority (NEMA) which implements the ABS legislation and the National Council for Science and Technology (NCST) which also regulates research in the country will partner in the project in realigning ABS with Nagoya Protocol. Therefore this GEF NPIF project will contribute to an effective ABS collaboration that brings together providers, researchers and industrial partners for successful biodiversity business partnership focused on soda lakes microbial genetic resources.

### **Threats to soda lake conservation**

There are various threats affecting microbial genetic resources within the Kenyan soda lakes ecosystems. These include destruction of catchment areas, impact of climate change, environmental pollution, geothermal drilling for energy, alien and other invasive species, overharvesting of water, siltation, biopiracy and lack of appropriate legislations for sustainable utilization and equitable benefit sharing of derived benefits from the soda lakes genetic resources.

### **The problem**

Previous access to genetic material from Kenyan Soda Lakes has not resulted into intellectual property protection and commercialization for the benefit of the country, this is because bioprospecting has not been carried out based on the Access and Benefit Sharing (ABS) arrangements between the providers of resources and users as envisioned in CBD and Nagoya Protocol. This has been due to inadequate consultations and participation of relevant stakeholders for example local communities and County governments, biopiracy, lack of capacity in local institutions to sustainably exploit genetic resources. There has been inadequate policy and legislative instruments laying down the partnerships which define ABS. Currently, there are a number of organisms collected and stored in *ex-situ* germplasm outside the country without proper documentation. These *ex-situ* germplasms' are acting as bioprospecting platform for industrial enzymes, agrochemicals and drug discovery without a clear link to the provider and the user as defined by the Nagoya Protocol. The Nagoya Protocol requires that access to both genetic resources and associated knowledge should be through instruments of PIC, MAT and MTA which clearly define chain of custody and benefit sharing arrangements. These instruments have been lacking in previous bioprospecting activities within the Soda lakes. As a result of these, the benefits of bioprospecting are not realised by Kenya, both in terms of business; financial income; training and employment. These have limited the country's ability to invest in Intellectual Property infrastructure and also to realize its vision 2030 objective on industrialization on knowledge-based economy.

### **Long term solution**

One of the long term solutions is to enhance the capacity of protected area system as focal points for ABS. IUCN believes that strengthening ABS within protected area system is a more practical solution of realizing the three CBD objectives and Nagoya Protocol. Building the capacity of local institutions is an added value to sustainably exploit soda lakes genetic resources through the full cycle of research, product development, to commercialization while protecting intellectual property for the economic benefit of the country will contribute to realization of the CBD and Nagoya Protocol objectives. The Project is focused on linkages between *ex-situ* conservation, through the improvement of the country's microbial culture collections in a well established platform of PIC, MTA, MAT, Private-Public Partnership and enabling policy for realization of the benefits of bio-based economy. The Soda lakes project provide a road map for understanding and improving on already existing partnership as a way of enhancing governance through policies and legislative arrangements for better biodiversity conservation and livelihoods. The Project seeks to enhance the capacity of providers and the users towards bioprospecting and commercial exploitation of microbial diversity in the Kenyan soda lakes for improved biodiversity conservation, livelihood and environmental protection in a Nagoya access and benefit sharing Protocol compliant manner. It is expected that by the end of the Project, there will be equitable and fair benefit flows between all partners and stakeholders. The objectives of the Nagoya Protocol will be realized and Kenya will have an appropriate microbial bio-discovery facility and a designated microbial depository centre that will be critical in matters of patent and therefore a technology transfer platform. Benefits will include both monetary and non-monetary forms where they will be used to enhance capacities of local Kenyans to conserve the Soda lakes landscapes and biodiversity and royalties generated will also contribute to improved livelihoods of communities around the Soda lakes.

The achievements of the solution proposed above have been impeded by the following:

1. *Inadequate data on Microbial resource status and potential;*  
Whereas a number of studies on the soda lakes microbial genetic resources have been undertaken in Kenya, there is no appropriate National designated *ex situ* microbial culture collection centre. The law requires that all microbial specimens collected shall be deposited and duplicated in designated depository centers. Currently there are no designated microbial culture collection centers in the country. Most of the strains are held by individual scientists and others in foreign depository centres with no compliance to elements of Prior Informed Consent, Material Transfer Agreements and the current Nagoya provisions of ABS. DSMZ has vast experience on microorganism culture collections and will play a key role in capacity development of JKUAT culture collection. Monitoring of microbial resources from protected area has been an issue. Verenium with their advanced technology will equip protected area management with skills for microbial sampling and specimen cataloguing through appropriate system for enhanced monitoring in compliance with the Nagoya Protocol. The GEF funding will contribute to upgrading the existing culture collection at JKUAT to a National depository of living microorganisms that will promote Bioprospecting and scientific research in the country and at global level.
  
2. *Inadequate technical capacity to sustainably exploit and commercialize the microbial resources;*  
The country still has low critical mass of trained experts in microbial culture collections, preservation and maintenance. Also technical capacity in bio-processing is still low. The partnership with Private sector will accelerate technology transfer that will lead to more product development and commercialization through agreed ABS agreements. The industrial partner, Verenium Corporation, has a long term experience work with KWS in protected areas and is committed to supporting the project through technology development and commercialization of the derived soda lakes microbial products. The local Universities, KIRDI and Rivatex will be actively involved in research and development of the Industrial Products in partnership with Verenium. The GEF funds will support the bio discovery process and technology transfer between the industrial partner and the resource providers in compliance with the Nagoya Protocol.
  
3. *Policy frame work for partnership between private/public partnership on exploitation of the Soda lakes microbial resources;*  
The Kenya government advocates for sustainable exploitation of her biodiversity through a fair and equitable distribution of resultant benefits of biodiversity utilization in research, development and commercialization as shown in the country's constitution article 69-72. The country's national legislation, Environmental Management and Coordination Act (EMCA), 1999 and the subsidiary EMCA law 2006 legal notice number 160 has established minimum standards for Access and Benefit Sharing. The government has also ratified various multilateral environmental agreements for example the CBD, CITES, ITPGFA and others which also include elements of benefit sharing. The country has also signed the Nagoya Protocol and is in the process of ratifying it. According to the constitution, all multilateral agreements and treaties ratified form part of the Kenyan law. Kenya Government has operational legislation on access and benefit sharing (ABS) of 2006 which is currently being considered for review to align with the constitution and the Nagoya Protocol. Regardless of the current ABS laws setting up minimum standards, there are still major challenges in respect to effective implementation particularly when it comes to user provider partnership arrangement. Currently, all the legislations are being realigned to the constitution including the ABS. The National Environment Management Authority (NEMA) together with stakeholders is in the process of reviewing the ABS legislations. In addition, the Wildlife Act is being reviewed and the new wildlife bill recognizes bioprospecting in protected areas where effective measures have been proposed including benefit sharing, penalties and depositories among others. The GEF funds through the soda lakes project will provide practical example for ABS partnership based on the constitution and the Nagoya protocol which will inform policy and legislative framework in the country.

**Baseline investments** (The Projects where baseline investment is made)

Bioprospecting activities in Kenya were largely initiated by International Organization for Chemical Sciences in Development (IOCD). In 1998, Prof. Weiss led an IOCD Bioprospecting exploratory mission in East Africa which resulted in the expert inception workshop same year at ICIPE that brought together various stakeholders ranging from researchers and policy makers. This was followed by a training program for East African experts comprising 21 Scientists, intellectual property professionals, lawyers and traditional healers from 17 institutions in Tanzania, Uganda

and Kenya on biotechnology and biodiversity law in 1999 by GBDI (Global Biosciences Development Institute, USA) and IOCD. The education and awareness creation from the GBDI/IOCD training built the country's capacity towards establishing appropriate governance structures for effective utilization of genetic resources through research and development. As a result, various technology transfer offices were established in various research institutions and institutions of higher learning. Some of the trainees led the development of the current Kenya's ABS legislation that is under review and are also actively involved in global ABS issues and the Nagoya protocol. Other key contributions from the IOCD exploratory mission and training led to KWS/ICIPE/Verenium Corporation (f.k.a Diversa) and KWS/ICIPE/DUPONT bioprospecting projects which are cited globally as pioneer ABS case studies.

Between 2001 and 2009 KWS/ICIPE/Verenium Corporation (f.k.a Diversa) and KWS/ICIPE/DUPONT entered into pioneer ABS type agreements that focused on bio-discovery of various types of natural products for industrial use from Kenya's biodiversity in protected areas. This partnership led to building capacity of Kenyans on various aspects including sampling, analysis and data management of biodiversity samples. The total investments from the above pioneer agreements are estimated at US\$ 1.8million. The pioneer ABS agreements gave room for local institutions to build their capacity towards Bioprospecting on the indigenous local resources. The soda lakes project brings together National government, County government and local communities as per the Kenyan constitution to utilize the indigenous genetic resources and associated traditional knowledge. This partnership brings together KWS, local communities, University of Nairobi Biotechnology Centre, JomoKenyatta University institute of biotechnology, KIRDI, Deutsche Sammlung von Mikroorganismen und Zellkulturen – (DSMZ) and Verenium Corporation. The project has strong involvement of local competent national institutions unlike the previous arrangements where KWS was the only local institution. The involved partners have had experience and engagements on Bioprospecting for useful microbial based genetic resources from the soda lakes. The KWS/ICIPE/Verenium Corporation (f.k.a Diversa) program was involved in the collection of environmental materials including isolation of extremophilic microorganisms, both culturable and unculturable. The pre-processed microbial samples were being shipped to Verenium for further analysis. These samples are still under development to industrial products in Verenium Corporation. As a result, a microbial collection was generated and is currently under ICIPE. Under the Kenyan law, these collections are supposed to be held in a designated National institution. Kenya government, through the National Council of Science and Technology has designated JKUAT to establish a pilot national microbial culture collection centre in partnership with KWS and NEMA. In addition, NCST has supported JKUAT IBR to undertake various Soda lakes microbial research projects. JKUAT through its Institute of Biotechnology (IBR) is actively involved on research and development of microbial genetic resources from the soda lakes in collaboration with DSMZ. The IBR hosts the proposed pilot microbial culture collection centre. The centre has a laboratory space with basic equipment for molecular work. They have experienced microbiologists and technical staff. KIRDI is a government institution designated for industrial research and also advice the government in the related field. Currently, KIRDI is actively involved in development and quality control of various industrial enzymes including detergents. Together with local Universities and Verenium, KIRDI will undertake pilot production of talented microorganisms for industrial enzymes and other products.

The University of Nairobi biotechnology centre is actively involved in microbial Bioprospecting for industrial enzymes. They have competent biochemists and equipped laboratory for industrial enzyme research and development. Currently, the University of Nairobi under the Bio innovate Programme and the APROPOS EU project are generating basic data on: i) scale-up productions of different industrial enzymes using solid state and sub-merged fermentations; ii) scale-up of downstream processes and optimizing methods of enzyme stabilization; iii) collaboration with local industries to evaluate different enzymes under actual industrial application conditions; iv) evaluation and characterization of selected biomass streams to be used as raw materials for the production of value-added products using enzymes. The JomoKenyatta University of Agriculture and Technology has been working under the Bioinnovate Programme to reduce the impact of biotic and abiotic impacts in crops for the benefit of poor farmers using microbial bio-pesticides. Moi University through its company, Rivatex has committed to utilize the developed technologies for textile production. The University has committed USD 250,000 to support this project. .

Since pioneer ABS projects and experience from biopiracy on Kenyan genetic resources, Kenya government through KWS has put in various strategies towards effective Bioprospecting within protected areas. In 2009, KWS in partnership with various USA and UK government departments organized an international conference on sustainable utilization of the country's biodiversity with more focus on Bioprospecting. In 2011, KWS organized a high level

delegation to USA and Costa Rica on a fact finding mission towards developing effective Bioprospecting legislation for sustainable use of biodiversity and equitable benefit sharing. With support of USAID, Kenya government through KWS, based on Bioprospecting experiences developed and launched a national strategy for Bioprospecting within and outside protected areas. The total investment from USAID was US\$ 50,000. KWS together with stakeholders are developing a benefit sharing plan on utilization of genetic resources for research and development within protected areas. In 2012, KWS brought together local community representatives around the soda lakes on awareness creation on the value of the soda lakes microbial genetic resources at a cost of US\$ 15,000. Currently, KWS is undertaking community biodiversity benefit needs assessment around soda lakes, to establish existing structures and channel for benefit sharing with local communities in respect to utilization of genetic resources for research and development. A platform for benefit sharing on utilization of genetic resources from soda lakes for research and development is being established. This will link up with the National Bioprospecting steering committee and ensure that benefits are equitably shared with stakeholders and local communities for enhanced conservation and livelihood improvements. This is part of the GEF NPIF soda lakes project stake holder preparations.

The Kenya government has just enacted a new constitution which lays emphasis on access and benefit sharing on utilization of her genetic resources. Also, the country has a framework ABS law which is to be reviewed in line with the constitution and emerging issues of the Nagoya protocol. The country has signed the Nagoya protocol and is in the process of ratifying it. Therefore, the soda lakes microbial project is being developed as a model ABS partnership addressing the aspects of Nagoya protocol in relation to PIC, MAT and MTA, linking the provider and user. The GBDI/IOCD involvement in the project will be useful towards developing effective Bioprospecting laws through sensitization of high level government officials including cabinet secretaries from relevant line ministries based on their previous experience. Whereas the project partners have been working based on previous agreements, this will be reviewed in line with the country's constitution and the Nagoya Protocol to lay a framework for effective implementation of the soda lakes activities. The soda lakes project partners have generated a wealth of experience including useful microorganisms that are held in various collection centres. It is a government requirement that microbial collections be deposited in a designated depository centre to promote effective research and development in line with the Nagoya Protocol. These microorganisms and the isolated enzymes will be used for the bio discovery programme. It is also noted that previous Bioprospecting on useful microorganisms from the soda lakes have not been systematic. The proposed systematic bio discovery may lead to identification of new talented strains and products of industrial potential.

Strengthening protected area systems as ABS focal points has been recommended as the most appropriate way to realize the three objectives of the CBD and the Nagoya Protocol of benefit sharing. The resultant benefits will directly be channelled to biodiversity conservation and other relevant national development agenda. Therefore establishing centres of excellence in protected areas will act as a platform for technology transfer and benefit sharing. This is evident in Costa Rica through INBio and the current benefit sharing strategies in USA National parks. Costa Rica has an elaborate biodiversity informatics which informs conservation strategies and Bioprospecting within the country. This biodiversity informatics system has been recommended for Kenyan protected areas. The system will assist to put in place mechanisms for establishing status of isolated microorganisms and other biological species from the soda lakes.

Effective community structures around the soda lakes are critical for the success of the project. With the enactment of the new constitution, there are many changes on biodiversity resource management in the country. Most of the soda lakes are either under national parks or national reserves. Whereas some of the national reserves were previously co-managed with the county councils, currently they are under the national government as per the constitution. Modalities are being worked out to enhance collaboration between county government and national government on management of jointly managed national reserves. The streamlining will include effective joint management plans that recognize local community benefits. In some of the national reserves like Lake Bogoria, the county government collects revenue resulting from tourism which is shared with local Endorois communities. Therefore, construction of nature trails will contribute to increased tourism and enhance revenue to local communities. Currently, there are no royalties resulting from utilization of genetic resources for research and development that have been shared among stakeholders including local communities within the soda lakes. However, there are some non monetary benefits that are now being realized after the awareness creation where capacities of local communities are being enhanced for monitoring of the indigenous resources. The support of GEF on nature trails to enhance tourism, improving community structures and

share of royalties that may result from the project meet the constitutional requirement and Nagoya Protocol on sustainable biodiversity utilization and equitable benefit sharing, for both national and local county government.

GEF funds will be useful in supporting the country's ABS legislative processes, facilitating development of ABS based agreements for the soda lakes partners, enhancing the proposed microbial culture collection centre at Jomo Kenyatta University, infrastructure for research and development to enhance microbial product development and marketing in liason with private partner and bioinformatics in support of wildlife conservation in line with the Nagoya Protocol. The GEF funds will also be used to improve community capacity through education and awareness and also support construction of nature trails around the selected soda lakes, and also contribution to joint management plans which will improve tourism therefore enhancing benefits to the community.

## **B2. Incremental /Additional cost reasoning**

The project is aimed at developing industrial products from the soda lakes microorganisms for use in seed and seedling and post harvest applications and industrial enzyme solutions for use in agro-processing, starch, biofuel, textile, food and beaverage and protein hydrolysis. This will be carried out in partnership between provider and user based on appropriate ABS model informed by the Kenyan law and relevant international biodiversity multilateral agreements, more specifically the Nagoya protocol. This partnership will involve the providers (KWS and the local communities), the users represented by research institutions (UoN, JKUAT, Moi University, Rivatex and KIRDI), DSMZ for culture collections and private partners represented by both local (University of Nairobi Science and Technology Park and the JKUAT Enterprise Ltd), international companies (Verenium Corporation), IOCD and GBDI in an ABS model of fair and equitable benefit sharing. Over the years, University of Nairobi Center for biotechnology and JomoKenyatta University institute of microbiology in partnership with various institutions have been bioprospecting for useful microorganisms from protected area systems under KWS. University of Nairobi under Professor Francis Mulaa have build competence in microbial industrial enzyme discovery and development and will provide appropriate platform for enzyme discovery and optimization in liason with the industrial partner within the project framework. Professor Hamadi Boga through JomoKenyatta University's IBR centre will play a critical role in microbial isolation, characterization and storage. Professor Hamadi Boga over the years built the capacity of IBR centre of JKUAT and currently has a team of researchers ranging from undergraduate, Masters and PhD students undertaking studies in microbial research and development in partnership with DSMZ. The JKUAT has basic equipment for microbial and molecular work including DNA extraction and amplification. The local participating universities have established spin off companies (University of Nairobi Science and Technology Park and the JKUAT Enterprise Ltd) which act as incubators for their industrial innovations and a platform for technology transfer. Dr. Moses Makayoto is a chief scientist at KIRDI and the head of technology transfer who over the years has been involved in industrial enzyme formulations for textile, detergents and crop biopesticides. The University companies and KIRDI in partnership with Verenium will upscale the developed industrial products to commercial level within the defined soda lakes framework. Rivatex East Africa Ltd is a textile manufacturing industry and is one of the oldest industries located in Kenya. Rivatex is a Moi University facility for Research, Product Development, Extension and Production. Rivatex focuses on meeting the customers' needs, through provision of unparallel quality textiles and continue to improve their market niche both locally and internationally. The company will use the developed enzymes to enhance quality of their textiles.

Deutsche Sammlung von Mikroorganismen und Zellkulturen – (DSMZ) is one of the leading microbial culture collection centres in the world. They have an elaborate system for microbial sampling, identification, storage and exchange. They have trained many Kenyans at graduate level. DSMZ has a working framework with JKUAT under the DAAD program on microbial studies in the soda lakes and have been acting as depository of isolated and identified microorganisms collected from protected areas. Funds under DAAD program will support graduate students working on novel soda lakes microorganisms as well as travel for DSMZ personnel involved in this project. Professor Jorg Overman incharge of DSMZ is committed to the successful implementation of the project. Already, KWS has initiated collaborative arrangements with DSMZ to act as the international depository for microorganisms isolated from protected areas. These arrangements will be harmonized within this soda lakes framework. DSMZ will provide technical advice and improve capacities of both infrastructure and skills for the proposed pilot microbial culture collection at JKUAT which will be a national reference of living culture collections. The GEF funds will be used to support development of the pilot culture collection at JKUAT.

Verenium corporation has a wide experience on bioprospecting for useful industrial enzymes from genetic resources found within protected areas. Case examples include bioprospecting programs in USA Yellowstone National Park, Protected areas in Kenya and Costa Rica. Verenium corporation is the main industrial partner and will undertake technology transfer on sampling, storage analysis and scale-up of developed technologies to industrial production and marketing. Therefore the company will share out monetary and non monetary benefits in terms of capacity building and royalties within the soda lakes framework that will support livelihood and biodiversity conservation. Verenium Corporation brings into the partnership advanced technology and marketing skills necessary to perfect and commercialize the derived products. Technologies for product development and marketing required for industrial transformation in this sub sector are lacking in Kenya and partnership with Verenium Corporation will be quite usefull.

Most of the soda lakes are managed through joint management plans where the local communities have a clear role on decision making in respect to resource use and derived benefits. Through this management committees and the proposed soda lakes platform together with Wildlife management authority, the local communities will be involved in granting of Prior Informed Consent (PIC) for microbial genetic resources in accordance with the appropriate laws of kenya and the property rights system observed in Kenya. Appropriate ABS agreements will be developed including the county government and local communities with clearly defined Mutually Agreed Terms (MAT) and Material Transfer Agreements (MTA) stating contributions to conservation, sustainable use and equitable benefit sharing. In addition, through the GEF funding, effective community structures around the soda lakes will be established.

Clear and effective legal system are key ingredients for a successful bioprospecting venture. This was realized by IOCD sometime and since 1998, they have been actively involved in promoting appropriate legislative framework for bioprospecting on the rich Kenyan biodiversity. The Kenya government has just enacted a constitution which gives framework on sustainable biodiversity utilization and equitable share of resultant benefits. Also, the country has an ABS framework which is in the process of being reviewed to realign with the constitution and the Nagoya Protocol. IOCD/GBDI within this shared vision for effective bioprospecting legislation will play critical role in capacity building of senior government officials and members of the cabinet through sensitization under this project.

