PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: FULL SIZE PROJECT
THE GEF TRUST FUND

Submission Date: 11 March 2009
Re-submission Date: 23 December 2009

PART I: PROJECT IDENTIFICATION

GEFSEC PROJECT ID[1]:
GEF AGENCY PROJECT ID:
COUNTRY(IES): Global
PROJECT TITLE: Global foundations for reducing nutrient enrichment and oxygen depletion from land-based pollution, in support of Global Nutrient Cycle.
GEF AGENCY(IES): UNEP, (select), (select)
OTHER EXECUTING PARTNER(S): UNEP/GPA, UNESCO
GEF FOCAL AREA (S): International Waters,(select), (select)
GEF-4 STRATEGIC PROGRAM(S): IW-SP2
NAME OF PARENT PROGRAM/UMBRELLA PROJECT:

INDICATIVE CALENDAR	
Milestones	**Expected Dates**
Work Program (for FSP)	March 2010
CEO Endorsement/Approval	December 2010
GEF Agency Approval	March 2011
Implementation Start	May 2011
Mid-term Review (if planned)	April 2013
Implementation Completion	April 2015

A. PROJECT FRAMEWORK (Expand table as necessary)

Project Objective: To provide the foundations (including partnerships, information tools and policy mechanisms) for governments and other stakeholders to initiate comprehensive, effective and sustained programmes addressing nutrient over-enrichment and oxygen depletion from land-based pollution of coastal waters in Large Marine Ecosystems.

Project Components	Investment, TA, or STA**	Expected Outcomes	Expected Outputs	Indicative GEF Financing*		Indicative Co-financing*		Total ($)
				($) *100	%	($) *100	%	
A.Fully established Global Partnership for Nutrient Management, addressing nutrient over-enrichment of coastal zones, its causes and resulting eutrophication and dead zones in LMEs ***Outputs (i)-(v) and (vii) and (viii) developed in context of GPNM (and its use as catalyst) over first year of project*** ***Output (vi): guidelines to be developed in context of PPG and first 3 months of project to provide umbrella and impetus for more specific tools and analysis under other components.*** ***These tools and analysis developed over first 12-18 months of project (see below)*** ***Output (ix) global partnership will facilitate opportunities for replication and up-scaling of good practice from current GEF***	STA	Global partnership of stakeholders involved in addressing nutrient over - enrichment in coastal waters GEF projects, countries and relevant stakeholders have access to continued guidance and support for development and implementation of nutrient reduction strategies Community of Practice on nutrient management targeting GEF-funded and other projects GEF projects, countries and relevant stakeholders are better informed about the importance of land-based and sea-based causes and impacts of nutrient over-enrichment and resulting eutrophication and dead zones in LMEs, including their environmental and economic costs Support of outcomes of the 3rd Intergovernmental Review of GPA	(i)Stakeholder involvement and establishment of a Global Partnership for Nutrient Management reducing nutrient enrichment aimed at addressing global nitrogen cycle disruption (ii)Web-based platform targeting GEF nutrient-related projects, countries and other stakeholders to facilitate the continued learning, exchange and guidance for the reduction of nutrient over-enrichment and oxygen depletion in LMEs (iii)Website as part of the IW:LEARN workspace with tools & guidelines in order to facilitate mutual learning and information exchange amongst GEF International Waters (IW) projects (iv)Global overview of nutrient over-enrichment of coastal zones, its causes sources and resulting eutrophication and dead zones in LMEs (v)Synthesis report identifying emerging issues and knowledge gaps, with particular focus on environmental and economic costs (vi)Guidelines, tools and data for nutrient source-impact analysis developed under components B, as well as the policy toolbox developed under component C, shared with GEF projects and other potential users in follow-up to the GEF 2009 'Dead Zone' work. (vii)The establishment of a fully-functioning Community of Practice targeting GEF nutrient-related projects with catalytic links to UNEP GPA and Regional Seas Programmes (viii)Active participation in portfolio	330,000	49	350,000	51	680,000

[1] Project ID number will be assigned initially by GEFSEC.