For the project to be viable, elements of sustainability are critical. These have been considered within the projects lifespan and beyond, which include the exit strategy after the GEF funding. Most projects are not sustainable due to lack of appropriate exit strategy. The government support is a key element of the exit strategy. This project has been prepared in line with rellevant government strategies, policies and legislations. It also builds on on-going initiatives by the partners. Endorsement in support of the project by the ministry of environment shows the government committment to the project. The initaitive by the government to establish a pilot microbial depository at JKUAT will be usefull for the soda lakes project. Soda lakes initiative is in line with the Kenya governments Vision 2030 blue print for industrial transformation focusing on utilization of the soda lakes microbial genetic resources through research, development and commercialization. Elements of bioprospecting have been included in the revised Wildlife Act. Kenya government, with support of USAID has just developed a USD 100 million five year strategy for bioprospecting within and outside protected areas. This strategy gives the road map for bioprospecting in the country as part of realignment to the Nagoya Protocol. The strategy focuses on streamlining ABS issues on utilization of genetic resources within and outside protected area systems. Among them is the establishment of a multi disiplinary national bioprospecting steering committee under the Wildlife Act. The National Economic and Social Council (NESC), chaired by the president which is the main driver for Vision 2030 has recently recommended bioprospecting as one of the National flagship programs that requires consideration.

The soda lakes project has various components ranging from community governance, resource management, research and development among others which may be supported by various actors during and after the project period. The institutions involved namely government (KWS, KIRDI, NEMA, UoN, JKUAT), local communities, DSMZ and the private company Verenium Corporation are competent, have a wealth of experience and are committed to successful implementation of the soda lakes during and after the lifespan of the project. In addition, these institutions have had related microbial projects within the soda lakes. The GEF NPIF project is timely to support the government initiatives on the utilization of genetic resources for industrial transformation in compliance with the Nagoya Protocol. The GEF investment is critical for the success of the partnership between the private sector, local research institutions, protected area management and local communities in an ABS Nagoya compliant manner. Access and Benefit Sharing projects are affected by heavy investments on research and development where most industrial partners are unable to sustain

the costs. The GEF investment will contribute towards development of effective bioprospecting platforms and also provide venture capital for the soda lakes microbial product development and commercialization within the projects framework. The benefits thereof that is both monetary and non monetary will be realized on short and long term basis. The project will form part of best model examples to be used for effective biodiversity based policy and legislative development.

**Component 1: To enhance the legal and regulatory framework on ABS in Kenya**

The countrys constitution and other minimum standards set out in the legal provisions namely: EMCA 1999, ABS laws, Wildlife Act Cap. 376, the strategy for bioprospecting within and outside protected areas in Kenya will form basis of the GEF – NIPF project. Stengthening of the legal framework on ABS will be undertaken by KWS and NEMA in partnership with IOCD and GBDI with the support of UNEP DELC. The GEF funds and IOCD/GBDI will be used to facilitate sensitization of key government sectors on bioprospecting and review of the existing ABS laws.

**Outcome 1.1. Policy, legal and regulatory frameworks on the country’s ABS reviewed in compliance with the provisions of the Nagoya Protocol**

***Output 1.1.1: Review of existing legislation that govern conservation and sustainable use of genetic resources in light of the implementation of the case study of this project***

Clarity in legal system and need for effective legislation that attract investment in biodiversity to accelerate economic growth has been singled out as critical for any succesful bioprospecting venture. Already, the Kenyan government is putting in efforts to review and realign relevant policies, legislations and adminstrative structures in line with the consitution and the Nagoya Protocol. Resource management within the soda lakes are governed by various statutory provisions which may affect sustainable utilization of the soda lakes microbial genetic resources through research and development. Laws governing resource ownership, access and utilization including stakeholder arrangements will be reviewed in accordance with the ABS provisions within the constitution and in line with the Nagoya Protocol. This will be through stakeholder analysis, consultative processes both at county and National government levels. The GEF funds will facilitate the country’s ABS stakeholder analysis and consultative processes.

The GEF funds will be used to support the NEMA and KWS to review governance structures and stakeholder analysis within the soda lakes for effective resource utilization and equitable sharing of resultant benefits. Also, GEF funds will be used to review the existing agreements between the soda lakes project partners to harmonize them with the provisions of the National laws and the Nagoya Protocol. The participating local Universities have had collaborative agreements with various institutions both locally and internationally for example University of Nairobi on APROPOS program and BioInnovate and JKUAT with DSMZ, KWS with Verenum, which will be harmonised within the GEF soda lakes project.

***Output 1.1.2: Reviewed ABS legislation in light of this project presented to County and National governments to facilitate ratification and implementation of the Nagoya Protocol;***

The effectiveness of the current Kenyan ABS has been discussed in different expert workshops of which various recommendations have been made. Some of the recommendations include the need to review the existing ABS in line with the current consitution and the Nagoya Protocol. IOCD and GBDI have been working with protected area system for quite some time through capacity building in education awareness creation towards development of effective biodiversity legislations. IOCD personnel together with KWS, NEMA and NACOST (f.k.a NCST) and UNEP will organize for one sensitization workshop bringing together relevant Count Government representatives, local communities, policy makers, members of parliament responsible for environmental issues, researchers and industrialists to brainstorm on effective national legislations for bioprospecting and need to fast track ratification of Nagoya Protocol. The funds from GEF and government support will be used for the sensitization processes.

***Output 1.1.3: At least two joint management plans for the selected soda lakes developed that factor in aspects of benefit sharing from use of genetic resources for research and development;***

Effective resource management structures have been identified as key to realization of derived benefits from biodiversity and in particular where resources are managed by various stakeholders. Natural resource management

plans define clear roles of stakeholders and also benefit sharing arrangements and will be major entry points on community benefit sharing and poverty alleviation strategies. Some of the Kenyan soda lakes for example Lake Bogoria, Elementaita and Nakuru are now designated as World Heritage Sites and management plans are being developed or revised. The lake Bogoria management plan expired in 2012 and is due for development. Therefore, factoring in elements of the Nagoya Protocol for access and benefit sharing within the management plans for the soda lakes will contribute to the success of the project. The management plans will also consider gender mainstreaming where all user groups will be brought on board. The GEF funds will be used to supplement the government efforts and support at least two management plans for the identified soda lakes. The key actors will be KWS, County Governments, participating local communities and relevant stake holders.

### **Outcome 1.2: ABS institutionalized in protected areas as a tool for enhanced conservation and livelihood improvement**

Institutionalizing and strengthening ABS within protected area systems is key for realization of Nagoya Protocol on access and benefit sharing and the three objectives of the CBD. Already protected area systems are putting initiatives towards development and implementation of PIC, MAT, MTA and bioinformatics as part of Nagoya Protocol checkpoint requirements in line with national laws. These has to be streamlined in all cartegories of protected area system ranging from communal to national government.

#### ***Output 1.2.1. A National bioprospecting steering committee under the National strategy for bioprospecting within and outside protected areas in Kenya established to promote bioprospecting in the soda lakes***

As part of implementation of the Strategy for bioprospecting within and outside protected areas, it has been proposed to have a multi disciplinary national steering committee comprised of representatives from community, private sector, legal, policy makers among others to guide implementation of bioprospecting within protected areas. The committee will among other roles advice the government, over see the implementation of bioprospecting activities, establish appropriate policy framework, identify key projects, including microbial industrial development within the project study area among others. The strategy proposes establishment of the bioprospecting steering committee under the Wildlife Act. The GEF funds will support the Ministry of Environment and Natural resources and KWS to establish and operationalize the National Bioprospecting committee.

#### ***Output 1.2.2 Protected area management capacities on ABS enhanced through education and awareness for sustainable use of soda lakes genetic resources in line with the Nagoya Protocol;***

Systems for protected areas to act as ABS checkpoints for effective realization of Nagoya Protocol are still wanting. Streamlining ABS systems into the protected areas system has been affected by the lack of appropriate outreach programmes in education and awareness for relevant stakeholders including local communities and County governments. Streamlining ABS within protected area through clear systems of Prior Informed Consent, Benefit sharing plans, Material Transfer Agreements and Mutually Agreed Terms is essential in optimizing benefits from biodiversity in line with the national laws and the Nagoya Protocol. Effective outreach program will depend on the clear understanding of stake holder dynamics within the soda lakes project. KWS has initiated an area wide ABS awareness sensitization activities within the soda lakes areas. In 2012, KWS brought together local communities, county government and relevant stake holders within the selected soda lakes to brainstorm on issues of benefit sharing arising from the use of genetic resource for research and development. The GEF funds will support the KWS initiative and NEMA to streamline stakeholder dynamic processes and establishment of effective outreach program with dissemination materials which will contribute to the successful implementation of the project.

#### ***Output 1.2.3 Tools for monitoring impact of Bioprospecting projects on conservation and community livelihoods established and operationalized;***

Bioprospecting has been recommended as an alternative that can lead to effective conservation through appropriate biodiversity benefit sharing arrangements. While many bioprospecting activities have been undertaken, there are no systems for monitoring and evaluation of the impacts on biodiversity conservation and livelihoods. Part of the benefits including royalties can support various community initiatives such as food security, education programs, capacity building through infrastructure, training and generation of scientific information which can lead to informed decision making. The GEF funds together with government support will assist protected area management system and NEMA



put in place appropriate tools to monitor the impact of the project and other bioprospecting activities within the soda lakes to conservation and livelihood improvements.

***Output 1.2.4 Infrastructure within the soda lakes to enhance research and tourism (e.g Nature trail in Lakes Bogoria, Elementaita and Simbi Nyaima) for KWS and adjacent communities improved;***

Construction of nature trails around the selected soda lakes will contribute to increased tourism and control research activities within the sites. Most of the soda lakes have no nature trails and this has caused problems to tourists and also researchers as some areas could be risky. The trails will minimize the risk of local community members, tourists and bioprospectors visiting the lakes from falling or coming in contact with the hot geysers. The trails will add value to the soda lakes and increase revenue generation through tourism which partly will also support community livelihoods through the existing benefit sharing arrangements. Funds from the GEF Project will support KWS and local communities for construction of the trails around selected Soda lakes. These will form a foundation for the establishment of similar facilities around important biodiversity areas around the country and also a negotiation tool to conservationist to funding similar activities.

## **Component 2: Systematic discovery of natural products for bio-pesticides and industrial enzymes**

Enhancement of research and development of the country's genetic resources is key to her industrial transformation as stipulated in the Vision 2030. Previous bioprospecting activities for valuable microbial genetic resources within the country's soda lakes have yielded products of commercial value some of which are on the market. Screening and purification of target enzymes and secondary metabolites for industrial application in agro-processing, starch and fuel, horticultural, textile, food and beverage industries will demonstrate the potential of the soda lakes microorganisms contribution to the country's national goals through industrial transformation. The project will build on upscaling already identified microorganisms with industrial potential from previous undertakings and also on new collections through the systematic biodiscovery program. There are various potential industrial enzymes and secondary metabolites that have been identified at the University of Nairobi and Jomokenyatta University which will form the initial basis of upscaling for industrial production. The systematic biodiscovery program will reveal new potential microorganisms from the soda lakes. This will further be developed into commercial products with the help of the industrial partner, Verenum Corporation. The process will include field sampling, isolation and identification of candidate organisms both at JKUAT and UoN, further screening at Verenum corporation, development and optimization of technologies at Verenum. Sample movement will be controlled through PIC, MAT and MTA. All identified microbial isolates will be deposited at JKUAT and duplicates at DSMZ as defined by the PIC and MTA. In addition, samples to Verenum for industrial screening will be through an MTA where duplicates will be kept at JKUAT microbial culture centre. KIRDI will partake in pilot production of identified industrial products. Therefore the project brings on board competent partnership represented by Verenum Corporation, USA, as the industrial partner for development and commercialization of industrial enzymes, KIRDI as the government industrial agency for upscaling potential technologies, representative Kenyan Universities (UoN, UoN technopark, JKUAT and JKUATse) with their technoparks for research and product development. Capacities of local researchers and scientists from protected area will be enhanced in terms of sampling and monitoring techniques of soda lakes microbial resources. DSMZ together with local partners will spearhead the establishment of the country's living library of microbial culture collection at JKUAT. There will be need to bring all the proponents together and work out an effective agreement to execute the project. The GEF funds will facilitate the development of MAT through an agreement between the project partners which will spell out roles and benefit sharing arrangements during and after the project.

**Outcome 2.1: At least 1 potential microbial isolate characterized and deposited at the Culture Collection Centre at Jomo Kenyatta University of Agriculture and Technology (JKUAT) and the German Collection of Microorganisms and Cell Cultures (Deutsche Sammlung von Mikroorganismen und Zellkulturen – DSMZ)**

***Output 2.1.1 At least 500 samples collected at different seasons from the Soda lakes and 20 pure strains isolated with cellulase, protease and Phytase activities for agro-processing, starch and fuel, textile, food and beverage and protein hydrolysis and deposited in culture collection centers at JKUAT and DSMZ;***

Isolation and screening of microorganisms from the soda lakes has been going-on in the country with a number of studies being undertaken by university students, both undergraduate and postgraduate. The salinity of the Kenyan Soda lakes is known to change with seasons and no studies have been undertaken systematically to isolate the different microorganisms present at the different conditions for industrial applications. These may reveal new industrial

applications from the isolated microorganisms. The industrial partner, Verenium Corporation has developed technologies for sampling, storage and processing of valuable genes from microbial genetic resources. This techniques together with those developed at DSMZ will be useful in the soda lakes microbial biodiscovery and commercialization program. The isolation and screening of the soda lakes microorganisms will be undertaken in laboratories of the UoN and Verenium Corporation, while JKUAT and DSMZ will characterize and deposit the identified microorganisms at their respective culture collection centres in compliance with the Nagoya Protocol. Funds from GEF will support project partners in systematic sampling, isolation, screening, development and maintenance of the germplasm in Kenya based at JKUAT. Verenium Corporation will commercialize the developed industrial enzymes and share benefits within the soda lakes project framework.

***Output 2.1.2 At least 5 isolates producing bioactive secondary metabolites as biopesticides for seed and seedling treatment characterized and deposited in the culture collection centres in JKUAT and DSMZ***

Seed companies incorporate protocols for seed/seedling bio-enhancement for commercial nurseries and farmers to enhance seed viability and production of clean planting materials. Farmers combine quality planting material with post harvest treatment to maximise yields. Screening of the collected samples for potential microbial candidates for biopesticides will be undertaken and the talented strains will be selected for further development. These will be undertaken by KIRDI and JKUAT. Already, baseline information on the potential of Soda lake microorganisms is being generated by the Jomokenyatta University of Agriculture and Technology and partners through the Bioinnovate project on the production of seed and seedling products. The GEF funds will be used for industrial up-take of this technology through the JKUAT Enterprises Ltd.

***Output 2.1.3 Status of microbial strains in culture collection centre's at JKUAT and other partner institutions established and over 200 microbial isolates screened for cellulose degrading and enzyme for detergent and cotton processing***

Earlier studies on isolation of microorganisms from diverse environments within protected areas in Kenya including soda lakes have been undertaken at individual institutional levels resulting in the generation of collections of microorganisms. Some of these include those that were initiated by ICIPE/KWS/DUPONT, ICIPE/KWS/DIVERSA Project collaborations which have ended and the Bioinnovate, EU-FP7 programmes which together have led to isolation and preservation of about 3000 strains of microorganisms. The status will be assessed by scientists from protected area system and JKUAT. Funds from the GEF Project will be used to revive the cultures stored at individual institutions, undertake taxonomic identification, screening for industrial applications and duplicates preserved at JKUAT and DSMZ for future use. Screening for potential industrial products and eventual commercialization will be undertaken by the local project partners, DSMZ, Germany and the main industrial partner, Verenium Corporation, USA.

**Outcome 2.2: At least 1 enzyme product developed for agro-processing, starch and fuel, textile, food and beverage industries by the participating Kenyan institutions and the private company (Verenium corporation);**

***Output 2.2.1 Optimization of fermentation conditions for large scale production of cellulases, proteases and phytases for industrial production***

The current methods of extracting bioactive enzymes from microorganisms involve the traditional small scale fermentations using shake flasks in shaker incubators. For industrial application processes, these methods are unreliable and therefore the need for a bioprocess technology which can guarantee a continuous supply of the industrial material. The research partners (KWS, UoN and JKUAT) and the University of Nairobi Science and Technology Park Ltd and KIRDI will together develop the industrial enzyme production processes where the industrial partner, Verenium Corporation will evaluate the potential products and optimization of the industrial enzyme production processes. The funds from GEF-NPIF will facilitate the scale-up of the process for industrial application.

***Output 2.2.2 Formulation and evaluation of the produced enzymes for application in starch and fuel, textile, food and beverage industries in together with the local (University of Nairobi Science and Technology Park, Kirdi and Rivatex) and international private company, Verenium Corporation;***

The cellulases, proteases and phytases will be produced in a pilot plant and tested as feed additives, textile processing and biofuel production by KIRDI and the University technoparks (University of Nairobi Science and Technology Park

Ltd and the JKUAT Enterprises Ltd ). Verenium Corporation will upscale and commercialize the incubated products from the local companies through the established agreement. The GEF funds will be used for pilot production and evaluation of the developed products for commercialization within the Kenyan institutions while Verenium will use their funds to up-scale within their industrial set-ups.

**Outcome 2.3: At least 1 biopesticide for enhanced seed and seedling treatment developed by the participating Kenyan institutions and the private companies (University of Nairobi Science and Technology Park and the JKUAT Enterprise Ltd)**

***Output 2.3.1 Optimization of fermentation conditions for large scale production of bio pesticides for industrial production***

Detailed protocol for recovery and formulation of biopesticides will be carried out by scientists from KWS, KIRDI, JKUAT and the University of Nairobi biotechnology centre in collaboration with the private partners. The fermentation technology used by Verenium Corporation for their industrial enzyme solutions will be employed for mass production of talented microbes with biopesticide potential. Data on biopesticide recovery, its cost effectiveness and stability of the biopesticide under storage and application conditions will be generated. This will guide the industrial production and commercialization of the final product. The GEF funds will be used to generate performance data for the bio pesticide under actual application conditions.

***Output 2.3.2 Formulation and evaluation of the produced bio pesticides for application in the seed and horticulture industry together with the private companies (University of Nairobi Science and Technology Park and the JKUAT Enterprise Ltd)***

The bio-pesticides will be produced in a pilot plant and tested as seed and seedling coating and post- harvest treatment by the private partners (University of Nairobi Science and Technology Park Ltd and the JKUAT Enterprises Ltd) and KIRDI. Dr Makayoto of KIRDI has a wealth of experience in screening and developing microbial biopesticides, some of which are already on the market. Therefore the project will tap on the capacity of KIRDI and JKUATes on development of industrial biopesticides. The GEF and the private partner funds will be used for pilot production and evaluation of the developed products for commercialization.

**Outcome 2.4: A living library of Kenyan Soda lakes microorganisms established at JKUAT**

***Output 2.4: Culture Collection Center at Jomo Kenyatta University of Agriculture and Technology (JKUAT) upgraded to a national culture collection to support discovery of potential Soda Lakes microbial products;***

Microbial cultures isolated previously from soda lakes and other environments are preserved at different laboratories including the culture collection centre at JKUAT. For industrial applications, the candidate microorganisms will require proper storage in a designated depository. The Government has initiated a microbial culture collection to be hosted at JKUAT. JKUAT is also a member of the global microbial culture collection network and have a working framework with DSMZ. The GEF and DSMZ funds will be used to upgrade the culture collection centre at JKUAT to a National designated culture collection centre for industrial microorganisms and other general purposes.

**Component 3: Technology Transfer between resource provider and user operationalized**

In order to negotiate technology transfer between private partners, researchers, protected area system and local communities on identified potential microbes, processes and products for industrial application, technology transfer policies and offices in partner institutions in compliance with the Kenyan constitution and the Nagoya Protocol will be established. This will involve training in technology transfer audits and appropriate technology transfer of required technologies from the private sector to research/academic institutions. Technologies will be transferred with the use of the ABS instruments including Material Transfer Agreements between the participating institutions (KWS, KIRDI, JKUAT, UoN, DSMZ, local communities and Verenium Corporation). DSMZ will be very instrumental in transferring the technology for microbial culture collection, and preservation both for patent and safe deposit. Verenium Corporation will equip the protected area management with sampling and monitoring technology for microbial resources within protected areas. In addition, Verenium will transfer technologies on microbial fermentation technologies, product development and upscaling of promising technologies and commercialization. The GEF funds will be instrumental in facilitating technology transfer both from DSMZ and Verenium Corporation to Kenyan institutions.

### **Outcome 3.1: Technology transferred (including equipment, know-how and training) from DSMZ and Verenium Corporation to local research institutions and protected area systems management**

#### ***Output 3.1.1 Bioprocess technology for efficient secondary metabolite production from soda lake microorganisms in place***

The value chain for the bioprocess technology (biopesticide/enzyme) consists of: i) applied research ii) regulatory services iii) production companies iv) private and v) consumers. The research institutions represent i, iii and iv above. Development and promotion delivery partners represent i and ii. The consumers (v) will be reached through links with iv and complimentary instruments. Verenium Corporation have developed cutting edge technologies for bioprocessing and optimization of enzymes and secondary metabolites which have been protected through patents. The various technologies will be transferred to research institutions and resource managers to enhance research and development and conservation of the soda lakes through appropriate partnership agreement. GEF and matching funds from the private sector will be used for this purpose.

#### ***Output 3.1.2 Improved skills and facilities at the initiated Kenya microbial Strain Depository at JKUAT to serve as a repository for microorganisms and also as a patent deposit***

On-going microbial research activities within the soda lakes have largely involved training of students from different fields including microbiology, bioinformatics/biochemistry and chemistry. Storage and preservation of microorganisms isolated both by students and researchers is currently held in various institutions among them JKUAT and DSMZ in Germany. This will be streamlined within this project were characterized and identified microbial strains from the field collections will be deposited at the JKUAT culture collection centre and duplicates in DSMZ based on approved project protocol on PIC, MTA, MAT. There is already a JKUAT/DSMZ/KWS initiative on culture collection and mechanisms are already in place to establish a National microbial Bioresource centre. This initiative will be harmonized within the soda lakes partnerships and through this, DSMZ will provide expert training for establishing the gene banks for culture collections. The genebanks will be managed according to strict scientific standards to maximize their value for conservation purposes. Kenyan personnel will be trained on Standard Operating Procedures for identification, documentation and management of microorganisms for storage in a culture collection at JKUAT centre. In addition, an efficient information management system will be established for management of the living library of microbial culture collection. Capacity development on integrated conservation management will ensure that *ex-situ* collections will support *in-situ* conservation, through habitat restoration and species recovery. The GEF grant will be used for training in cataloging, indexing and maintenance of the culture collection facility and establishing a system of access and transfer of culture collections based on the Nagoya Protocol. These will be used as a model for legal framework on establishment of culture collection centres in the country based on established protocols and standards.

#### ***Output 3.1.3 At least 1 technology registered with the Kenya Industrial Property Institute (KIPI)***

The systematic discovery of natural products for bio-pesticides and industrial enzymes will result into various proprietary technologies for protection through appropriate intellectual property rights (IPR) system. Ownership and protection with the resultant IPR will be determined by the developed Mutually Agreed partnership agreements. At the end of the project, atleast one industrial technology for production of biopesticides and enzyme solutions from the soda lakes microorganisms will be protected through the Kenya Industrial Property Institute (KIPI) and other relevant designated IP institutions. The protected technologies will jointly be transferred by local partners and the industrial partners for commercialization as stated within the projects agreements. The GEF grant and private sector funds will be used to for technology registration and transfer for commercialization.

#### ***Output 3.1.4 At least 1 product successfully transferred to the private partner and commercialized;***

The project partners hope to have at least one talented microorganism for production of desired industrial enzyme and biopesticide, a purified industrial enzyme for biofuel, starch and textile industry and purified compound for biopesticide production. Either the enzyme or compound with the potential of industrial application will be chosen as a model for commercialization in an ABS compliant manner by the project partners. The GEF grant together with private sector support will be used for development of economic models for commercialization and further development to meet the prevailing market needs.

### **Outcome 3.2: An effective bioinformatics system in Kenya at KWS for Soda lakes microbial discovery to act as a system for monitoring and evaluation established**

There are initiatives by various bodies to consider protected area systems as ABS focal points and centres of excellence in bioprospecting. Among these bodies include IUCN under the protected area system ABS initiative program. Smithsonian institute is developing a bio-informatic system for CITES listed specimens to enhance wildlife law and enforcement. Various types of bioinformatic systems and tools are being developed for data management to enhance conservation and sustainable use of biodiversity. The visit by KWS to Costa Rica on bioprospecting fact finding mission found an elaborate bioinformatics system at INBio which is relevant to protected area system. The KWS will like to develop a similar system found in Costa Rica for protected areas to support biodiversity conservation and bioprospecting initiatives. The GEF funds will be used to develop a bioinformatic system for the Soda lakes microorganism to be based at KWS.

#### ***Output 3.2.1 Data handling system on collection and transfer of biological specimen within and outside Kenya established;***

We have on going collections of specimens from both within and outside protected areas for scientific and bioprospecting purposes. Currently, protected area systems do not have clear structures for monitoring collections and transfer of specimens as stipulated in the Nagoya protocol. Kenya Wildlife Service has initiated a system of data handling of accessed biological specimen from protected areas. Currently, research on microbials from the soda lakes contribute to a high percentage of specimen collection within protected areas. Verenum Corporation and DSMZ will assist protected area system to develop appropriate mechanisms for data handling and transfer of microbial biological specimens from the soda lakes. This system will be upscaled to other collections within the protected areas. This will be an important tool for monitoring of specimens collected and transferred both within and outside Kenya. The GEF funds will be critical in facilitating establishment of appropriate data handling system on collection and transfer of biological specimens in protected areas. This is perceived to be in compliance with the Nagoya Protocol to enhance monitoring, evaluation, enforcement and compliance tracking system.

#### ***Output 3.2.2 A well equipped bioinformatics centre established at KWS***

Previous bioprospecting activities within the soda lakes in the country have resulted in the generation of a large database of microorganisms which are stored in partner institutions including the ICIPE/KWS/Dupont, ICIPE/KWS/Verenum, JKUAT/DSMZ. Conservation areas have not had a proper system of monitoring materials taken for bioprospecting activities. The established bioinformatics facility will be useful in keeping data on all microorganisms collected using unique identifier system. This will supplement the on-going effort by the wildlife service to establish barcoding system for all wildlife specimen accessions for research and development including forensics in law and enforcement. The GEF funds will be used to establish and equip the bioinformatics facility at KWS.

### **Component 4: ABS agreements developed to build the capacity of the Kenyan authorities to engage with users of genetic resources**

Previous benefit sharing agreements in Kenya were negotiated based on the provisions of the CBD which did not provide indepth details on access and benefit sharing but rather provide broad guidelines to be followed. With the adoption of the Nagoya Protocol, clear and precise guidelines are required for access and benefit sharing agreements involving the utilization of genetic resources and associated traditional knowledge. Funds from GEF– NPIF will be used to negotiate and develop appropriate ABS agreements between the private sector, Kenyan institutions and local communities which will serve as a model for future engagements in utilization of indigenous genetic resources for research and development.

#### **Outcome 4.1: A model ABS agreement between provider and user in compliance with Nagoya Protocol in place for Kenya**

***Output 4.1.1. At least 1 ABS agreement between provider (KWS and Soda lakes communities- county government), local Kenyan institutions (KIRDI, Moi University, University of Nairobi Science and Technology Park Ltd and the JKUAT Enterprise Ltd), DSMZ and the industrial partner, Verenum Corporation) resulting from research and development of microbial samples taken from the Soda lakes executed;***

The potential of some microorganisms isolated from Kenyas' Soda lakes have been utilized for commercial benefits without clear benefit sharing arrangements between the government, local communities and the user. Baseline scenario

agreements have been executed between KWS and Novozyme, ICIPE/KWS/Dupont, ICIPE/KWS/Verenium (f.k.a Diversa), JKUAT/DSMZ based on ABS which have acted as a platform for negotiations of accruing benefits. In most of these cases the Kenyan soda lakes biodiversity were instrumental as a platform for partnerships. In previous engagements, aspects of MTA in respect to specimen storage and transfers to third parties may not have been emphasized. To realize these benefits, the project partners will enter into agreements for utilization of microbial genetic resources within the protected Kenyan Soda lakes for research, development and commercialization of industrial enzymes and bio-pesticides for improved resource management and livelihoods in compliance with the Nagoya Protocol on Access and Benefit Sharing. The GEF funds will facilitate the development of this ABS agreement which will be used as a model in the country in formulation of ABS laws.

**Output 4.1.2 Prior Informed Consent (PIC), Mutually Agreed Terms (MAT) and Material Transfer Agreements (MTA) developed and operationalized in line with the Nagoya Protocol;**

The Nagoya Protocol places strong emphasis on aspects of Prior Informed Consent, Mutually Agreed Terms and Material Transfer Agreements between legal entities when undertaking bioprospecting activities. Based on the current ABS legislation which is to be reviewed, when accessing the countrys genetic resource, one has to be granted an access permit by NEMA, research clearance by NACOST (f.k.a NCST), PIC, MTA and MAT by providers in case of wildlife, by KWS and where local communities are involved, PIC is granted jointly by the communities and the competent government lead agency. For example, KWS grants PIC on all wildlife and where local communities involved like National reserves is given jointly. Currently, systems for PIC, MTA and MAT have not been streamlined within protected areas which include the soda lakes. The GEF funds will be used to support the government effort on developing PIC, MTA and MAT and systems for implementation within the project scope.

**B.3 Socioeconomic benefits to be delivered by the Project at national and local levels**

The project is in line with the country’s vision 2030 development goals for industrial transformation. The soda lakes project cuts across the three components of Vision 2030 that is Economic, Social and Political pillars. Its implementation will realize the country’s road map on industrial transformation using the soda lakes microbial biotechnology. This project addresses an all round adoption of science, technology and innovation as an implementation tool. More so, the aspect of environment, systems for enhancement of protection and conservation of the soda lakes, elements of equity and poverty alleviation through the ABS system will be realized from the project. The project addresses components of the Kenyan constitution on intellectual property and the environment. Chapter 5 part 2 Article 69 (1)-(2) of the constitution focuses on sustainable use of biodiversity and effective management of natural resources. Article 69 (1) (a) indicates that the state shall ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure equitable sharing of the accruing benefits. In addition sections c-e state:-

- (c) Protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and genetic resources of the communities;
- (d) Encourage public participation in the management, protection and conservation of the environment;
- (e) Protect genetic resource and biological diversity.

The capacity of the community and Kenyans as a whole will be enhanced through both short term and long term training, improvement of infrastructure within the soda lakes will contribute to species conservation as well as increased tourism within the region. The level of understanding microbial ecology will enhance ecosystem management of the soda lakes therefore leading to enhanced conservation. The major impact of the Project will be in the establishment of a platform for PIC, MAT, MTA and a benefit sharing plan for the country. This will ensure any accrued benefits from the genetic resources are equitably shared with the communities and also for use in conservation activities. The Project will also contribute to an enhanced collaboration between the private and the public sector leading to the transfer of technology that supports conservation and livelihood improvement in compliance with the Nagoya Protocol.

**B.4 Risks**

Risk	Level	Mitigation measures
Lack of clarity in policy framework on ABS may affect implementation of the project	Low	The government is in the process of reviewing ABS legislation in the country and also the project has factored in elements of harmonizing related incoherence.

Local communities may not perceive the connection between the project activities and conservation	Low	The project objectives will be extensively discussed with the communities at the project sites before implementation of the proposed activities through workshops.
Bioprospecting benefits take time to be realized and in some cases, it is not clear to determine community beneficiaries	Medium	Effective community structures will be established as a platform for managing and utilizing benefits arising from Bioprospecting activities within the soda lakes. Also, measures for both short term and long term benefits will be factored in the project.
The involvement of private sector not party to CBD and Nagoya Protocol may affect compliance	Medium	Nagoya Protocol advocates use of agreements, PIC, MTA and MAT which are enforceable under the relevant law, in particular, the jurisdiction administering the ABS agreement. The agreements will be drafted by competent legal experts with clarity and in line with all legal provisions.
The best organism producing a candidate compound is protected by another institution overseas	Medium	A well defined MTA and agreement that will state the accession, patentability, depositing and commercialization of candidate microbial strain and derivatives.

## B.5 Key stakeholders

The stakeholders here include resources providers and the users. This will include local Kenyan and foreign institutions and the main industrial private partner.

**Kenya Wildlife Service (KWS)** is a key government agency charged with managing wildlife resources under the Wildlife Act. Currently the Wildlife Act has been reviewed and is awaiting parliament approvals. In the new Bill issues of Bioprospecting have been emphasized. Also KWS is in charge of implementing the National Bioprospecting strategy which aims at streamlining ABS issues within the protected area systems. Thus the organization is transforming itself to take lead as the main advisor to the government in terms of wildlife conservation and management. KWS is focussing on establishing centres of excellence for Bioprospecting to act as platforms for collaboration and technology transfer between users and providers in line with government priority settings and policies. Currently KWS is the chair of the National Access permits evaluation committee under NEMA. The Wildlife Management Authority grant PIC, MTA and MAT related to utilization of wildlife genetic resources under the National ABS laws and is the primary checkpoint for the Nagoya Protocol. Some of the Soda lakes are within designated National parks and others in National reserves and recently some were designated as world heritage sites. Management of these soda lakes falls under the Wildlife Act where KWS provides a leading role.

The concept of the Soda lakes project was developed by KWS for the GEF-NPIF funds to facilitate streamlining and implementation of Nagoya Protocol in the country. KWS is the main local host to the project and will play a leading role in coordination and also during execution in partnership with UNEP. Also is the key provider of the genetic resources together with communities around the Soda lakes on behalf of the government of Kenya. KWS will provide platform for the project implementation during and after its lifespan. The Wildlife Management authority scientists will be involved in the Soda lakes research and development activities specifically in sampling and setting up wildlife bioinformatics centre.

**County Government;** Under the Kenyan constitution resources are managed at both National and county governments levels. It is critical that for sustainable management of genetic resources and equitable sharing of benefit resulting from their utilization all relevant stakeholders be involved. Some of the designated Soda lakes are co-managed between KWS and the county government. Aspects of utilization of genetic resources for research and development are being controlled by the National government with involvement of county government and local communities. Therefore there is a need to establish clear structures for PIC, MAT and MTA linking national government, county government and local communities. Already wildlife management authority has established a system linking county and National government. A stakeholder workshop has been held which brought, together representatives of local communities,

county government within the Soda lakes that discussed issues of utilization of genetic resources for research and development in terms of Nagoya protocol. Formation of Soda lakes platform has been suggested. County government will play critical role during and after the project period. They will be part of the National Bioprospecting steering committee, Soda lakes platform and also in implementation of the joint management plans and will be involved in monitoring the projects implementation.

**Local communities;** The Soda lakes are found in drier parts of the country and sustain livelihoods of many pastoral indigenous communities. Whereas many benefits are derived from the soda lakes the impact has not been realized to the local communities due to various reasons. These include; lack of recognition of the local communities in decision making on utilization of the Soda lakes genetic resources and unclear structures of benefit sharing and management at local level. Efforts have been put in place through the joint management plans which recognizes the role of local communities and also structures of benefits sharing, for example the Lake Bogoria National reserve and Lake Magadi. In these two lakes the local communities enjoy part of benefits generated from tourism. No benefits have yet been shared from the utilization of genetic resources for research and development. Community structures within the soda lakes will be established and will be part of the process in granting PIC and MAT on utilization of the underlying genetic resources. The local communities are part of the Soda lakes platform; they will actively participate in the development of joint management plans that will review their roles and benefits among others. The benefits generated from this project will be shared as per the agreed Agreement up to community level through the established structures.

**National Environment Management Authority (NEMA):** NEMA manages the ABS legislation and is charged with granting of Access permits for the Kenyan genetic resources. Currently the authority together with Partners is developing access permits guidelines under GEF funding through UNEP-GIZ. During the project submission process NEMA was consulted and upon their advice, the government through the Ministry of environment endorsed the project. NEMA will play a critical role for the success of this project during and after its lifespan through grants of access permits and benchmarking achievements against the ABS legislations and policies. This project will support NEMA and partners in contributing towards ongoing ABS legislative review and ratification of Nagoya protocol through high impact sensitization workshops.

**National Commission of Science and technology (NACOST); NACOST (f.k.a NCST)** has recently been transformed from NCST under a new legislation. This has now been split in Science commission and National innovation agency. NACOST is charged with research clearance, gives grants and advices government on all aspects of science and Technology. Together with NEMA and KWS, the NACOST will be involved in ABS regulatory framework review and also as part of the projects exit strategy where they will be requested to fund some of the identified activities. Already NACOST has supported various students undertaking Microbial research in the soda lakes through various grants. NACOST is also putting in place policies on establishment of designated depositories and has supported the establishment of JKUAT IBR microbial culture centre that will act as local depository.

**Local research institutions;** Involvement of local institutions has been recommended as key component of the ABS and Nagoya Protocol. The Jomo Kenyatta University of Agriculture and Technology have a well established programme on microbial research and development. Most of the work has focused on Soda lakes. Currently, various students have been training ranging from short courses, undergraduate and graduate programs in collaboration with DSMZ. As a result, they have a microbial germplasm collection which is held by individual scientists. The Kenyan government, through the National Council of Science and Technology is establishing a National Microbial deposit which is being hosted by the University. The critical mass of microbial experts under the culture collection centre will contribute greatly on the success of the Soda lakes project. They will be involved in sample collection screening, maintenance of the living library and linking with other partners on the project at various points. The JKUAT Enterprise Ltd is currently actively involved in development of technologies for industrial productions and commercialization of bio-pesticides. They have over time been involved in bio-pesticide registration in the region. This company will strengthen the delivery of the bio-pesticide component in the project and also share information and best practices on bio-pesticide registration and application.



***The University of Nairobi (UoN)*** has experts who have a wide experience and knowledge in the area of Biotechnological applications of enzymes, in particular, the utilization of enzymes to convert biomass materials into high value products. The University of Nairobi brings into this project in-house competence and facilities in the area of enzyme production, purification and downstream processing. Equipment available for this project include: bioreactors, pilot bio-fuel plant, preparative centrifuges, preparative high performance equipment and other analytical instruments. They will be involved in screening and optimizing talented candidate microbes and products.

***The University of Nairobi Science and Technology Park Ltd*** undertakes incubation, process development and commercialization of research from the University scientists. They have over the time built the capacity to evaluate and scale-up enzyme biotechnology processes for commercialization. They will be involved in incubation of identified priority products.

***Kenya Industrial Research Institute (KIRDI)***: KIRDI is the country's industrial research institute which advises the government on various aspects of technology development and application. They are actively involved in development of a wide range of industrial technologies among them industrial enzymes and bio-pesticides. Together with UON and Verenium they will be involved in pilot production, testing and quality control of candidate technologies generated from the project as per the agreement.

"Kirdi has a highly trained and professionally multi-disciplinary team composed of chemical engineers, biochemists, chemists, bio technologists, micro biologists and even socio economic scientists who are definitely up to the task of designing, fabrication, setting up and optimization of the pilot plant. The products that will come out from the pilot plant will be both on national and international standards in terms of quality, functionality and packaging. The area of enzyme production from microorganisms is an area that KIRDI has the capacity and the experience to undertake. Vision 2030 gives us the mandate to add value to Kenyan local raw materials including biomaterials and others". Currently, KIRDI has a company in the name of Kirdi Enterprise Services which will represent KIRDI in implementation of this project.

***Moi University and Rivatex East Africa Ltd***: Rivatex is one of the major textile companies in East Africa and is fully owned by Moi University. The University uses the facility for teaching, research, extension, fabric development and commercialization. This facility manufactures textile products made from fiber (cotton) from which yarn is made and processed into cloths.

***DSMZ*** is a member of the Leibniz Association and is involved in international organizations such as the European culture collection Organization, the World culture collection federation and Global Biodiversity Information Facility. They have over 32641 cultures ranging from microorganisms, human and animal cell lines, plant cell lines and plant viruses. It is one of the world's most comprehensive bio-resource centre as well as a state of the heart institution. Their expertise in documentation and quality management information systems for the microbial culture collection will play a crucial role in this project. They will also provide improved ex-situ preservation of the microbial culture collection. Utilization of collected soda lakes microorganisms under this project will be guided the signed agreement (MAT) between partners, the PIC and MTA.

***Verenium Corporation*** is a San Diego, California-based industrial biotechnology company that specializes in the development of high performance enzymes. It is a recognized pioneer in the development and commercialization of high-performance enzymes for use in industrial processes. Enzymes are not just the future of industry; they are transforming industries and responding to market demands today. The companies tailored enzymes are environmentally friendly, making products and processes greener and more cost-effective for industries including the global food and fuel markets. By combining discovery and laboratory evolution technologies, Verenium has successfully developed and commercialized a suite of highly differentiated enzyme products tailored to meet the specific needs of companies in various markets, including grain processing, biofuels, animal health and nutrition and other industries. The company sells enzymes developed using its unique R&D capabilities to a global market. The company harnesses the power of nature and, leveraging unique, patented technology, creates products that maximize

efficiency while environmental performance. Verenium brings into this project vast experiences on microbial sampling, screening and storage and technologies for industrial enzyme development including marketing skills. Verenium will utilize the exchanged material as per the project agreement (MAT) and MTA. The key role will be to build capacity of wildlife management in sampling, storage of Soda lakes microbial resources for monitoring purposes, together with local research institution and companies undertake research and develop products from microbial genetic resources from soda lakes and share out benefits as per the agreed agreement by all stakeholders. They will also contribute to the projects sustainability in resource mobilization and building capacities of local institutions towards microbial enzyme development and optimization through technology transfer.