projects over first year of project. Replication and upscaling of tools and analysis deriving from project under components B and C will be developed during second 18 months of the project.			learning for GEF projects, including contributions to the innovation market place exhibition, experience notes and at least one workshop organized at the biennial international water conferences (allocation of 1% of the GEF budget) (ix)Replication and up-scaling of good practices and lessons learnt					
B. Quantitative analysis of relationships between nutrient sources and impacts, as basis and tool to guide decision-making on policy and technological options ***Outputs (i) overview and (ii)global data base development to take place during first year of project as part of baseline development and strengthening*** ***Output s(iv)and (v) actual modeling, predictive capacity, development of regional models and training to take place in second and third years of project*** ***Output (vi) initial guidelines developed as umbrella during PPG and first 3 months of project. Fully developed user manuals for integrated assessment and use developed after (iv) and in tandem with policy tool box and testing***	STA	Relevant stakeholders in developed and developing countries have a basis and tools available to: attribute sources of nitrogen (N), phosphorus (P) and silica (Si) within watersheds; quantify past, current and potential future export of N, P and Si to the coastal zone; and develop estimates of the relative effectiveness of increases or decreases in nutrient export on coastal water quality at regional to international scales	(i)Overview of existing tools for source-impact analysis of nutrients in LMEs and their target audiences (ii)Global database development with documentation of data on nutrient loading and occurrence of harmful algal blooms, hypoxia, and effects on fish landings, fish abundance, and composition of fish populations (iii)Global database development with data on coastal conditions, land based and sea based nutrient sources, as well as coastal effects collected from existing sources (iv)Nutrient impact modeling for global and local to regional nutrient source impact analysis , which enables improved: - predictive capability of nutrient sources and loads - assessment of effects of nutrient loading in coastal marine ecosystems - analysis of past, current and future contributions of different nutrient sources, forms and ratios in watersheds to coastal effects, and - development of regional models and maps of coastal effects and nutrient assimilative capacity under different physical regimes using regional data (v) Regional and national scientists and policy experts, particularly from developing countries, trained in using nutrient source-impact modeling and analysis (vi)Nutrient source-impact guidelines and user manuals for integrated eutrophication assessment and nutrient criteria development	550,000	49	580,000	51	1,130,000
C. Scientific, technological and policy options to improve coastal water quality policies in LMEs and national strategy development ***Output s(i)-(iii) to be conducted over first 12 months of project as part of establishing policy options etc baseline on which more refined and integrated tool box will be developed*** ***Output (iv) developmental over first 18months of project to reflect currently available***	STA/ TA	Decision-makers have access to tools to develop cost-effective policy, and use market based instruments and financial mechanisms to effectively reduce nutrient over-enrichment in LMEs Web-based forum for the broad exchange and continual updating of the data, analysis, guidelines, case studies, scientific, technological and policy options to facilitate up-scaling of good practices Multi-stakeholder dialogue on appropriate regional and/or global frameworks – including input to the 3r Intergovernmental Review of the GPA	(i)Global overview of technological and policy options and tools (including multilateral instruments) to reduce nutrient over-enrichment in large marine ecosystems (ii)In-depth case studies of selected technology and policy options, including an analysis of factors of cost effectiveness, success and/or failure to reduce nutrients and their effects (iii)Synthesis report providing a review of regulations, policies and specific measures to decrease nutrient inputs to, or cycling in, watersheds (iv)Policy Toolbox containing detailed summaries of policy options and technology measures to decrease nutrient inputs and their specific characteristics (achievements, costs, socio-economic impacts, infrastructure required, etc.) (v)Integration of outputs of source-impact analyses, including guidelines	350,000	48	380,000	52	730,000

options, second phase at output (v) ***Output (v) to be carried out in years two and three of project as outputs from components A and B emerge and testing is carried out under D.*** ***Outputs (vi) and (vii) timing in part contingent on output (v) above, and will be co-ordinated with work under D.***			(from component B) into the Policy Toolbox to support cost- and environmentally-sound decision-making (vi)Training materials on the use of the Policy Toolbox in developing strategies and implementation plans for nutrient reduction (vii)Regional and national scientists and policy experts, particularly from developing countries, trained in using the nutrient Policy Toolbox					
D. Pilot testing of the use of the Policy Toolbox in the development of nutrient reduction strategies* ***Outputs (i)-(iii) to be carried out in first 18 months of project to establish baseline for region and build regional partnership linked to global one at A.*** ***Outputs (iv) –(vi): Timing dependent on development of database (likely 18-24 months of project) at (vi)*** ***Outputs (vii) and (viii) culmination of project and will be completed in last 6 months of project***	TA	Strengthened partnership and information for decision-making on cost effective nutrient reduction measures to improve coastal water quality and monitor their effectiveness over time National, local and regional institutional and regulatory reform plans to reduce nutrient loading from land based pollution of coastal waters Agreements with different stakeholders on nutrient reduction strategies to be implemented Potential for up-scaling of guidelines and tools assessed	(i)Stakeholder analysis and needs assessment of the target audience conducted in the selected demonstration region (ii)Nutrient reduction partnership established for the demonstration region with virtual representation in the IW Learn / communities of practice for GEF projects (iii) Establishment of a database with baseline data and indicators on nutrient sources and impacts in associated coastal ecosystems, nutrient status, policies and regulations for the demonstration region (iv) Hands-on training workshops for GEF project partners, scientists and policy specialists from demonstration region. (v)Pilot testing of the information tools and mechanisms developing a nutrient reduction plan or strategy in the demonstration region (vi)Databases covering different levels of spatial and temporal resolution, and more detailed local data on sources for the demonstration region (vii)Nutrient reduction plan for demonstration region based on national priorities, source-impact analysis and application of the Policy Toolbox in strategy development and partnership building (viii)Evaluation of lessons learned during the pilot testing of the policy tool box, and recommendations for further up-scaling of tools and approaches	318,182	44	400,000	56	718,182
4. Project management				170,000	47	190,000	53	360,000
Total project costs				1,718,182	47	1,900,000	53	3,618,182