#### **B.6. How cost-effectiveness is reflected in project design**

Since the CBD entered into force, bioprospecting activities have been brought under its administration. The main focus has been on the implementation of the three objectives of CBD that is sustainable use, conservation and equitable benefit sharing. Implementation of the third objective of the CBD on Benefit sharing still remains a challenge. The aspect of equitable sharing of benefits arising from the utilization of genetic resources. Implementation of the third objective of the CBD on benefit sharing still remains a challenge. The aspect of equitable benefit sharing has evolved from the CBD, the Bonn Guidelines and now the Nagoya Protocol on utilization of genetic resources through research, development and commercialization. Whereas there are huge profits realized from Bioprospecting, little is linked to conservation of biodiversity. There has been a decline on investment by private sector on Bioprospecting on indigenous genetic resources due to many factors ranging from high costs of investment in research and development and legal uncertainty in many provider and user countries. Currently, there are no clear effective ABS examples, however, the Kenya Pioneer projects between Verenium (f.k.a Diversa)/ICIPE/KWS, DuPont/ICIPE/KWS, Diversa Yellowstone National park, USA and Costa Rica have been cited as some of the successful biodiversity business partnership benefit sharing arrangement. The major advantage of this project as compared to the previous ones is that the heavy costs of research and development borne by the private sector have been taken up by the GEF NPIF funds. This acts as a stimulus in investment in biodiversity research and development that accelerates benefits and enhances partnership which promote conservation and livelihood improvement. The USA has venture capital that promotes research and development which have stimulated creativity leading to industrial transformation. Whereas previous engagements were initiated by the private sector, this engagement has been initiated by the resource provider in consultation with the users from an informed point of view. Therefore this arrangement brings on board informed stakeholders with clear focus on ABS issues. Recent discussions in international meetings and initiatives for example the IUCN ABS initiative recommends protected area systems to play critical role as ABS focal points, if biodiversity conservation benefits are to be realized. KWS has taken a lead role in this soda lakes ABS initiative whereby biodiversity conservation benefits are clearly identified and mainstreamed within protected area system.

It is anticipated that the use of natural bioresources from soda lakes will help promote cost-effective and efficient research with a long term positive effect on the development of products for the improvement of human health, crop protection, environment and biodiversity conservation. In this way, the sustainability of the processes and the development of the products arising from the bioprospecting effort will contribute to a mission of 'fostering an effective global research effort'. The aspects that will be considered in this context will include;

*Social net benefits* - Improved tourism through creation of nature trails will generate more funds that will lead to indirect job creations, technology transfer, business start-ups and others that cannot be monetized. Based on the ABS agenda on the CBD, genetic resource access and associated traditional knowledge will be harnessed in a cost effective manner.

*Capacity building*- Awareness creation to the public on Access and Benefit Sharing principles in relation to Bioprospecting activities will serve the countries best interest. The limitation posed in terms of technical capacity to implement the initiatives is addressed by the involvement of the private sector, which will oversee the implementation process.

#### **B.7 Coordination with other related initiatives**

This project build on previous ABS partnership projects within protected area system and multinational bioprospecting companies. These partnerships have been based on discovery, development and commercialization of products derived from the genetic materials collected from Kenya with capacity building of local institutions by the industrial partners,

donations of research / conservation grants and royalties provided based on products and inventions arising from the use of the materials. These projects involved the isolation of microorganisms from diverse environments including the use of culturable and non-culturable microorganisms and plant secondary metabolites. As a result, a germplasm of these microbes was generated which is currently at the International Centre of Insect Physiology and Ecology. Technology transfer was a key issue in the agreement and this was realized through offer of state of the art equipment for research, training of several undergraduate and graduate students. Different Kenyan Universities have also been engaged in research activities targeting the microbial diversity of Kenyan soda lakes in collaboration with foreign institutions in line with the CBD regulations. These projects were executed before the Nagoya Protocol and establishment of the ABS legislation in the country. Also the international institutions executed the projects on behalf of the Kenya government. The active participation of local institutions and protected area system was wanting in these pioneer ABS arrangements affecting realization of the third objective of CBD. This project has brought on board protected area management system, local communities and local institutions in partnership with international institutions and companies.

The proposed Project is also consistent with the National priorities and plans in that; the constitution of Kenya, which is the supreme law of the country, provides for sustainable exploitation, utilization, management and conservation of the environment and natural resources for the benefit of the people of Kenya (article 69-72). In addition, Kenya is a party to key international frameworks, related to ABS, such as the CBD, International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), and IPR related treaties. Kenya's strategic goals for transformation through industrialization as envisioned in vision 2030 based on innovation and knowledge economy. Vision 2030 recognises the role of science, technology and innovation (STI) in a modern economy, in which new knowledge plays a central role in wealth creation, social welfare and international competitiveness. Amongst the elements recognized as enabling the effective exploitation of knowledge are (a) an economic and institutional regime that provides incentives for the efficient use of the existing knowledge, the creation of new knowledge, and the flourishing of entrepreneurship; and (b) an effective innovation system (i.e. a network of research centres, universities, think tanks, private enterprises and community groups). The project is in line with EMCA 1999 and the subsidiary law on ABS and the just launched strategy for bioprospecting within and outside protected areas. Most of the country's biodiversity related legislations are being reviewed in line with the constitution. These include the draft Wildlife Policy and bill, and the Intellectual property legislation. The science and technology Policy 2009 recognizes the role of biodiversity and associated traditional knowledge in economic development. It recommends the exploitation of microorganisms, flora and fauna both from conservation and outside conservation areas and suggests need for the government to support these initiatives. The policy also recommends the need for information database on bioprospecting activities in the country for informed decision making including establishment of culture centres for monitoring purposes. The National Biodiversity Strategy Action Plan 2000 proposes various strategies to address policy and legislation issues on biodiversity. It highlights the need of developing the country's bioprospecting strategy which has been instituted. It also emphasizes on ex-situ conservation of biodiversity and equitable sharing of benefits derived from the use of biodiversity. The National Policy on Traditional Knowledge, Genetic Resources and Traditional Cultural Expression, 2009 proposes to protect traditional knowledge through a *sui generis* system, ensure mandatory disclosure of origin of genetic resources and traditional knowledge in intellectual property applications and develop mechanisms for certification, labelling, trademark and geographical indications authorized by the communities concerned.

## **C. GEF AGENCY INFORMATION:**

### **C.1 Confirm the co-financing amount the GEF agency brings to the project**

UNEP potential for leveraging co-financing for NPIF projects resides in its ability to secure a robust partnership around projects. At this early stage of the proposed project UNEP has with KWS mobilized partnerships with local Universities and the private sector in Kenya (JKUA, UoN, KIRDI, Rivatex East Africa Ltd. of Moi University) and managed to secure co-financing commitment of USD \$1,760,868. Through UNEP Division of Environmental Law and Conventions (UNEP DELC) it adds an initial USD \$ 100,000 of in-kind contribution from its own resources. UNEP DELC will also bring technical and legal expertise to complement efforts during the implementation of the project.

### **C.2. How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:**

The proposed NPIF project is in line with United Nations Development Assistance Framework (UNDAF) for Kenya for the period 2009-2013 which aims at contributing to the realization of National priorities, the achievement of the principles and values embedded in the Millennium Development Goals (MDGs) and vision 2030 of Kenya. This common agenda and framework state that the government of Kenya will work with all development partners towards achieving the above stated goals in the geographical regions of the project and lessons learned may be used for scaling up projects in other Districts in Kenya. UNEP through the Regional Office for Africa (UNEP ROA) assisted the formulation of the UNDAF and does support its implementation along with other UN agencies.

UNEP is extremely well equipped to implement the project, especially one dealing with Access and Benefit Sharing (ABS) and one in Kenya in particular where UNEP is headquartered. This project adds to other ABS projects that UNEP has successfully developed and is implementing currently that include the UNEP GEF “Supporting the Development and Implementation of Access and Benefit Sharing Policies in Africa (GEF ID 2820)”; UNEP GEF “Strengthening the Implementation of the Biological Diversity Act and Rules with Focus on its Access and Benefit Sharing Provisions in India (GEF ID 3801)”; UNEP GEF “LAC ABS: Strengthening the implementation of ABS regimes in Latin America and the Caribbean (GEF ID 3855)”, UNEP GEF “Capacity Building for the early entry into force of the Protocol on Access and Benefit Sharing (GEF ID 4415)”; UNEP GEF “UNEP GEF “Access to and Benefit Sharing and protection of traditional knowledge to promote biodiversity conservation and sustainable use in Guatemala (GEF ID 4618)”; and for the GEF Nagoya Protocol Implementation Fund (NPIF) the UNEP GEF “Global support for Early ratification of the Nagoya Protocol on Access and Benefit Sharing (GEF ID 5172)”. The latter is being executed by UNEP DELC and is assisting thirty countries to ratify the Nagoya Protocol.

UNEP has the mandate of advancing global environmental protection, particularly with its current Medium Term Strategy and its strategic framework for 2012-2013 for Subprogramme 4 (Environmental Governance). Subprogramme 4 focuses on ensuring that environmental governance at country level is strengthened to address agreed environmental priorities. The project also benefits from UNEP’s comparative advantage among the GEF implementing agencies in using scientific knowledge to inform and underpin policy and decision-making related to the global environment. This is highlighted in table below.

The project is consistent with the following areas of UNEP’s mandate in the GEF (as identified in <b>areas of UNEP comparative advantage in the GEF (all Focal Areas)</b> )		UNEP Thematic Priority Areas					
		Climate Change	Disasters & conflicts	Ecosystems management	Environmental governance	Harmful substances & hazardous wastes	Resource efficiency
1. Sound science for national, regional and global decision-makers	Early warning and emerging issues				X		
	Science to Policy linkages				XXX		
	Environmental monitoring and assessment				X		
	Norms, standards, and guidelines				XXX		
	Enabling Activities for MEAs and synergies				XX		
2. Cooperation, coordination and partnerships	Trans-boundary cooperation						
	Regional, or						

(regional or international)	South-South cooperation						
	Global transformative actions						
3. Technical assistance and capacity building at country level (contribution to Bali Strategic Plan)	Technology assessment, demonstration, and innovation				XXX		

### **PART III: INSTITUTIONAL COORDINATION AND SUPPORT**

#### **A. INSTITUTIONAL ARRANGEMENT:**

UNEP Division of Environmental Policy Implementation (UNEP DEPI) is the Implementing Agency (IA) for this project. As such, UNEP DEPI will be responsible for coordinating activities, monitoring the implementation of UNEP's standard M&E procedures, and transmitting financial and progress reports to the GEF. The project is being internally executed with DELC as the Executing Agency. It will therefore be bound by the guidelines for internally executed projects within UNEP. While UNEP-DEPI will maintain its role as implementing agency with oversight functions, UNEP-DELC will assume the overall executing functions in the project. As executing agency, UNEP-DELC will work with Kenya Wildlife Service (KWS), the lead partner in this project and be responsible for managing project implementation on a day-to-day basis. The execution arrangements for implementing this project will be further detailed out in a contract between UNEP DELC and KWS at start of project implementation.

#### **B. PROJECT IMPLEMENTATION ARRANGEMENT:**

UNEP DEPI will be responsible for project implementation. It will monitor the project in accordance with the agreed budget and outputs and disburse funds to project partners through UNEP DELC to facilitate implementation. It will communicate to UNEP DELC the GEF requirements for project reports and evaluations. As the executing agency UNEP DELC and KWS will be responsible for providing sufficient staff resources to perform administrative and programmatic duties, mobilize co-financing, and overseeing project M&E.

### **PART IV: EXPLAIN THE ALIGNMENT OF PROJECT DESIGN WITH THE ORIGINAL PIF**

N/A


### **PART V: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

- A. **RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):** (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [OPF endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Ali D. Mohamed, CBS	Permanent Secretary	Ministry of Environment & Mineral Resources	27 August, 2012

**B. GEF AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

<b>Agency Coordinator, Agency Name</b>	<b>Signature</b>	<b>Date (Month, day, year)</b>	<b>Project Contact Person</b>	<b>Telephone</b>	<b>Email Address</b>
Maryam-Niamir-Fuller, Director, GEF Coordination Office		28 Oct 2013	Mohamed Sessay	+254 20 762 4294	<a href="mailto:mohamed.sessay@unep.org">mohamed.sessay@unep.org</a>

## ANNEX A: PROJECT RESULTS FRAMEWORK

	Indicator	Targets Mid-point	Target End of projects	Source of verification	Assumptions
<b>Component 1: To enhanced legal and regulatory framework on ABS in Kenya</b>					
<b>Outcome 1.1:</b> Policy, legal and regulatory frameworks on ABS upgraded in compliance with the provisions of the Nagoya Protocol;	Legal clarity on ABS resulting in increased bioprospecting activities on the Kenyan genetic resources	Review of ABS legislations fully underway.  PIC, MAT and MAT under construction  Development of joint management plans that integrate benefit sharing schemes	Reviewed ABS laws,  PIC, MTA and MAT;  Joint management plans that integrate sustainable benefit sharing schemes for selected soda lakes;	Minutes of meeting;  Copies of reviewed MTA and access permits;  Management plans;	The government will ratify the Nagoya protocol within the Projects period;
<b>Outcome 1.2:</b> ABS institutionalized in protected areas as a tool for enhanced conservation and livelihood improvement ;	Enhanced benefits and conservation of protected area systems resulting from ABS based projects;	Clear structures for bioprospecting and benefit sharing for protected area systems and local communities linking between users and provider both at National and county level in process.	Protected system to be focal points for ABS in the country;  Increased Bio-prospecting activities within protected area systems;  Trails around two soda lakes;  Benefits from signed ABS agreements in support of conservation in place	Workshop reports;  Procurement documents;  Established facilities within the soda lakes;  Signed PIC, MTA, MAT  Minutes of meetings  Monitoring tool kit for Bioprospecting activities within the soda lakes;	The government is committed to science and technology innovations and will be sustained throughout the Project period under vision 2030;

**Component 2; Systematic discovery of natural products for bio-pesticides and industrial enzymes**

<p><b>Outcome 2.1:</b> At least 1 potential microbial isolate characterized and deposited at the Culture Collection Center at Jomo Kenyatta University of Agriculture and Technology (JKUAT), the German Collection of Microorganisms and Cell Cultures (Deutsche Sammlung von Mikroorganismen und Zellkulturen – DSMZ) and Verenium Corporation;</p>	<p>Number of potential microorganisms isolated and screened;</p>	<p>Two microorganisms producing bioactive metabolites and enzymes identified</p> <p>Culture collection centre under construction at JKUA</p>	<p>Four microorganisms producing bioactive metabolites and enzymes;</p> <p>Culture collection centre at JKUAT in place;</p>	<p>Laboratory reports;</p> <p>Functional culture collection centre at JKUAT;</p>	<p>A number of potential microorganisms will be isolated;</p> <p>Funds will be available;</p> <p>Isolated potential microorganisms will remain viable;</p>
<p><b>Outcome 2.2:</b> At least 1 enzyme product developed for agro-processing, starch and fuel, textile, food and beverage industries by the participating Kenyan institutions and the private companies (KIRDI, University of Nairobi Science</p>	<p>Number of microorganisms screened for enzyme production;</p> <p>Number of bioactive enzymes characterized;</p>	<p>Pilot production and up scaling of at least potential Microbial candidates and enzyme production underway</p>	<p>One enzyme product;</p>	<p>Laboratory reports;</p> <p>Number of patent applications;</p>	<p>One bioactive enzyme will have potential for industrial application;</p>



and Technology Park, Rivatex East Africa, and the JKUAT Enterprise Ltd )and Verenium Corporation as the main industrial partner;					
<b>Outcome 2.3:</b> At least 1 biopesticide for enhanced seed and seedling treatment developed by the participating Kenyan institutions and the private companies (KIRDI, University of Nairobi Science and Technology Park and the JKUAT Enterprise Ltd);	Number of microorganisms screened for secondary metabolite production;  Number of bioactive compounds characterized;	Two microbial bio-pesticides under pilot production by JKUATES and KIRDI enterprises. Two bio- pesticide formulations based on isolated compounds under trials and up-scaling.	One pure compound;  One microorganism with potential industrial application;	Laboratory reports;  Number of patents;  Bio pesticide products	One bioactive compound will have potential for industrial application;  Isolated microorganism will have comparative commercial potential;
<b>Outcome 2.4:</b> A living library of Kenyan Soda lakes microorganisms established at JKUAT;	Number of microorganisms isolated;  Number of microorganisms identified and deposited at JKUAT culture collection centre;	Personnel for the living library identified and capacities build by DSMZ. Infrastructure for the living library at JKUAT improved and equipped.	A database of Kenya's soda lakes microorganisms within JKUAT culture collection;	Laboratory reports;  Database;  Number of people trained;  PIC, MAT, MTA signed;  Training reports;	Several microorganisms with potential industrial applications will be isolated;  Funds will be available to support a microbial culture collection at JKUAT;

**Component 3: Technology transfer between resource provider and user operationalized**

<p><b>Outcome 3.1:</b> Technology transferred (including equipment, know-how and training) from DSMZ and Verenium Corporation to local research institutions and protected area systems management;</p>	<p>Number of technologies transferred;</p>	<p>Negotiations advanced or at least underway on transfer of a technology</p>	<p>At least one industrial technology transferred to local institutions;</p>	<p>Agreements; Minutes of meetings;</p>	<p>The private partners will transfer appropriate technologies;</p>
<p><b>Outcome 3.2:</b> An effective bioinformatics system in Kenya at KWS for Soda lakes microbial discovery to act as a system for monitoring and evaluation established;</p>	<p>A functional bioinformatics for protected area system in place;</p>	<p>Outlines of a bioinformatics system for bio-prospecting in protected agreed</p>	<p>A system of monitoring accessed material from protected area for Bioprospecting;</p>	<p>Reports;  Established bioinformatics laboratory in KWS;</p>	<p>Funds will be available;  ABS will be mainstreamed within protected area system;</p>
<p><b>Component 4: ABS agreements developed to build the capacity of the Kenyan authorities to engage with users of genetic resources</b></p>					
<p><b>Outcome 4.1</b> ABS agreements developed to build the capacity of the Kenyan authorities to engage with users of genetic resources;</p>	<p>Equitable benefit sharing on use of indigenous genetic resources arising from effective partnerships between users and providers;</p>	<p>Partnership agreements in place and framework for benefit sharing being actively negotiated</p>	<p>Collaborative framework between the provider and user of soda lakes genetic resources in place;</p>	<p>Agreements; PIC; Minutes , letters; Reports;</p>	<p>The parties will faithfully work together to implement the provisions of the agreement and that there will be no external interference to the partnership.</p>

**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

None received

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS**

A. EXPLAIN IF THE PPG OBJECTIVE HAS BEEN ACHIEVED THROUGH THE PPG ACTIVITIES UNDERTAKEN.

N/A

B. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:

N/A

C. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE

TABLE BELOW:

N/A

\* Any uncommitted amounts should be returned to the GEF Trust Fund. This is not a physical transfer of money, but achieved through reporting and netting out from disbursement request to Trustee. Please indicate expected date of refund transaction to Trustee.

**ANNEX E: CONSULTANTS TO BE HIRED FOR THE PROJECT USING GEF/LDCF/SCCF/NPIF RESOURCES**

<b>Position titles</b>	<b>\$/person week</b>	<b>Estimated person weeks</b>	<b>Tasks to be performed</b>
<b>For project management</b>			
<i>International</i>			
<b>For technical assistance</b>			
<i>International</i>			
Specialist in Bioinformatics systems	2,700		To develop and set up a bioinformatics systems and infrastructure
Specialist in ABS agreements and negotiations	2,700	10.0	<ul style="list-style-type: none"> <li>• Review and develop ABS agreement in line with the Nagoya and National laws for the partners in the project;</li> <li>• Build the capacity of resource providers on ABS negotiation skills.</li> </ul>
<i>National</i>			
ABS capacity building	2,500	3.0	<ul style="list-style-type: none"> <li>• Build the capacity of the project partners to understand and implement PIC, MAT and MTA</li> <li>• Develop Project ISO procedures and manuals</li> </ul>

**ANNEX F1: GEF BUDGET**

SEE ATTACHED FILE

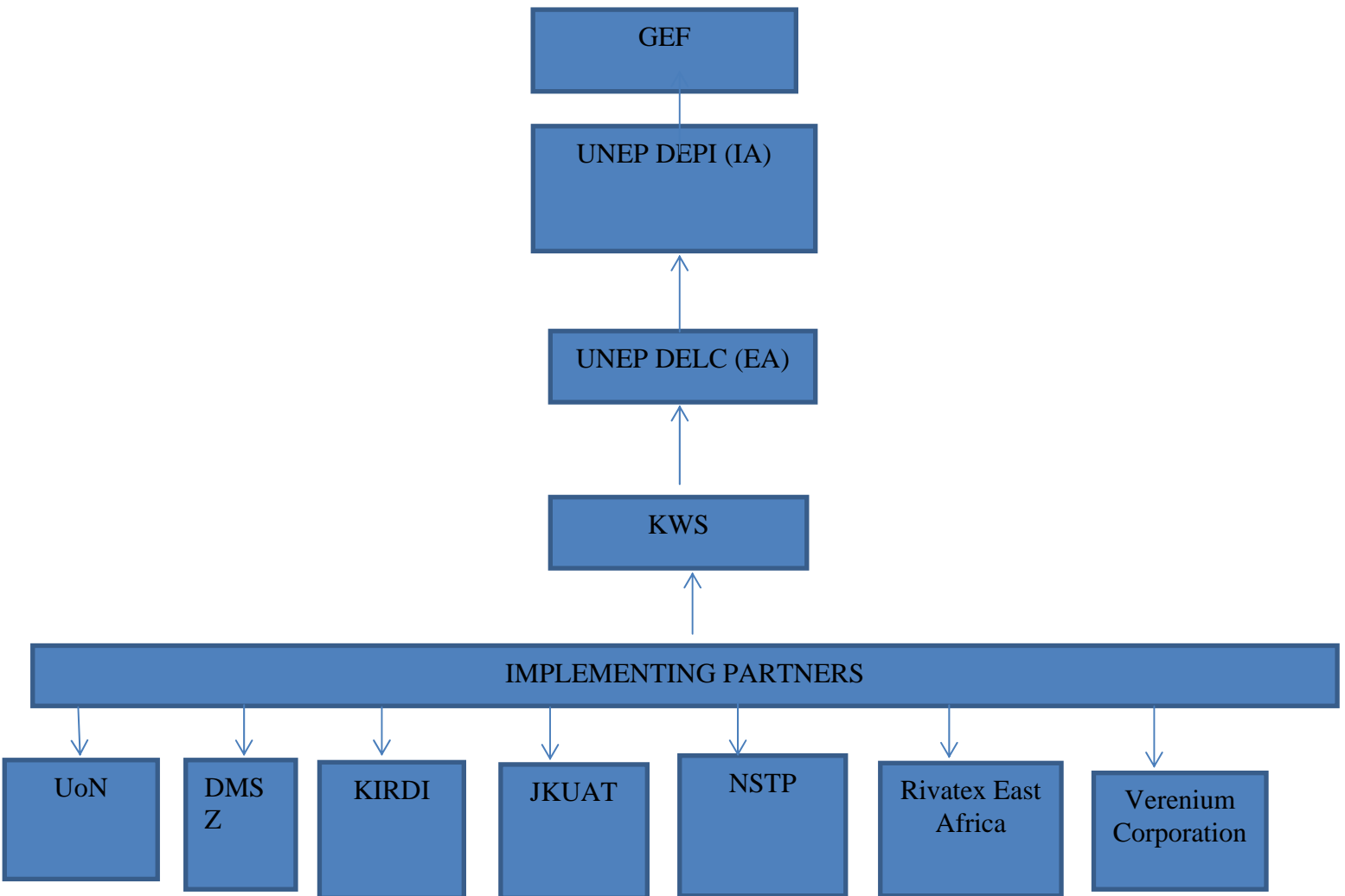
**ANNEX F2: CO-FINANCE BUDGET**

**SEE ATTACHED FILE**

## ANNEX G: Annex G: Monitoring and Evaluation Budget and Work plan

Type of M&E activity	Responsible Parties	Budget from GEF	Budget co-finance	Time Frame
Inception Meeting	UNEP-DELC/KWS & UNEP DEPI Task Manager	2,000	5,000	Within 2 months of project start-up
Inception Report	UNEP- DELC/KWS and UNEP DEPI Task Manager	0	500	1 month after project inception meeting
Measurement of project indicators (outcome, progress and performance indicators, GEF tracking tools) at national and global level	UNEP- DELC/KWS and UNEP DEPI Task Manager	10,000	15,000	Outcome indicators: start, mid and end of project Progress/perform. Indicators: annually
Semi-annual Progress/ Operational Reports to UNEP	UNEP-DELC/KWS with input from partners to UNEP DEPI Task Manager	0	500	Within 1 month of the end of reporting period i.e. on or before 31 January and 31 July
Project Steering Committee meetings and National Steering Committee meetings	UNEP DELC/KWS, Collaborating Partners; UNEP DEPI Task Manager	3,000	5,000	Once a year minimum
Reports of PSC meetings	UNEP-DELC/KWS to UNEP DEPI Task Manager	500	500	Annually
PIR	UNEP-DELC/ KWS to UNEP DEPI Task Manager	0	500	Annually, part of reporting routine
Monitoring visits to field sites	UNEP DELC/KWS and UNEP DEPI	10,000		As appropriate
Mid Term Review/Evaluation	UNEP DEPI Task Manager/UNEP EOU	20,000	10,000	At mid-point of project implementation
Terminal Evaluation	UNEP EOU/UNEP DEPI Task Manager	30,000	20,000	Within 6 months of end of project implementation
Audit	UNEP DELC/KWS	4,400	6,000	Annually
Project Final Report	UUNEP-DEPI/KWS, final clearance and processing by UUNEP DEPI Task Manager	500	500	Within 2 months of the project completion date
Co-financing report	UNEP DELC/KWS	0	500	Within 1 month of the PIR reporting period, i.e. on or before 31 July
Publication of Lessons Learnt and other project documents	UNEP DEPI Task Manager in collaboration with DELC/KWS and project partners	5,000	5,000	Annually, part of Semi-annual reports & Project Final Report
<b>Total M&amp;E Plan Budget</b>		<b>85,400</b>	<b>69,000</b>	

## ANNEX H: PROJECT IMPLEMENTATION ARRANGEMENTS



GEF: Global Environment Facility

UNEP: United Nations Environment Programme

DEPI: Division of Environmental Policy Implementation

DELC: Division of Environmental Law and Conventions

IA: Implementing Agency

EA: Executing Agency

KWS: Kenya Wildlife Service

UoN: University of Nairobi

DMSZ: Deutsche Sammlung von Mikroorganismen und Zellkulturen

KIRDI: Kenya Industrial Research and Development Institute

JKUAT: Jomo Kenyatta University of Agriculture and Technology

NSTP: Nairobi Science and Technology Park

## ANNEX I - KEY DELIVERABLES AND BENCHMARKS

Component/Outcome/Outputs	Activities	Deliverables	Benchmarks
<p><b>1.</b> To enhance legal and regulatory framework on ABS in Kenya</p>	<p>1.1.1 Review of existing legislation that govern conservation and sustainable use of genetic resources in light of the implementation of the case study of this project;</p>	<p>Existing legislations reviewed and harmonized for effective bioprospecting within the soda lakes;</p>	<p>Appropriate and effective legislations for bioprospecting within the soda lakes;</p>
	<p>1.1.2 Undertake consultative process through workshops between the county, National government and policy makers on reviewed ABS legislation in light of this project to facilitate ratification and implementation of the Nagoya Protocol;</p>	<p>Key stakeholders, policy makers, members of parliament sensitized on the need to fast track ratification of Nagoya Protocol;</p>	<p>Ratification and implementation of the Nagoya Protocol;</p>
	<p>1.1.3 Identify and map out soda lakes areas in the country, select two priority areas and through stake holder process develop management plans which include aspects of benefit sharing;</p>	<p>Management plans in selected soda lakes inclusive of local communities and aspects of benefit sharing developed;</p>	<p>Appropriate system for effective resource management and equitable benefit sharing among stake holders developed;</p>
	<p>1.2.1 Identify key stake holders and establish a National bioprospecting steering committee with clear terms of reference;</p>	<p>National oversight committee comprised of key stakeholders including local communities established to promote bioprospecting activities within protected area system;</p>	<p>ABS mainstreamed within protected and adjacent local community areas;</p>
	<p>1.2.2 Together with the national bioprospecting steering committee through a stake holder consultative process develop and launch a bioprospecting tool kit for monitoring impact of bioprospecting projects on conservation and community livelihoods;</p>	<p>Toolkit for measuring impacts of bioprospecting in the country developed;</p>	<p>A system of monitoring and evaluating bioprospecting and identified check points between provider and user as per Nagoya Protocol established;</p>



	1.2.3 Develop outreach material and disseminate to protected area management through education awareness;	Protected area systems and local communities sensitized on ABS requirements and operations;	Capacities of protected area system and local communities enhanced which promote best bioprospecting practices and good conducts in the country;
	1.2.4 Map out, procure and construct infrastructure facilities within the soda lakes to enhance research and tourism (e.g Nature trail in Lakes Bogoria, Elementaita and simbi Nyaima) for KWS and adjacent communities;	Facilities for research and nature trails to promote conservation and tourism within the selected soda lakes established;	High quality of customer service realized within the selected soda lakes;
2. Systematic discovery of natural products for bio-pesticides and industrial enzymes	2.1.1 Undertake field sampling from the soda lakes at different seasons, isolation of microorganisms and screening of the microbes for cellulase, protease and Phytase activities for agro-processing, starch and fuel, textile, food and beverage and protein hydrolysis and deposit pure strains in culture collection centers at JKUAT, DSMZ and Verenium Corporation;	A bank of soda lakes microorganisms with known potential application generated;	An effective system for bioprospecting for microorganisms from the soda lakes with industrial application in place;
	2.1.2 Select, characterize and deposit in the culture collection centres in JKUAT and DSMZ potential isolates producing bioactive secondary metabolites as biopesticides for seed and seedling treatment;	Industrial microbes from the soda lakes identified and deposited in designated culture collection centres in line with Nagoya Protocol;	Potential industrial microbes from the country held in approved <i>ex situ</i> collections for further research and development as per Nagoya Protocol;

<p>2.1.3 Undertake stock of previously collected microbial strains from the soda lakes held in culture collections at JKUAT and other partner institutions and screened the isolates for cellulose degradation and enzymes for detergent and cotton processing ;</p>	<p>A database of previously isolated microorganisms from the soda lakes established showing the players, source and storage;</p>	<p>The state and potential of previously isolated soda lakes microorganisms held in various culture collections established;</p>
<p>2.2.1 Undertake fermentation optimization studies of identified candidates for large scale production of cellulases, proteases and phytases for industrial production;</p>	<p>Fermentation techniques for priority microorganisms with industrial potential standardized;</p>	<p>Bio-processing technologies for the soda lakes microorganisms with industrial applications established;</p>
<p>2.2.2 Undertake formulation and evaluation of the produced enzymes for application in starch and fuel, textile, food and beaverage industries together with the private companies (KIRDI, Rivatex, University of Nairobi Science and Technology Park, the JKUAT Enterprise Ltd and Verenium Corporation);</p>	<p>Enzymes derived from soda lakes microorganisms piloted for industrial production;</p>	<p>Bio-processing technologies for the soda lakes microorganisms with industrial applications established;</p>
<p>2.3.1 Optimize fermentation conditions for large scale production of biopesticides for industrial production;</p>	<p>Fermentation techniques for priority microorganisms of biopesticide industrial potential standardized;</p>	<p>Bio-processing technologies for the soda lakes microorganisms with industrial applications established;</p>
<p>2.3.2 Formulate and evaluate produced biopesticides for application in the seed and horticulture industry together with the private companies (University of Nairobi Science and Technology Park, the JKUAT Enterprise Ltd and KIRDI);</p>	<p>Biopesticides derived from soda lakes microorganisms piloted for industrial production;</p>	<p>Bio-processing technologies for the soda lakes microorganisms with industrial biopesticide applications established;</p>

	2.4.1 Upgrade the Culture Collection Center at Jomo Kenyatta University of Agriculture and Technology (JKUAT) to a national culture collection to support discovery of potential Soda Lakes microbial products;	A functional microbial culture collection centre established at JKUAT;	A central microbial culture collection centre established in the country to serve as an <i>ex-situ</i> depository in line with Nagoya Protocol and national laws;
3. Technology Transfer between resource provider and user operationalized	3.1.1 Undertake an economic evaluation of the developed bioprocess technologies for efficient secondary metabolite production from the soda lake microorganisms to establish market potential;	Valuation of generated Intellectual Property for the market place;	Generated Intellectual Property protected and commercialized through technology transfer agreements;
	3.1.2 Train personnel and improve culture collection facilities at JKUAT by DSMZ;	Operations at the culture collection centre at JKUAT enhanced;	A fully functional national microbial culture collection centre;
	3.1.3 Assess Intellectual Property Rights (IPR) generated from the project and together with partners seek IPR protection where possible with Kenya Industrial Property Institute and Patent Corporation Treaty;	Generated IP protected with relevant IP offices;	IP jointly owned between the stakeholders as defined in the project ABS agreement based on Mutually agreed Terms;
	3.1.4 Evaluate and license the developed technologies through appropriate agreements in compliance with the Nagoya Protocol;	Developed technologies commercialized through technology transfer agreements;	Various types of benefits ranging from up-fronts, milestones and royalties including non monetary realized from technology licenses; Enhanced conservation and livelihood as per bioprospecting benefits;
	3.2.1 Identify, install and train personell on appropriate software system for monitoring biological specimen collection and movement from Kenya;	An efficient monitoring and evaluation system on accessed biological resources established;	An improved monitoring of utilization (research and development) of biological resources and equitable share of resultant benefits for enhanced conservation and livelihood;

	3.2.2 Map out, procure, construct and equip a bioinformatics centre at KWS;	Bioinformatic facility established and equipped for improved bioprospecting activities within protected area systems in the country;	Systematic bioprospecting within the country promoted;
4. ABS agreements developed to build the capacity of the Kenyan authorities to engage with users of genetic resources	4.1.1. Through legal consultance, develop by way of consultation an ABS agreement between provider (KWS and Soda lakes communities-county government), local Kenyan institutions (KIRDI, Moi University, University of Nairobi Science and Technology Park Ltd and the JKUAT Enterprise Ltd), DSMZ and the industrial partner, Verenium Corporation) in line with Nagoya Protocol on Mutually Agreed Terms;	A framework for effective implementation of the soda lakes ABS project developed among partners in line with Nagoya Protocol;	An ABS agreement developed to guide bioprospecting activities within the countries soda lakes established;
	4.1.2 Develop key elements of ABS i.e Prior Informed Consent (PIC), Mutually Agreed Terms (MAT) and Material Transfer Agreement (MTA) through stake holder consultation and operationalize within the project.	Guidelines for PIC, MAT and MTA developed to guide bioprospecting activities within the soda lakes;	Bioprospecting activities guided by the standard PIC, MAT and MTA.

## **ANNEX K: GEF Operational Focal Point endorsement letter**

**See attached.**

## **ANNEX L: Co-financing commitment letters from project partners**

**See attached.**

## **ANNEX N: ACRONYMS AND ABBREVIATIONS**

ABS	Access and Benefit Sharing
CBD	Conservation of Biological Diversity
CITES	Commission for International Trade in Endangered Species
DAAD	Deutscher Akademischer Austauschdienst Dienst
DSMZ	Deutsche Sammlung Mikroorganismen und Zellkulturen
EARS	East Africa Rift Valley System
EMCA	Environment Management & Coordination Act
GBDI	Global Biosciences Development Institute
GEF	Global Environment Facility
IA	Implementing Agency
IBR	Institute of Biotechnology Research
ITPGFA	International Treaty on Plant Genetic Food & Agriculture
ICIPE	International Centre for Insect and Plant Entomology
IPR	Intellectual Property Rights
IOCD	International Org. for Chemical Sciences & Development
IUCN	International Union for Conservation of Nature
JKUAT	Jomo Kenyatta University of Agriculture & Technology
KWS	Kenya Wildlife Service
KIRDI	Kenya Industrial Research & Development Institute
MAT	Mutually Agreed Terms
MDG	Millennium Development Goals
MTA	Material Transfer Agreement
M&E	Monitoring & Evaluation
NESC	National Economic and Social Council
NCST	National Council for Science & Technology
NACOST	National Council for Science & Technology
NEMA	National Environment Management Authority
NPIF	Nagoya Protocol Implementation Fund
OUV	Outstanding Universal Value
PIC	Prior Informed Consent
PC	Project Coordinator
PSC	Project Steering Committee
RAMSAR	International Convention on Wetlands
STI	Science, Technology & Innovation
TC	Technical Committee
UN	United Nations
UNEP	United Nations Environment Programme
UNEP DEPI	UNEP Division of Environmental Policy Implementation
UNEP DELC	UNEP Division of Laws and Conventions
UNEP WCMC	UNEP World Conservation Monitoring Centre
UNDAF	United Nations Development Assistance Framework
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
USA	United States of America

USAID  
UK  
UoN

United States Agency for International Development  
United Kingdom  
University of Nairobi

## ANNEX O: Standard Terminal Evaluation TOR

### TERMS OF REFERENCE

#### Terminal Evaluation of the Project “Project Title (Project acronym)”

## I. PROJECT BACKGROUND AND OVERVIEW

### A. Project General Information<sup>1</sup>

Table 1. Project summary

GEF project ID:		IMIS number:	
Focal Area(s):		GEF OP #:	
GEF Strategic Priority/Objective:		GEF approval date:	
Approval date:		First Disbursement:	
Actual start date:		Planned duration:	
Intended completion date:		Actual or Expected completion date:	
Project Type:		GEF Allocation:	
PDF GEF cost:		PDF co-financing:	
Expected MSP/FSP Co-financing:		Total Cost:	
Mid-term review/eval. (planned date):		Terminal Evaluation (actual date):	
Mid-term review/eval. (actual date):		No. of revisions:	
Date of last Steering Committee meeting:		Date of last Revision*:	
Disbursement as of 30 June 2010 (UNEP):		Disbursement as of 30 June 2010 (UNDP):	
Total co-financing realized as of 30 June 2010:		Leveraged financing:	

<sup>1</sup> Source: UNEP GEF Project Implementation Report (PIR) Fiscal Year 20XX

## *B. Project Rationale*

1. What are the problems the project intends to do something about and what is their context, what has already been done about them, what needs to be done to further resolve them...

## *C. Project objectives and components*

2. The project's overall development goal is .... Its main objective is ... The project has ... components, each with its own component objective as presented in table 2.

Table 2. Project components and component objectives

<b>Components</b>	<b>Component objectives</b>
<u>Component I</u> Name of component	
<u>Component II</u>	
<u>Component III</u>	
<u>Component IV</u>	
...	

3. The planned outputs under each component, as per the Logical Framework Matrix are presented in Annex 1 of the TORs. Component I of the project seeks to [describe in one paragraph].

4. Components II [describe in one paragraph]...

5. ...

## *D. Executing Arrangements*

6. ...

## *E. Project Cost and Financing*

7. Table 3 presents a summary of expected financing sources for the project as presented in the Project Document. The GEF provides US\$... of external financing to the project. This puts the project in the Medium-Size/Full-size Project category. The project is expected to mobilize another US\$... million in co-financing, mostly from Governments (US\$...), ..., and .... Table 3 also summarizes expected costs per component and financing sources.

8. The most recent Project Implementation Review (PIR) for fiscal year 20xx reports that by 30 June 20xx the project had effectively disbursed US\$... of the GEF grant to UNEP – close to ... percent. By then, the project had mobilized over US\$... in co-financing.

Table 3. Estimated project costs per component and financing source

<b>Component</b>	<b>Co-financing Governments</b>	<b>Co-financing others</b>	<b>GEF</b>	<b>TOTAL</b>	<b>%</b>
<b>Comp I:</b> ...					
<b>Comp II:</b> ...					
<b>Comp III:</b> ...					
<b>Comp IV:</b> ...					
<b>Comp V:</b> ...					

<b>PDF (B)</b>					
<b>UNIDO Execution Fee</b>					
<b>Total Project Financing</b>					100

Source: Project Document for CEO Approval – date

### ***F. Project Implementation Issues***

9. Logframe revisions? Partners bailing out? Extensions? Management issues?
  
10. A Mid-term Evaluation of the project was conducted by the UNEP Evaluation and Oversight Unit in [date]. The main issues identified at that time were...



## II. TERMS OF REFERENCE FOR THE EVALUATION

### A. Objective and Scope of the Evaluation

11. In line with the UNEP Evaluation Policy<sup>2</sup>, the UNEP Evaluation Manual<sup>3</sup> and the Guidelines for GEF Agencies in Conducting Terminal Evaluations<sup>4</sup>, the terminal evaluation of the Project “Project Title (Acronym)” is undertaken at the end of the project to assess project performance (in terms of relevance, effectiveness and efficiency), and determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability. The evaluation has two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNEP, [other key partners] the GEF and their partners. Therefore, the evaluation will identify lessons of operational relevance for future project formulation and implementation. It will focus on the following sets of **key questions**, based on the project’s intended outcomes, which may be expanded by the consultants as deemed appropriate:

- (a) [Reformulate the project objectives into a question e.g. How successful was the project in supporting GCLME countries to establish an ecosystem-wide fisheries monitoring, assessment, and management system]
- (b) ...

### B. Overall Approach and Methods

12. The terminal evaluation of the Project “Project Title (Acronym)” will be conducted by an independent consultant under the overall responsibility and management of the UNEP Evaluation Office (Nairobi), in consultation with the UNEP GEF Coordination Office (Nairobi).

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

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

- (a) A **desk review** of project documents<sup>5</sup> including, but not limited to:
  - Relevant background documentation, inter alia UNEP and GEF policies, strategies and programmes pertaining to international/transboundary waters; [add any other relevant background docs];
  - Project design documents; Annual Work Plans and Budgets or equivalent, revisions to the logical framework and project financing;
  - Project reports such as progress and financial reports from countries to the EA and from the EA to UNEP; Steering Committee meeting minutes; annual Project Implementation Reviews and relevant correspondence;
  - The Mid-term Evaluation report;
  - Documentation related to project outputs such as: [add any relevant documented project outputs]

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<sup>2</sup> <http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationPolicy/tabid/3050/language/en-US/Default.aspx>

<sup>3</sup> <http://www.unep.org/eou/StandardsPolicyandPractices/UNEPEvaluationManual/tabid/2314/language/en-US/Default.aspx>

<sup>4</sup> [http://www.thegef.org/gef/sites/thegef.org/files/documents/TE\\_guidelines7-31.pdf](http://www.thegef.org/gef/sites/thegef.org/files/documents/TE_guidelines7-31.pdf)

<sup>5</sup> Documents to be provided by the UNEP and UNDP are listed in Annex 7.

(b) **Interviews**<sup>6</sup> with:

- Project management and execution support;
- UNEP Task Manager and Fund Management Officer (Nairobi);
- Country lead execution partners and other relevant partners;
- Relevant staff of GEF Secretariat;
- Representatives of other multilateral agencies (e.g. IMO, FAO) and other relevant organisations.

(c) **Country visits.** The evaluation team will visit ....

### **C. Key Evaluation principles**

15. Evaluation findings and judgements should be based on **sound evidence and analysis**, clearly documented in the evaluation report. Information will be triangulated (i.e. verified from different sources) to the extent possible, and when verification was not possible, the single source will be mentioned<sup>7</sup>. Analysis leading to evaluative judgements should always be clearly spelled out.

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

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

18. In attempting to attribute any outcomes and impacts to the project, the evaluators should consider the difference between **what has happened with** and **what would have happened without** the project. This implies that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. This also means that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project. Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluators, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

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

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<sup>6</sup> Face-to-face or through any other appropriate means of communication

<sup>7</sup> Individuals should not be mentioned by name if anonymity needs to be preserved.

## D. Evaluation criteria

### 1. Attainment of Objectives and Planned Results

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

- (a) *Achievement of Outputs and Activities*: Assess, for each component, the project's success in producing the programmed outputs as presented in Table A1.1 (Annex 1), both in quantity and quality, as well as their usefulness and timeliness. Briefly explain the degree of success of the project in achieving its different outputs, cross-referencing as needed to more detailed explanations provided under Section 3 (which covers the processes affecting attainment of project objectives). The achievements under the regional and national demonstration projects will receive particular attention.
- (b) *Relevance*: Assess, in retrospect, whether the project's objectives and implementation strategies were consistent with: i) Sub-regional environmental issues and needs; ii) the UNEP mandate and policies at the time of design and implementation; and iii) the relevant GEF focal areas, strategic priorities and operational programme(s).
- (c) *Effectiveness*: Appreciate to what extent the project has achieved its main objective **to ...** and its component objectives as presented in Table 2 above. To measure achievement, use as much as appropriate the indicators for achievement proposed in the Logical Framework Matrix (Logframe) of the project, adding other relevant indicators as appropriate. Briefly explain what factors affected the project's success in achieving its objectives, cross-referencing as needed to more detailed explanations provided under Section 3.
- (d) *Efficiency*: Assess the cost-effectiveness and timeliness of project execution. Describe any cost- or time-saving measures put in place in attempting to bring the project to a successful conclusion within its programmed budget and (extended) time. Analyse how delays, if any, have affected project execution, costs and effectiveness. Wherever possible, compare the cost and time over results ratios of the project with that of other similar projects. Give special attention to efforts by the project teams to make use of / build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. to increase project efficiency.
- (e) *Review of Outcomes to Impacts (ROtI)*: Reconstruct the logical pathways from project outputs over achieved objectives towards impacts, taking into account performance and impact drivers, assumptions and the roles and capacities of key actors and stakeholders, using the methodology presented in the GEF Evaluation Office's ROtI Practitioner's Handbook<sup>8</sup> (summarized in Annex 8 of the TORs). Appreciate to what extent the project has to date contributed, and is likely in the future to further contribute to changes in stakeholder behaviour as regards: i) [deduce from the component objectives], ii)... and the likelihood of those leading to changes in the natural resource base and benefits derived from the environment: a) [deduce from project main objective and overall development objective]; b)....

### 2. Sustainability and catalytic role

21. **Sustainability** is understood as the probability of continued long-term project-derived results and impacts after the external project funding and assistance ends. The evaluation will identify and assess the key conditions or factors that are likely to undermine or contribute to the persistence of benefits. Some of these factors might be direct results of the project while others will include contextual circumstances or developments that are not under control of the project but that may condition sustainability of benefits. The

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<sup>8</sup> [http://www.thegef.org/gef/sites/thegef.org/files/documents/Impact\\_Eval-Review\\_of\\_Outcomes\\_to\\_Impacts-RotI\\_handbook.pdf](http://www.thegef.org/gef/sites/thegef.org/files/documents/Impact_Eval-Review_of_Outcomes_to_Impacts-RotI_handbook.pdf)

evaluation should ascertain to what extent follow-up work has been initiated and how project results will be sustained and enhanced over time. Application of the ROTI method will assist in the evaluation of sustainability.

22. Four aspects of sustainability will be addressed:

- (a) *Socio-political sustainability.* Are there any social or political factors that may influence positively or negatively the sustenance of project results and progress towards impacts? Is the level of ownership by the main national and regional stakeholders sufficient to allow for the project results to be sustained? Are there sufficient government and stakeholder awareness, interests, commitment and incentives to execute, enforce and pursue the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project?
- (b) *Financial resources.* To what extent are the continuation of project results and the eventual impact of the project dependent on continued financial support? What is the likelihood that adequate financial resources<sup>9</sup> will be or will become available to implement the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project? Are there any financial risks that may jeopardize sustenance of project results and onward progress towards impact?
- (c) *Institutional framework.* To what extent is the sustenance of the results and onward progress towards impact dependent on issues relating to institutional frameworks and governance? How robust are the institutional achievements such as governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. required to sustaining project results and to lead those to impact on human behaviour and environmental resources?
- (d) *Environmental sustainability.* Are there any environmental factors, positive or negative, that can influence the future flow of project benefits? Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits?

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

- (a) *catalyzed behavioural changes* in terms of use and application by the relevant stakeholders of: i) technologies and approaches show-cased by the demonstration projects; ii) strategic programmes and plans developed; and iii) assessment, monitoring and management systems established at a national and sub-regional level;
- (b) provided *incentives* (social, economic, market based, competencies etc.) to contribute to catalyzing changes in stakeholder behaviour;
- (c) contributed to *institutional changes*. An important aspect of the catalytic role of the project is its contribution to institutional uptake or mainstreaming of project-piloted approaches in the regional and national demonstration projects;
- (d) contributed to *policy changes* (on paper and in implementation of policy);
- (e) contributed to sustained follow-on financing (*catalytic financing*) from Governments, the GEF or other donors;

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<sup>9</sup> Those resources can be from multiple sources, such as the public and private sectors, income generating activities, other development projects etc.

- (f) created opportunities for particular individuals or institutions (“*champions*”) to catalyze change (without which the project would not have achieved all of its results).

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

### 3. Processes affecting attainment of project results

25. **Preparation and Readiness.** Were the project’s objectives and components clear, practicable and feasible within its timeframe? Were the capacities of executing agencies properly considered when the project was designed? Was the project document clear and realistic to enable effective and efficient implementation? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project implementation? Were counterpart resources (funding, staff, and facilities) and enabling legislation assured? Were adequate project management arrangements in place? Were lessons from other relevant projects properly incorporated in the project design? Were lessons learned and recommendations from Steering Committee meetings adequately integrated in the project approach? What factors influenced the quality-at-entry of the project design, choice of partners, allocation of financial resources etc.? Were GEF environmental and social safeguards considered when the project was designed<sup>10</sup>?

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

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

27. **Stakeholder<sup>11</sup> Participation and Public Awareness.** The term stakeholder should be considered in the broadest sense, encompassing project partners, government institutions, private interest groups, local

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<sup>10</sup> <http://www.thegef.org/gef/node/4562>

<sup>11</sup> Stakeholders are the individuals, groups, institutions, or other bodies that have an interest or stake in the outcome of the project. The term also applies to those potentially adversely affected by the project.

communities etc. The assessment will look at three related and often overlapping processes: (1) information dissemination between stakeholders, (2) consultation between stakeholders, and (3) active engagement of stakeholders in project decision making and activities. The evaluation will specifically assess:

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

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

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

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

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

- (a) Verify the application of proper standards (clarity, transparency, audit etc.) and timeliness of financial planning, management and reporting to ensure that sufficient and timely financial resources were available to the project and its partners;
- (b) Appreciate other administrative processes such as recruitment of staff, procurement of goods and services (including consultants), preparation and negotiation of cooperation agreements etc. to the extent that these might have influenced project performance;
- (c) Present to what extent co-financing has materialized as expected at project approval (see Table 1). Report country co-financing to the project overall, and to support project activities at the national level in particular. The evaluation will provide a breakdown of final actual costs and co-financing for the different project components (see tables in Annex 4).

- (d) Describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project's ultimate objective. Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO's, foundations, governments, communities or the private sector.
31. Analyse the effects on project performance of any irregularities in procurement, use of financial resources and human resource management, and the measures taken by the EA or IA to prevent such irregularities in the future. Appreciate whether the measures taken were adequate.
32. **UNEP Supervision and Backstopping.** The purpose of supervision is to verify the quality and timeliness of project execution in terms of finances, administration and achievement of outputs and outcomes, in order to identify and recommend ways to deal with problems which arise during project execution. Such problems may be related to project management but may also involve technical/institutional substantive issues in which UNEP has a major contribution to make. The evaluators should assess the effectiveness of supervision and administrative and financial support provided by UNEP including:
- (a) The adequacy of project supervision plans, inputs and processes;
  - (b) The emphasis given to outcome monitoring (results-based project management);
  - (c) The realism and candour of project reporting and ratings (i.e. are PIR ratings an accurate reflection of the project realities and risks);
  - (d) The quality of documentation of project supervision activities; and
  - (e) Financial, administrative and other fiduciary aspects of project implementation supervision.
33. **Monitoring and Evaluation.** The evaluation will include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on the assumptions and risks identified in the project document. The evaluation will appreciate how information generated by the M&E system during project implementation was used to adapt and improve project execution, achievement of outcomes and ensuring sustainability. M&E is assessed on three levels:
- (a) *M&E Design.* Projects should have sound M&E plans to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART indicators and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified. The evaluators should use the following questions to help assess the M&E design aspects:
    - Quality of the project logframe as a planning and monitoring instrument; analyse/compare logframe in Project Document, revised logframe (2008) and logframe used in Project Implementation Review reports to report progress towards achieving project objectives;
    - SMART-ness of indicators: Are there specific indicators in the logframe for each of the project objectives? Are the indicators measurable, attainable (realistic) and relevant to the objectives? Are the indicators time-bound?
    - Adequacy of baseline information: To what extent has baseline information on performance indicators been collected and presented in a clear manner? Was the methodology for the baseline data collection explicit and reliable?

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

#### 4. Complementarities with UNEP strategies and programmes

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

- (a) *Linkage to UNEP's Expected Accomplishments and POW 2010-2011.* The UNEP MTS specifies desired results in six thematic focal areas. The desired results are termed Expected Accomplishments. Using the completed ROtI analysis, the evaluation should comment on whether the project makes a tangible contribution to any of the Expected Accomplishments specified in the UNEP MTS. The magnitude and extent of any contributions and the causal linkages should be fully described. Whilst it is recognised that UNEP GEF projects designed prior to the production of the UNEP Medium Term Strategy (MTS)<sup>12</sup>/ Programme of Work (POW) 2010/11 would not necessarily be aligned with the Expected Accomplishments articulated in those documents, complementarities may still exist.
- (b) *Alignment with the Bali Strategic Plan (BSP)*<sup>13</sup>. The outcomes and achievements of the project should be briefly discussed in relation to the objectives of the UNEP BSP.
- (c) *Gender.* Ascertain to what extent project design, implementation and monitoring have taken into consideration: (i) possible gender inequalities in access to and the control over natural resources; (ii) specific vulnerabilities of women and children to environmental degradation or disasters; and (iii) the role of women in mitigating or adapting to environmental changes and engaging in environmental protection and rehabilitation. Appreciate whether the intervention is likely to have any lasting differential impacts on gender equality and the relationship between women and the environment. To what extent do unresolved gender inequalities affect sustainability of project benefits?

<sup>12</sup> <http://www.unep.org/PDF/FinalMTSGCSS-X-8.pdf>

<sup>13</sup> <http://www.unep.org/GC/GC23/documents/GC23-6-add-1.pdf>



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

### **E. The Consultants' Team**

35. For this evaluation, a team of ... independent consultants will be hired, preferably of mixed gender, at least one of which is from the project sub-region. The evaluation team will combine the following expertise and experience:

- (a) Evaluation of environmental projects
- (b) Expertise in ...
- (c) Extensive knowledge of ...
- (d) ...

36. The **Team Leader** will be responsible for coordinating the data collection and analysis phase of the evaluation, and preparing the main report. (S)He will ensure that all evaluation criteria are adequately covered by the team. **Annex 6** provides a matrix which presents the distribution of responsibilities between evaluation team members (to be finalized in consultation with the Team Leader).

37. The **Supporting Consultant** will prepare a technical working paper that will be appended to the main report, the content of which will be agreed upon with the Team Leader. The Supporting Consultant is also expected to contribute to selected sections of the main report as agreed with the Team Leader, and provide constructive comments on the draft report prepared by the Team Leader.

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

### **F. Evaluation Deliverables and Review Procedures**

39. The Team Leader will prepare an **inception report** (see Annex 2(a) of TORs for Inception Report outline) containing a thorough review of the project design quality and the evaluation framework. The review of design quality will cover the following aspects:

- Project relevance (see paragraph 20 (b));
- A desk-based Theory of Change of the project (see Annex 8 - ROTI analysis);
- Sustainability consideration (see paragraphs 21-22) and measures planned to promote replication and upscaling (see paragraph 23);
- Preparation and readiness (see paragraph 25);
- Financial planning (see paragraph 30);
- M&E design (see paragraph 33(a));
- Complementarities with UNEP strategies and programmes (see paragraph 34);
- Using the above, complete and assessment of the overall quality of the project design (see Annex 9);

- The evaluation framework should summarize the information available from project documentation against each of the main evaluation parameters. Any gaps in information should be identified and methods for additional data collection, verification and analysis should be specified. A draft schedule for the evaluation process should be presented.

The evaluation framework will present in further detail the evaluation questions under each criterion with their respective indicators and data sources. The inception report will be submitted for review by the Evaluation Office before the evaluation team conducts any field visits.

40. **The main evaluation report** should be brief (no longer than 35 pages – excluding the executive summary and annexes), to the point and written in plain English. The report will follow the annotated Table of Contents outlined in Annex 2 (b). It must explain the purpose of the evaluation, exactly what was evaluated and the methods used (with their limitations). The report will present evidence-based and balanced findings, consequent conclusions, lessons and recommendations, which will be cross-referenced to each other. The report should be presented in a way that makes the information accessible and comprehensible. Any dissident views in response to evaluation findings will be appended in footnote or annex as appropriate.

41. **Technical working paper.** The format and contents of the working paper prepared by the Supporting Consultants should be agreed upon with the Team Leader and approved by the UNEP Evaluation Office before any data collection and analysis work is undertaken. It is recommended that the working papers follow the same structure as the main evaluation report, for easy reference by the Team Leader (Annex 2 (b)). The Team Leader will carry out a first review of the working papers and provide comments to the Supporting Consultants for improvement. Only a version acceptable to the Team Leader will be submitted to the EO as an appendix to the draft main report.

42. **Report summary.** The Team Leader will prepare a 15-slide presentation summarizing the key findings, lessons learned and recommendations of the evaluation. This presentation will be presented at the final Steering Committee meeting of the project (tentatively planned ... 2011). The purpose of this presentation is to engage the main project partners in a discussion on the evaluation results.

43. **Review of the draft evaluation report.** The Team Leader will submit the zero draft report latest by ...2011 to the UNEP EO and revise the draft following the comments and suggestions made by the EO. The EO will then share the first draft report with the UNEP GEF Coordination Office (Nairobi) and the UNEP Division for [where the Task Manager is located]. The UNEP Task Manager will forward the first draft report to the other project stakeholders, in particular [add relevant partners] for review and comments. Stakeholders may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. Comments would be expected within two weeks after the draft report has been shared. Any comments or responses to the draft report will be sent to the UNEP EO for collation. The EO will provide the comments to the Team Leader for consideration in preparing the final draft report. The Team Leader will submit the final draft report no later than 2 weeks after reception of stakeholder comments. The Team Leader will prepare a **response to comments** that contradict the findings of the evaluation team and could therefore not be accommodated in the final report. This response will be shared by the EO with the interested stakeholders to ensure full transparency.

44. Consultations will be held between the consultants, EO staff, the UNEP/GEF, UNEP/[relevant Division], and key members of the project execution team. These consultations will seek feedback on the proposed recommendations and lessons.

45. **Submission of the final Terminal Evaluation report.** The final report shall be submitted by Email to:

Segbedzi Norgbey, Head  
UNEP Evaluation Office  
P.O. Box 30552-00100  
Nairobi, Kenya  
Tel.: (+254-20) 762 3387  
Email: [segbedzi.norgbey@unep.org](mailto:segbedzi.norgbey@unep.org)

46. The Head of Evaluation will share the report with the following persons:

Maryam Niamir-Fuller, Director  
UNEP/GEF Coordination Office  
P.O. Box 30552-00100  
Nairobi, Kenya  
Tel: (+254-20) 762 4686  
Email: [maryam.niamir-fuller@unep.org](mailto:maryam.niamir-fuller@unep.org)

..., Director  
UNEP/[relevant Division]  
P.O. Box 30552-00100  
Nairobi, Kenya  
Tel:  
Email:

Others

47. The final evaluation report will be published on the UNEP Evaluation Office web-site [www.unep.org/eou](http://www.unep.org/eou) and may be printed in hard copy. Subsequently, the report will be sent to the GEF Office of Evaluation for their review, appraisal and inclusion on the GEF website.

48. As per usual practice, the UNEP EO will prepare a **quality assessment** of the zero draft and final draft report, which is a tool for providing structured feedback to the evaluation consultants. The quality of the report will be assessed and rated against both GEF and UNEP criteria as presented in Annex 5.

49. The UNEP Evaluation Office will also prepare a **commentary** on the final evaluation report, which presents the EO ratings of the project based on a careful review of the evidence collated by the evaluation team and the internal consistency of the report. These ratings are the final ratings that the UNEP Evaluation Office will submit to the GEF Office of Evaluation.

### ***G. Resources and Schedule of the Evaluation***

50. This Terminal Evaluation will be undertaken by three independent evaluation consultants contracted by the UNEP Evaluation Office. The consultants will work under the overall responsibility of the UNEP Evaluation Office and they will consult with the EO on any procedural and methodological matters related to the evaluation. It is, however, the consultants' individual responsibility to arrange for their travel, obtain documentary evidence, meetings with stakeholders, field visits, and any other logistical matters related to their assignment. The UNEP Task Manager, UNDP Regional Technical Advisor, UNDP Country Offices and regional and national project staff will provide logistical support (introductions, meetings, transport, lodging etc.) for the country visits where necessary, allowing the consultants to conduct the evaluation as efficiently and independently as possible.

51. The **Team Leader** will be hired for X weeks. (S)He will travel to ....

52. The **Supporting Consultant** will be hired for Y weeks. (S)he will travel to ...

### ***H. Schedule of Payment***

Lump Sum.

53. The consultants will be hired under an individual Special Service Agreement (SSA). The fee will be estimated as a lumpsum, inclusive of all expenses such as travel, accommodation and incidental expenses.

54. The consultants will receive an initial payment covering the travel costs upon signature of the contract.

Fee ONLY.

55. The consultant will be hired under an individual Special Service Agreement (SSA) and is NOT inclusive of all expenses such as airfares, in-country travel, accommodation, incidental and terminal expenses. Air tickets will be paid separately by UNEP and 75% of the DSA for each authorised travel mission will be paid up front. Local in-country travel and communication costs will be reimbursed on the production of acceptable receipts. Terminal expenses and residual DSA entitlements (25%) will be paid after mission completion.

56. The Team Leader will receive 40% of the honorarium portion of his/her fee upon acceptance of a draft report deemed complete and of acceptable quality by the EO. The remainder will be paid upon satisfactory completion of the work.

57. The Supporting Consultant will be paid the honoraria in one single payment upon satisfactory completion of their work. The Team Leader will advise the EO whether the Supporting Consultant has provided satisfactory inputs in the evaluation.

58. In case the consultants are not able to provide the deliverables in accordance with these TORs, in line with the expected quality standards by the UNEP Evaluation Office, payment may be withheld at the discretion of the Head of the Evaluation Office until the consultants have improved the deliverables to meet UNEP's quality standards.

59. If the consultants fail to submit a satisfactory final product to UNEP in a timely manner, i.e. within one month after the end date of their contract, the Evaluation Office reserves the right to employ additional human resources to finalize the report, and to reduce the consultants' fees by an amount equal to the additional costs borne by the Evaluation Office to bring the report up to standard.

## Annex 1. Project outputs and demonstration projects

Table A1.1. Project components and outputs

<b>Component</b>	<b>Outputs</b>
<u>Component I</u>	Output 1.1:
...	Output 1.2:
	...
<u>Component II</u>	Output 2.1:
...	Output 2.2:
	...
<u>Component III</u>	Output 3.1:
...	Output 3.2:
	...
...	...

Table A1.2. Demonstration projects under the project

<b>Demonstration project</b>	<b>Scope</b>	<b>Component</b>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

### Annex 2(a). Inception Report Outline

Section	Notes	Data Sources	Approx No. of pages
<b>1. Introduction</b>	Brief introduction to the project and evaluation.		1 max
<b>2. Project Background</b>	Summarise the project context and rationale. How has the context of the project changed since project design?	Background information on context	2 max
<b>3. Review of Project Design</b>	Summary of project design strengths and weaknesses. Complete the Template for assessment of the quality of project design (Annex of the Terms of Reference).	Project document and revisions, MTE/MTR if any.	2 Max + Completed template in Annex of inception report
<b>4. Theory of Change Analysis</b>	<p>The 'theory of change' should be developed using the process described in Annex 8 (Introduction to Theory of Change/Impact pathways, the ROTI Method and the ROTI results score sheet) of the TORs.</p> <p>The Evaluation Office can provide examples of TOC diagrams on request.</p> <p>The diagram can be represented horizontally or vertically. The diagram should be explained in a narrative.</p>	Project document narrative, logical framework and budget tables. Review of other project related documents.	-Diagram(s) - Narrative 2 pages max
<b>5. Evaluation Process Plan</b>	<p>This section should include:</p> <ul style="list-style-type: none"> <li>-The evaluation framework- <ul style="list-style-type: none"> <li>• Detailed evaluation questions (including new questions raised by review of project design and theory of change analysis).</li> <li>• Data Sources and Indicators</li> </ul> </li> </ul> <p>This can be presented as a matrix for ease of use, showing which data sources will be used to answer which questions.</p> <ul style="list-style-type: none"> <li>- Distribution of roles and responsibilities among evaluation consultants (in case of larger evaluation teams). If needed, can be expanded in Annex</li> <li>- Revised timelines (dates of travel and key evaluation milestones).</li> </ul>	Review of all project documents. Discussion with project team on logistics.	8 max

<b>6. Annexes</b>	<ul style="list-style-type: none"> <li>- Completed table of the overall quality of project design</li> <li>-List of individuals and documents consulted for the inception report</li> <li>- List of documents and individuals to be consulted</li> </ul>		
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### Annex 2(b). Annotated Table of Contents of the Main Report

<b>Project Identification Table</b>	An updated version of the table in Section I.A. of these TORs
<b>Executive Summary</b>	Overview of the main findings, conclusions and recommendations of the evaluation. It should encapsulate the essence of the information contained in the report to facilitate dissemination and distillation of lessons. The main points for each evaluation parameter should be presented here (with a summary ratings table), as well as the most important lessons and recommendations. Maximum 4 pages.
<b>I. Evaluation Background</b>	
A. Context	A. Overview of the broader institutional and country context, in relation to the project's objectives.
B. The Project	B. Presentation of the project: rationale, objectives, components, intervention areas and target groups, milestones in design, implementation and completion, implementation arrangements and main partners, financing (amounts and sources), modifications to design before or during implementation.
C. Evaluation objectives, scope and methodology	C. Presentation of the evaluation's purpose, evaluation criteria and key questions, evaluation timeframe, data collection and analysis instruments used, places visited, types of stakeholders interviewed, and limitations of the evaluation.
<b>II. Project Performance and Impact</b>	This section is organized according to the 4 categories of evaluation criteria (see section D of these TORs) and provides factual evidence relevant to the questions asked and sound analysis and interpretations of such evidence. This is the main substantive section of the report. Ratings are provided at the end of the assessment of each evaluation criterion.
A. Attainment of objectives and planned results	
B. Sustainability and catalytic role	
C. Processes affecting attainment of project results D. Complementarity with UNEP, UNDP and UNIDO programmes and strategies	
<b>III. Conclusions and Recommendations</b>	

A. Conclusions	This section should summarize the main findings of the evaluation, told in a logical sequence from cause to effect. It is suggested to start with the positive achievements and a short explanation why these could be achieved, and, then, to present the less successful aspects of the project with a short explanation why. The conclusions section should end with the overall assessment of the project. Findings should be cross-referenced to the main text of the report (using the paragraph numbering). The overall ratings table should be inserted here (see Annex 2).
B. Lessons Learned	Lessons learned should be anchored in the main findings of the evaluation. In fact, no lessons should appear which are not based upon a conclusion of the evaluation. The number of lessons learned should be limited. Lessons learned are rooted in real project experiences, i.e. based on good practices and successes which could be replicated or derived from problems encountered and mistakes made which should be avoided in the future. Lessons learned must have the potential for wider application and use. Lessons should briefly describe the context from which they are derived and specify the contexts in which they may be useful.
C. Recommendations	As for the lessons learned, all recommendations should be anchored in the conclusions of the report, with proper cross-referencing, and their number should be limited to 3 or 4. Recommendations are actionable proposals on how to resolve concrete problems affecting the project or the sustainability of its results. They should be feasible to implement within the timeframe and resources available (including local capacities), specific in terms of who would do what and when, and set a measurable performance target. In some cases, it might be useful to propose options, and briefly analyze the pros and cons of each option.
<b>Annexes</b>	<p>These may include additional material deemed relevant by the evaluator but must include:</p> <ol style="list-style-type: none"> <li>1. Evaluation TORs</li> <li>2. The evaluation framework (second part of the inception report)</li> <li>3. Evaluation program, containing the names of locations visited and the names (or functions) of people met</li> <li>4. Bibliography</li> <li>5. Summary co-finance information and a statement of project expenditure by activity (See annex of these TORs)</li> <li>6. The review of project design (first part of the inception report)</li> <li>7. Technical working paper</li> <li>8. Brief CVs of the consultants</li> </ol> <p>TE reports will also include any formal response/ comments from the project management team</p>



	and/ or the country focal point regarding the evaluation findings or conclusions as an annex to the report, however, such will be appended to the report by UNEP Evaluation Office.
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Examples of UNEP GEF Terminal Evaluation Reports are available at [www.unep.org/eou](http://www.unep.org/eou).

### ANNEX 3. EVALUATION RATINGS

The evaluation will provide individual ratings for the evaluation criteria described in section II.D. of these TORs. Some criteria contain sub-criteria which require separate ratings (i.e. sustainability and M&E). Furthermore, an aggregated rating will be provided for Relevance, effectiveness and efficiency under the category “Attainment of project objectives and results”.

Most criteria will be rated on a six-point scale as follows: Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU). Sustainability is rated from Highly Likely (HL) down to Highly Unlikely (HU).

In the conclusions section of the report, ratings will be presented together in a table, with a brief justification cross-referenced to the findings in the main body of the report. Please note that the order of the evaluation criteria in the table will be slightly different from the order these are treated in the main report; this is to facilitate comparison and aggregation of ratings across GEF project evaluation reports.

Criterion	Summary Assessment	Rating
<b>A. Attainment of project objectives and results</b>		HS → HU
1. Effectiveness		HS → HU
2. Relevance		HS → HU
3. Efficiency		HS → HU
<b>B. Sustainability of project outcomes</b>		HL → HU
1. Financial		HL → HU
2. Socio-political		HL → HU
3. Institutional framework		HL → HU
4. Environmental		HL → HU
<b>C. Catalytic role</b>		HS → HU
<b>D. Stakeholders involvement</b>		HS → HU
<b>E. Country ownership / driven-ness</b>		HS → HU
<b>F. Achievement of outputs and activities</b>		HS → HU
<b>G. Preparation and readiness</b>		HS → HU
<b>H. Implementation approach</b>		HS → HU
<b>I. Financial planning and management</b>		HS → HU
<b>J. Monitoring and Evaluation</b>		HS → HU
1. M&E Design		HS → HU
2. M&E Plan Implementation		HS → HU
3. Budgeting and funding for M&E activities		HS → HU
<b>K. UNEP and UNDP Supervision and backstopping</b>		HS → HU
1. UNEP		HS → HU
2. UNDP		HS → HU

**Rating of Attainment of project objectives and results.** A compound rating is given to the category based on the assessment of relevance, effectiveness and efficiency. This aggregated rating is not a simple average of the separate ratings given to the evaluation criteria, but an overall judgement by the consultants. Relevance and effectiveness, however, will be considered as critical criteria. This means that the aggregated rating for Attainment of objectives and results may not be higher than the lowest rating on either of these two criteria.

**Ratings on sustainability.** According to the GEF Office of Evaluation, all the dimensions of sustainability are deemed critical. Therefore, the overall rating for sustainability will not be higher than the lowest rating on the separate dimensions.

**Ratings of monitoring and evaluation.** The M&E system will be rated on M&E design, M&E plan implementation, and budgeting and funding for M&E activities (the latter sub-criterion is covered in the main report under M&E design) as follows:

Highly Satisfactory (HS): There were no shortcomings in the project M&E system.

Satisfactory(S): There were minor shortcomings in the project M&E system.

Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.

Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.

Unsatisfactory (U): There were major shortcomings in the project M&E system.

Highly Unsatisfactory (HU): The Project had no M&E system.

M&E plan implementation will be considered critical for the overall assessment of the M&E system. Thus, the overall rating for M&E will not be higher than the rating on M&E plan implementation.

#### Annex 4. Project costs and co-financing tables

##### Project Costs

Component/sub-component	Estimated cost at design	Actual Cost	Expenditure (actual/planned)	ratio

##### Co-financing

Co financing (Type/Source)	IA own Financing (mill US\$)		Government (mill US\$)		Other* (mill US\$)		Total (mill US\$)		Total Disbursed (mill US\$)
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	
- Grants									
- Loans									
- Credits									
- Equity investments									
- In-kind support									
- Other (*)									
-									
-									
<b>Totals</b>									

\* This refers to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

## Annex 5. Quality Assessment of the Evaluation Report

All UNEP evaluation reports are subject to a quality assessment by the Evaluation Office. The quality assessment is used as a tool for providing structured feedback to the evaluation consultants. The quality of the draft evaluation report is assessed and rated against the following criteria:

GEF Report Quality Criteria	UNEP EO Assessment	Rating
A. Did the report present an assessment of relevant outcomes and achievement of project objectives in the context of the focal area program indicators if applicable?		
B. Was the report consistent and the evidence complete and convincing and were the ratings substantiated when used?		
C. Did the report present a sound assessment of sustainability of outcomes?		
D. Were the lessons and recommendations supported by the evidence presented?		
E. Did the report include the actual project costs (total and per activity) and actual co-financing used?		
F. Did the report include an assessment of the quality of the project M&E system and its use for project management?		
<b>UNEP additional Report Quality Criteria</b>		
G. Quality of the lessons: Were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
H. Quality of the recommendations: Did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?'). Can they be implemented? Did the recommendations specify a goal and an associated performance indicator?		
I. Was the report well written? (clear English language and grammar)		
J. Did the report structure follow EOU guidelines, were all requested Annexes included?		
K. Were all evaluation aspects specified in the TORs adequately addressed?		
L. Was the report delivered in a timely manner		

$$\text{Quality} = (2*(0.3*(A + B) + 0.1*(C+D+E+F)) + 0.3*(G + H) + 0.1*(I+J+K+L))/3$$

The Totals are rounded and converted to the scale of HS to HU

Rating system for quality of Terminal Evaluation reports: A number rating between 1 and 6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1.

## Annex 6 – Matrix for Distribution of responsibilities and tasks among evaluation consultants

L: Lead assessor

S: Support in data collection and analysis

Evaluation Criteria		Team Leader	Supporting Consultant 1	Supporting Consultant 2
Attainment of Objectives and Planned Results	Achievement of Outputs and Activities	See table below		
	Relevance	L		
	Effectiveness			
	<ul style="list-style-type: none"> <li>• Achievement of main objective</li> <li>• Achievement of component objectives:</li> </ul>	L		
	a. Component I	L		
	b. Component II		L	
	c. Component III			L
	d. Component IV		L	
	e. Component V	L		
	Efficiency	L		
Review of Outcomes to Impacts (ROtI)	L	S	S	
Sustainability and catalytic role	Socio-political sustainability	L		
	Financial resources	L		
	Institutional framework	L		
	Environmental sustainability			L
	Catalytic Role and Replication	L		
Processes affecting attainment of project results	Preparation and Readiness	L		
	Implementation Approach and Adaptive Management	L		
	Stakeholder Participation and Public Awareness	L		
	Country Ownership and Driven-ness	L		
	Financial Planning and Management	L		
	UNEP and UNDP Supervision and Backstopping	L		
	Monitoring and Evaluation	L		
Complementarities with the UNEP Medium Term Strategy and Programme of Work	Linkage to UNEP's EAs and POW 2010-2011	L		
	Alignment with the Bali Strategic Plan (BSP)	L		
	South-South Cooperation	L		

	Achievement of Outputs and Activities	Team Leader	Supporting Consultant 1	Supporting Consultant 2
Component I	Output 1.1: Filling of gaps in regional monitoring methods/standards/etc. by training and at-sea demonstrations for contaminant levels in water, sediments, and biota.		L	
	Output 1.2: Identifying and filling of gaps in the TDA, including biodiversity, socio-economic conditions, legal/ regulatory review, stakeholder analysis, hot spots, contaminant levels	L		
	Output 1.3: Updating of TDA following filling of gaps	L		
	Output 1.4: Preparation and endorsement of National Action Plans	L		

	Output 1.5: Finalizing and endorsement of regional Strategic Action Programme using methodological guidance from Train-Sea-Coast TDA/SAP course	L		
	Output 1.6: Holding of donors' conference to mobilize commitments to SAP implementation	L		
	Output 1.7: Formulation of arrangements for sustainable financing of ecosystem management of the GCLME	L		
	Output 1.8: Development and recommendation of economic instruments and incentives to promote preventive measures to decrease both land and sea-based sources of pollution as well as promote adequate ecosystem management in the region		L	
Component II	Output 2.1: Demonstration of ecosystem-wide stock assessment methods including regional surveys (Regional Demonstration Project)		L	
	Output 2.2: Development of methods and estimates for sustainable yields for dominant commercially-important fisheries species		L	
	Output 2.3: Evaluation of productivity with regards to its carrying capacity for living marine resources of the ecosystem (Regional Demonstration Project)		L	
	Output 2.4: Development of Regional Agreements and Guinea Current Commission		L	
	Output 2.5: Assessment and modifications drafted to the National legal Frameworks to achieve sustainable fisheries		L	
	Output 2.6: Development of fisheries Management Plans for at least three fisheries		L	
	Output 2.7: Assessment of existing coastal aquaculture and mariculture and determination of ecosystem sustainable capacity for future development, including identification of investments and legislation for SAP		L	
Component III	Output 3.1: Development of GCLME Ecosystem-wide Biodiversity Action Plan, including Protected Areas based on Biodiversity Action Plans (National Demonstration Project)			L
	Output 3.2: Demonstration of establishment of Marine Protected Area in Benin [BENIN]			L
	Output 3.3: Demonstration of restoration of priority mangrove areas (National Demonstration Project <del>Nigeria-Nyapa Palm</del> ) [NIGERIA]			L
	Output 3.4: Demonstration of use of Integrated Coastal Area and River Basin Management (ICARM) and assessment of Physical Alteration and Destruction of Habitat (PADH) for habitat protection (National Demonstration Project Cameroun) [CAMEROUN]			L
	Output 3.5: Assessment of status of introduced species and their threats to the biodiversity of the GCLME region; development of legal/regulatory mechanisms for their control, including promoting adoption and/or ratification of new international Convention on Ballast Water and Sediments.			L

	Output 3.6: Performing of analysis of gaps in national legislation and drafting of improvements to legislation regarding key elements of biodiversity identified in the TDA, and habitats			L
	Output 3.7: Development of cost-effective mitigation strategies for restoring natural littoral sediment flow/budget protection of shorelines and critical coastal habitats, including studies, investments for SAP, and legal/regulatory mechanisms (National Demonstration Project) [COTE D'IVOIRE]			L
<u>Component IV</u>	Output 4.1: Facilitation of development of regionally-integrated and consistent National Programmes of Action for Land-Based Activities (NPA-LBA), including updating inventories of pollution and habitat hot spots		L	
	Output 4.2: Integration of NPA-LBA into NAPs		L	
	Output 4.3: Development of a protocol on LBA for the Abidjan Convention		L	
	Output 4.4: Completion of ecosystem-wide assessment of marine maritime pollution prevention measures, contingency planning, and spill response capabilities		L	
	Output 4.5: Development of regional systems for cooperation in cases of oil spills and any other major marine pollution incidents (customs, communications, response, liability and compensation)		L	
	Output 4.6: Facilitation of process to reform legislation in selected countries to adopt and implement international conventions (e.g., MARPOL, OPRC) as related to oil and gas activities		L	
	Output 4.7: Strengthening, improvement, and demonstration of methods to reduce nutrient influx to the ecosystem (National Demonstration Project) [TOGO]		L	
	Output 4.8: Development of investment opportunities for the SAP to reduce ecosystem threats identified in the updated TDA (National Demonstration Project) [GHANA]		L	
<u>Component V</u>	Output 5.1: Development of a regional project coordination mechanism	L		
	Output 5.2: Development of effective Steering Committee	L		
	Output 5.3: Establishment of Intersectoral/ Interministerial/ Ministerial Coordination	L		
	Output 5.4: Identification, strengthening and involvement of stakeholders and communication	L		
	Output 5.5: Development of Ecosystem Information System (EIS) for GCLME, including cooperation with other available regional EIS (Regional Demonstration Project)			L
	Output 5.6: Monitoring and Evaluation (M&E)	L		



	Output 5.7: Development of regional coordination mechanism (an Interim Guinea Current Commission, followed by establishment of a full-fledged Commission)	L		
	Output 5.8: Capacity building for the IGCC/GCC	L		

## **Annex 7. Documentation list for the evaluation to be provided by the UNEP Task Manager**

- Project design documents
- Project supervision plan, with associated budget
- Correspondence related to project
- Supervision mission reports
- Steering Committee meeting documents, including agendas, meeting minutes, and any summary reports
- Project progress reports, including financial reports submitted
- Cash advance requests documenting disbursements
- Annual Project Implementation Reports (PIRs)
- Management memos related to project
- Other documentation of supervision feedback on project outputs and processes (e.g. comments on draft progress reports, etc.).
- Extension documentation. Has a project extension occurred?
- Project revision documentation.
- Budget revision documentation.
- Project Terminal Report (draft if final version not available)

## Annex 8. Introduction to Theory of Change / Impact pathways, the ROTI Method and the ROTI Results Score sheet

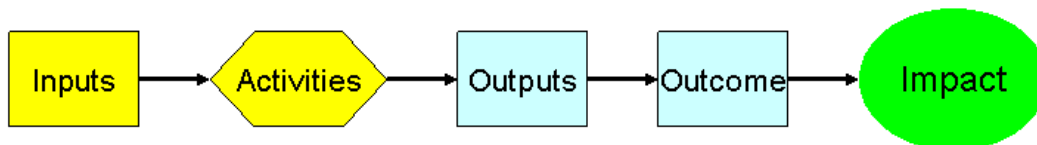
Terminal evaluations of projects are conducted at, or shortly after, project completion. At this stage it is normally possible to assess the achievement of the project's outputs. However, the possibilities for evaluation of the project's outcomes are often more limited and the feasibility of assessing project **impacts** at this time is usually severely constrained. Full impacts often accrue only after considerable time-lags, and it is common for there to be a lack of long-term baseline and monitoring information to aid their evaluation. Consequently, substantial resources are often needed to support the extensive primary field data collection required for assessing impact and there are concomitant practical difficulties because project resources are seldom available to support the assessment of such impacts when they have accrued – often several years after completion of activities and closure of the project.

Despite these difficulties, it is possible to enhance the scope and depth of information available from Terminal Evaluations on the achievement of results through rigorous review of project progress along the pathways from outcome to impact. Such reviews identify the sequence of conditions and factors deemed necessary for project outcomes to yield impact and assess the current status of and future prospects for results. In evaluation literature these relationships can be variously described as 'Theories of Change', Impact 'Pathways', 'Results Chains', 'Intervention logic', and 'Causal Pathways' (to name only some!).

### Theory of Change (ToC) / impact pathways

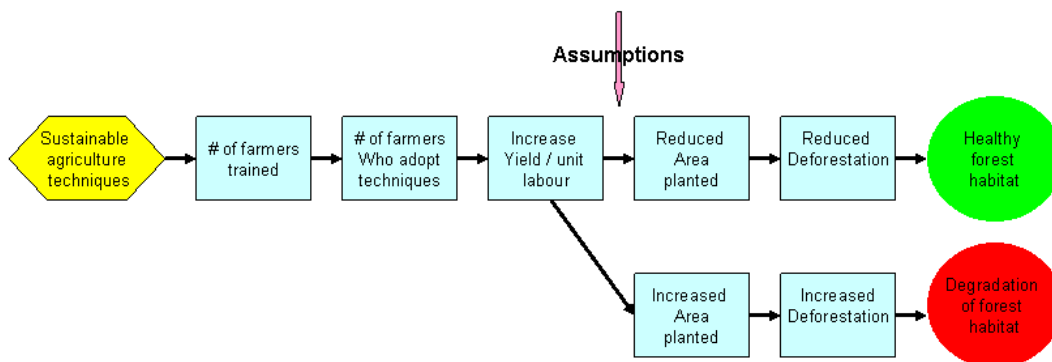
Figure 1 shows a generic impact pathway which links the standard elements of project logical frameworks in a graphical representation of causal linkages. When specified with more detail, for example including the key users of outputs, the processes (the arrows) that lead to outcomes and with details of performance indicators, analysis of impact pathways can be invaluable as a tool for both project planning and evaluation.

Figure 1. A generic results chain, which can also be termed an 'Impact Pathway' or Theory of Change.



The pathways summarise casual relationships and help identify or clarify the assumptions in the intervention logic of the project. For example, in the Figure 2 below the eventual impact depends upon the behaviour of the farmers in using the new agricultural techniques they have learnt from the training. The project design for the intervention might be based on the upper pathway assuming that the farmers can now meet their needs from more efficient management of a given area therefore reducing the need for an expansion of cultivated area and ultimately reducing pressure on nearby forest habitat, whereas the evidence gathered in the evaluation may in some locations follow the lower of the two pathways; the improved faming methods offer the possibility for increased profits and create an incentive for farmers to cultivate more land resulting in clearance or degradation of the nearby forest habitat.

Figure 2. An impact pathway / TOC for a training intervention intended to aid forest conservation.



The GEF Evaluation Office has recently developed an approach that builds on the concepts of theory of change / causal chains / impact pathways. The method is known as Review of Outcomes to Impacts (ROtI)<sup>14</sup> and has three distinct stages:

- a. Identifying the project's intended impacts
- b. Review of the project's logical framework
- c. Analysis and modelling of the project's outcomes-impact pathways

The **identification of the projects intended impacts** should be possible from the 'objectives' statements specified in the official project document. The next stage is to **review the project's logical framework** to assess whether the design of the project is consistent with, and appropriate for, the delivery of the intended impact. The method requires verification of the causal logic between the different hierarchical levels of the logical framework moving 'backwards' from impacts through outcomes to the outputs; the activities level is not formally considered in the ROtI method<sup>15</sup>. The aim of this stage is to develop an understanding of the causal logic of the project intervention and to identify the key 'impact pathways'. In reality such process are often complex; they often involve multiple actors and decision-processes and are subject to time-lags, meaning that project impact often accrue long after the completion of project activities.

The third stage involves analysis of the 'impact pathways' that link project outcomes to impacts. The pathways are analysed in terms of the '**assumptions**' and '**impact drivers**' that underpin the processes involved in the transformation of outcomes to impacts via **intermediate states** (see Figure 3). Project outcomes are the direct intended results stemming from the outputs, and they are likely to occur either towards the end of the project or in the short term following project completion. **Intermediate states** are the transitional conditions between the project's immediate outcomes and the intended impact. They are necessary conditions for the achievement of the intended impacts and there may be more than one intermediate state between the immediate project outcome and the eventual impact.

**Impact drivers** are defined as the significant factors that if present are expected to contribute to the realization of the intended impacts and **can be influenced** by the project / project partners & stakeholders. **Assumptions** are the significant factors that if present are expected to contribute to the realization of the intended impacts but are largely **beyond the control of the project** / project partners & stakeholders. The impact drivers and assumptions are ordinarily considered in Terminal Evaluations when assessing the sustainability of the project.

Since project logical frameworks do not often provide comprehensive information on the processes by which project outputs yield outcomes and eventually lead, via 'intermediate states' to impacts, the impact pathways need to be carefully examined and the following questions addressed:

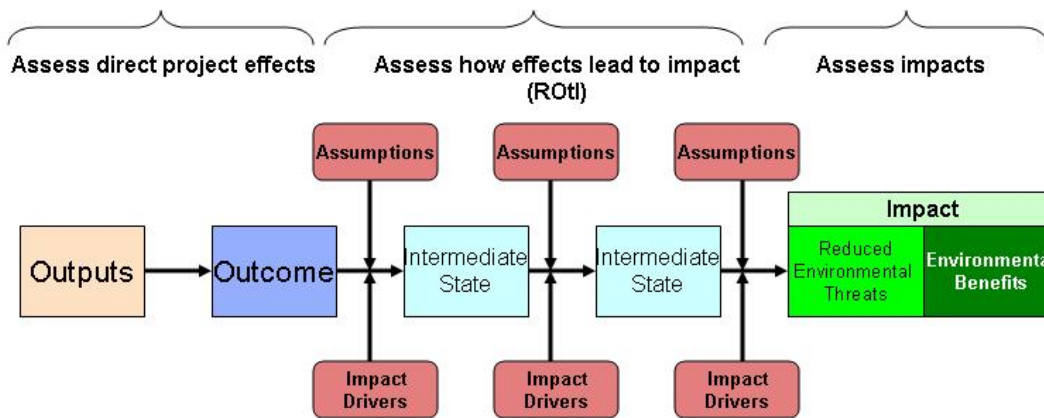
- o Are there other causal pathways that would stem from the use of project outputs by other potential user groups?
- o Is (each) impact pathway complete? Are there any missing intermediate states between project outcomes and impacts?
- o Have the key impact drivers and assumptions been identified for each 'step' in the impact pathway.

Figure 3. A schematic 'impact pathway' showing intermediate states, assumptions and impact drivers (adapted from GEF EO 2009).

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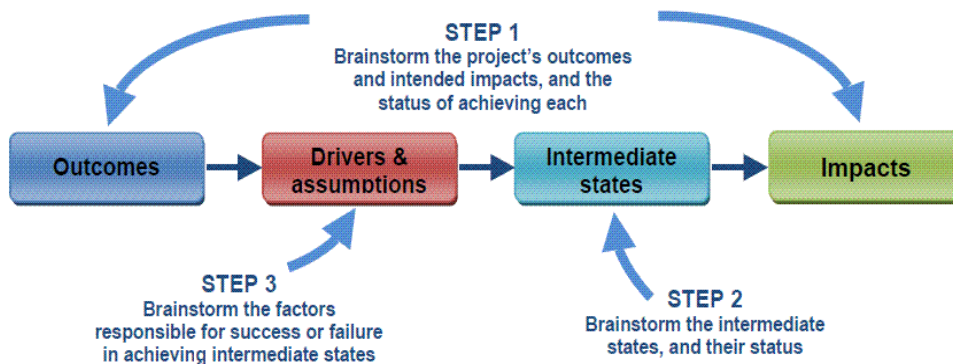
<sup>14</sup> GEF Evaluation Office (2009). ROtI: Review of Outcomes to Impacts Practitioners Handbook. [http://www.gefweb.org/uploadedFiles/Evaluation\\_Office/OPS4/Roti%20Practitioners%20Handbook%2015%20June%202009.pdf](http://www.gefweb.org/uploadedFiles/Evaluation_Office/OPS4/Roti%20Practitioners%20Handbook%2015%20June%202009.pdf)

<sup>15</sup> Evaluation of the efficiency and effectiveness in the use of resources to generate outputs is already a major focus within UNEP Terminal Evaluations.



The process of identifying the impact pathways and specifying the impact drivers and assumptions can be done as a desk exercise by the evaluator or, preferably, as a group exercise, led by the evaluator with a cross-section of project stakeholders as part of an evaluation field mission or both. Ideally, the evaluator would have done a desk-based assessment of the project’s theory of change and then use this understanding to facilitate a group exercise. The group exercise is best done through collective discussions to develop a visual model of the impact pathways using a card exercise. The component elements (outputs, outcomes, impact drivers, assumptions intended impacts etc.) of the impact pathways are written on individual cards and arranged and discussed as a group activity. Figure 4 below shows the suggested sequence of the group discussions needed to develop the ToC for the project.

Figure 4. Suggested sequencing of group discussions (from GEF EO 2009)



Once the theory of change model for the project is complete the evaluator can assess the design of the project intervention and collate evidence that will inform judgments on the extent and effectiveness of implementation, through the evaluation process. Performance judgments are made always noting that project contexts can change and that adaptive management is required during project implementation.

The ROTl method requires ratings for outcomes achieved by the project and the progress made towards the ‘intermediate states’ at the time of the evaluation. According the GEF guidance on the method; “*The rating system is intended to recognize project preparation and conceptualization that considers its own assumptions, and that seeks to remove barriers to future scaling up and out. Projects that are a part of a long-term process need not at all be “penalized” for not achieving impacts in the lifetime of the project: the system recognizes projects’ forward thinking to eventual impacts, even if those impacts are eventually achieved by other partners and stakeholders, albeit with achievements based on present day, present project building blocks.*” For example, a project receiving an “AA” rating appears likely to deliver impacts, while for a project receiving a “DD” this would seem unlikely, due to low achievement in outcomes and the limited likelihood of achieving the intermediate states needed for eventual impact (see Table 1).

Table 1. Rating scale for outcomes and progress towards ‘intermediate states’

<b>Outcome Rating</b>	<b>Rating on progress toward Intermediate States</b>
D: The project’s intended outcomes were not delivered	D: No measures taken to move towards intermediate states.
C: The project’s intended outcomes were delivered, but were not designed to feed into a continuing process after project funding	C: The measures designed to move towards intermediate states have started, but have not produced results.
B: The project’s intended outcomes were delivered, and were designed to feed into a continuing process, but with no prior allocation of responsibilities after project funding	B: The measures designed to move towards intermediate states have started and have produced results, which give no indication that they can progress towards the intended long term impact.
A: The project’s intended outcomes were delivered, and were designed to feed into a continuing process, with specific allocation of responsibilities after project funding.	A: The measures designed to move towards intermediate states have started and have produced results, which clearly indicate that they can progress towards the intended long term impact.

Thus a project will end up with a two letter rating e.g. AB, CD, BB etc. In addition the rating is given a ‘+’ notation if there is evidence of impacts accruing within the life of the project. The possible rating permutations are then translated onto the usual six point rating scale used in all UNEP project evaluations in the following way.

Table 2. Shows how the ratings for ‘achievement of outcomes’ and ‘progress towards intermediate states translate to ratings for the ‘Overall likelihood of impact achievement’ on a six point scale.

Highly Likely	Likely	Moderately Likely	Moderately Unlikely	Unlikely	Highly Unlikely
AA AB BA CA BB+ CB+ DA+ DB+	BB CB DA DB AC+ BC+	AC BC CC+ DC+	CC DC AD+ BD+	AD BD CD+ DD+	CD DD

In addition, projects that achieve documented changes in environmental status during the project’s lifetime receive a positive impact rating, indicated by a “+”. The overall likelihood of achieving impacts is shown in Table 11 below (a + score above moves the double letter rating up one space in the 6-point scale).

The ROTI method provides a basis for comparisons across projects through application of a rating system that can indicate the expected impact. However it should be noted that whilst this will provide a relative scoring for all projects assessed, it does not imply that the results from projects can necessarily be aggregated. Nevertheless, since the approach yields greater clarity in the ‘results metrics’ for a project, opportunities where aggregation of project results might be possible can more readily be identified.

<b>Results rating of project entitled:</b>							
		<b>Rating (D – A)</b>		<b>Rating (D – A)</b>		<b>Rating (+)</b>	<b>Overall</b>
<b>Outputs</b>	<b>Outcomes</b>		<b>Intermediary</b>		<b>Impact (GEBs)</b>		
1.	1.		1.		1.		
2.	2.		2.		2.		
3.	3.		3.		3.		

	<b>Rating justification:</b>		<b>Rating justification:</b>		<b>Rating justification:</b>		

### Scoring Guidelines

The achievement of **Outputs** is largely assumed. Outputs are such concrete things as training courses held, numbers of persons trained, studies conducted, networks established, websites developed, and many others. Outputs reflect where and for what project funds were used. These were not rated: projects generally succeed in spending their funding.

**Outcomes**, on the other hand, are the first level of intended results stemming from the outputs. Not so much the number of persons trained; but how many persons who then demonstrated that they have gained the intended knowledge or skills. Not a study conducted; but one that could change the evolution or development of the project. Not so much a network of NGOs established; but that the network showed potential for functioning as intended. A sound outcome might be genuinely improved strategic planning in SLM stemming from workshops, training courses, and networking.

#### Examples

***Funds were spent, outputs were produced, but nothing in terms of outcomes was achieved.*** People attended training courses but there is no evidence of increased capacity. A website was developed, but no one used it. (Score – D)

***Outcomes achieved but are dead ends; no forward linkages to intermediary stages in the future.*** People attended training courses, increased their capacities, but all left for other jobs shortly after; or were not given opportunities to apply their new skills. A website was developed and was used, but achieved little or nothing of what was intended because users had no resources or incentives to apply the tools and methods proposed on the website in their job. (Score – C)

***Outcomes plus implicit linkages forward.*** Outcomes achieved and have *implicit forward linkages* to intermediary stages and impacts. Collaboration as evidenced by meetings and decisions made among a loose network is documented that should lead to better planning. Improved capacity is in place and should lead to desired intermediate outcomes. Providing implicit linkages to intermediary stages is probably the most common case when outcomes have been achieved. (Score - B)

***Outcomes plus explicit linkages forward.*** Outcomes have *definite and explicit forward linkages* to intermediary stages and impacts. An alternative energy project may result in solar panels installed that reduced reliance on local wood fuels, with the outcome quantified in terms of reduced C emissions. Explicit forward linkages are easy to recognize in being concrete, but are relatively uncommon. (Score A)

#### Intermediary stages:

The **intermediate stage** indicates achievements that lead to Global Environmental Benefits, especially if the potential for scaling up is established.

***“Outcomes” scored C or D.*** If the outcomes above scored C or D, there is no need to continue forward to score intermediate stages given that achievement of such is then not possible.

***In spite of outcomes and implicit linkages, and follow-up actions, the project dead-ends.*** Although outcomes achieved have *implicit forward linkages* to intermediary stages and impacts, the project dead-ends. Outcomes turn out to be insufficient to move the project towards intermediate stages and to the eventual achievement of GEBs. Collaboration as evidenced by meetings and among participants in a network never progresses further. The implicit linkage based on follow-up never materializes. Although outcomes involve, for example, further participation and discussion, such actions do not take the project forward towards intended intermediate impacts. People have fun getting together and talking more, but nothing, based on the implicit forwards linkages, actually eventuates. **(Score = D)**

***The measures designed to move towards intermediate states have started, but have not produced result, barriers and/or unmet assumptions may still exist.*** In spite of sound outputs and in spite of explicit forward linkages, there is limited possibility of intermediary stage achievement due to barriers not removed or unmet assumptions. This may be the fate of several policy related, capacity building, and networking projects: people work together, but fail to develop a way forward towards concrete results, or fail to successfully address inherent barriers. The project may increase ground cover and or carbon stocks, may reduce grazing or GHG emissions; and may have project level recommendations regarding scaling up; but barrier removal or the addressing of fatal assumptions means that scaling up remains limited and unlikely to be achieved at larger scales. Barriers can be policy and institutional limitations; (mis-) assumptions may have to do with markets or public – private sector relationships. **(Score = C)**

***Barriers and assumptions are successfully addressed.*** Intermediary stage(s) planned or conceived have feasible direct and explicit forward linkages to impact achievement; barriers and assumptions are successfully addressed. The project achieves measurable intermediate impacts, and works to scale up and out, but falls well short of scaling up to global levels such that achievement of GEBs still lies in doubt. **(Score = B)**

***Scaling up and out over time is possible.*** Measurable intermediary stage impacts achieved, scaling up to global levels and the achievement of GEBs appears to be well in reach over time. **(Score = A)**

**Impact:** Actual changes in environmental status

**“Intermediary stages” scored B to A.**

**Measurable impacts achieved at a globally significant level within the project life-span. . (Score = ‘+’)**



## Annex 9. Template for the assessment of the Quality of Project Design – UNEP Evaluation Office September 2011

Relevance	Evaluation Comments	Prodoc reference
Are the intended results likely to contribute to UNEPs Expected Accomplishments and programmatic objectives?		
Does the project form a coherent part of a UNEP-approved programme framework?		
Is there complementarity with other UNEP projects, planned and ongoing, including those implemented under the GEF?		
Are the project's objectives and implementation strategies consistent with:	i) Sub-regional environmental issues and needs?	
	ii) the UNEP mandate and policies at the time of design and implementation?	
	iii) the relevant GEF focal areas, strategic priorities and operational programme(s)? (if appropriate)	
	iv) Stakeholder priorities and needs?	
<b>Overall rating for Relevance</b>		
<b>Intended Results and Causality</b>		
Are the objectives realistic?		
Are the causal pathways from project outputs [goods and services] through outcomes [changes in stakeholder behaviour] towards impacts clearly and convincingly described? Is there a clearly presented Theory of Change or intervention logic for the project?		
Is the timeframe realistic? What is the likelihood that the anticipated project outcomes can be achieved within the stated duration of the project?		
Are the activities designed within the project likely to produce their intended results		
Are activities appropriate to produce outputs?		
Are activities appropriate to drive change along the intended causal pathway(s)		
Are impact drivers, assumptions and the roles and capacities of key actors and stakeholders clearly described for each key causal pathway?		
<b>Overall rating for Intended Results and causality</b>		
<b>Efficiency</b>		
Are any cost- or time-saving measures proposed to bring the project to a successful conclusion within its programmed budget and timeframe?		
Does the project intend to make use of / build upon pre-existing institutions, agreements and partnerships, data sources, synergies and complementarities with other initiatives, programmes and projects etc. to increase project efficiency?		
<b>Overall rating for Efficiency</b>		
<b>Sustainability / Replication and Catalytic effects</b>		
Does the project design present a strategy / approach to		

sustaining outcomes / benefits?			
Does the design identify the social or political factors that may influence positively or negatively the sustenance of project results and progress towards impacts? Does the design foresee sufficient activities to promote government and stakeholder awareness, interests, commitment and incentives to execute, enforce and pursue the programmes, plans, agreements, monitoring systems etc. prepared and agreed upon under the project?			
If funding is required to sustain project outcomes and benefits, does the design propose adequate measures / mechanisms to secure this funding?			
Are there any financial risks that may jeopardize sustenance of project results and onward progress towards impact?			
Does the project design adequately describe the institutional frameworks, governance structures and processes, policies, sub-regional agreements, legal and accountability frameworks etc. required to sustain project results?			
Does the project design identify environmental factors, positive or negative, that can influence the future flow of project benefits? Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits?			
Does the project design foresee adequate measures to catalyze behavioural changes in terms of use and application by the relevant stakeholders of (e.g.):	i) technologies and approaches show-cased by the demonstration projects;		
	ii) strategic programmes and plans developed		
	iii) assessment, monitoring and management systems established at a national and sub-regional level		
Does the project design foresee adequate measures to contribute to institutional changes? [An important aspect of the catalytic role of the project is its contribution to institutional uptake or mainstreaming of project-piloted approaches in any regional or national demonstration projects]			
Does the project design foresee adequate measures to contribute to policy changes (on paper and in implementation of policy)?			
Does the project design foresee adequate measures to contribute to sustain follow-on financing (catalytic financing) from Governments, the GEF or other donors?			
Does the project design foresee adequate measures to create opportunities for particular individuals or institutions ("champions") to catalyze change (without which the project would not achieve all of its results)?			
Are the planned activities likely to generate the level of ownership by the main national and regional stakeholders necessary to allow for the project results to be sustained?			
<b>Overall rating for Sustainability / Replication and Catalytic effects</b>			
Risk identification and Social Safeguards			
Are critical risks appropriately addressed?			

Are assumptions properly specified as factors affecting achievement of project results that are beyond the control of the project?		
Are potentially negative environmental, economic and social impacts of projects identified?		
<b>Overall rating for Risk identification and Social Safeguards</b>		
<b>Governance and Supervision Arrangements</b>		
Is the project governance model comprehensive, clear and appropriate?		
Are roles and responsibilities clearly defined?		
Are supervision / oversight arrangements clear and appropriate?		
<b>Overall rating for Governance and Supervision Arrangements</b>		
<b>Management, Execution and Partnership Arrangements</b>		
Have the capacities of partner been adequately assessed?		
Are the execution arrangements clear?		
Are the roles and responsibilities of internal and external partners properly specified?		
<b>Overall rating for Management, Execution and Partnership Arrangements</b>		
<b>Financial Planning / budgeting</b>		
Are there any obvious deficiencies in the budgets / financial planning		
Cost effectiveness of proposed resource utilization as described in project budgets and viability in respect of resource mobilization potential		
Financial and administrative arrangements including flows of funds are clearly described		
<b>Overall rating for Financial Planning / budgeting</b>		
<b>Monitoring</b>		
Does the logical framework: <ul style="list-style-type: none"> <li>capture the key elements in the Theory of Change for the project?</li> <li>have 'SMART' indicators for outcomes and objectives?</li> <li>have appropriate 'means of verification'</li> <li>adequately identify assumptions</li> </ul>		
Are the milestones and performance indicators appropriate and sufficient to foster management towards outcomes and higher level objectives?		
Is there baseline information in relation to key performance indicators?		
Has the method for the baseline data collection been explained?		
Has the desired level of achievement (targets) been specified for indicators of Outcomes and are targets based on a reasoned estimate of baseline??		
Has the time frame for monitoring activities been specified?		
Are the organisational arrangements for project level progress monitoring clearly specified		
Has a budget been allocated for monitoring project progress in implementation against outputs and outcomes?		
Overall, is the approach to monitoring progress and performance		

within the project adequate?		
<b>Overall rating for Monitoring</b>		
<b>Evaluation</b>		
Is there an adequate plan for evaluation?		
Has the time frame for Evaluation activities been specified?		
Is there an explicit budget provision for mid term review and terminal evaluation?		
Is the budget sufficient?		
<b>Overall rating for Evaluation</b>		