* List the $ by project components. The percentage is the share of GEF and Co-financing respectively to the total amount for the component.
** TA = Technical Assistance; STA = Scientific & technical analysis.

B. INDICATIVE FINANCING PLAN SUMMARY FOR THE PROJECT ($)

	Project Preparation*	Project	Agency Fee	Total
GEF		1,718,182	171,818	1,890,000
Co-financing		1,900,000		1,900,000
Total	**PPG will be requested in a separate PPG request form.**	**3,618,182**	**171,818**	**3,790,000**

* Suggested key indicator: Number of governments, private sector stakeholders, policy makers, regional organizations and NGOs who incorporate nutrient reduction strategies and measures into national and sectoral policy making and plans consistent with GPA

* Please include the previously approved PDFs and planned request for new PPG, if any. Indicate the amount already approved as footnote here and if the GEF funding is from GEF-3.

C. INDICATIVE CO-FINANCING FOR THE PROJECT (including project preparation amount) **BY SOURCE and BY NAME (**in parenthesis) if available, **($)**

Sources of Co-financing	Type of Co-financing	Amount
Project Government Contribution	Unknown at this stage	0
GEF Agency(ies)	In-kind	500,000
Bilateral Aid Agency(ies)	Unknown at this stage	400,000
Multilateral Agency(ies)	Cash and In-Kind	450,000
Private Sector	In-kind	100,000
NGO	Unknown at this stage	100,000
Others	Unknown at this stage	350,000
Total co-financing		**1,900,000**

D. GEF RESOURCES REQUESTED BY FOCAL AREA(S), AGENCY (IES) SHARE AND COUNTRY(IES)

GEF Agency	Focal Area	Country Name/ Global	(in $)			
			Project Preparation	Project	Agency Fee	Total
UNEP	International Waters	Global	PPG request will be sent separately.	1,718,182	171,818	1,890,000
Total GEF Resources				**1,718,182**	**171,818**	**1,890,000**

PART II: PROJECT JUSTIFICATION

A. STATE THE ISSUE, HOW THE PROJECT SEEKS TO ADDRESS IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED:

THE ISSUE (*INCLUDING CURRENT BASELINE OF INFORMATION AND APPROACHES*)

The environmental stability of the last 10,000 may be under threat where human actions have now become the main driver of global environmental change. This could see human activities push the Earth system outside the stable environmental state of the Holocene, with consequences that are detrimental or even catastrophic for large parts of the world (Rockström et el, 2009)[2].

Nutrient over-enrichment of coastal waters in Large Marine Ecosystems (LMEs) is an increasing problem worldwide. It has been estimated that the global load of nitrogen to the coastal zone increased three fold between the 1970s and 1990s[3] and is expected to continue to rise[4]. In coastal waters, increased nutrients such as nitrogen and phosphorus can cause phytoplankton and macro algae blooms, a process known as eutrophication. Eutrophication can lead to the occurrence of harmful algal blooms, and oxygen depletion (hypoxia) or 'dead' zones. Harmful algal blooms are often toxic with effects ranging from neurotoxic, diarhheic, paralytic shellfish poisoning and cyanotoxic algal blooms. Hypoxia is caused when algae die, sink to the bottom and are digested by bacteria, in the process using up the available dissolved oxygen. Since 1960, the number of documented hypoxic areas has doubled every decade such that by 2007 there were at least 182 systems identified around the world as hypoxic. [5]

There are many additional effects of eutrophication including the loss of subaquatic vegetation, nuisance or toxic algae that can lead to fish kills and shellfish poisoning in humans, coral reef degradation, and loss of species diversity among others, reducing the resilience of coastal systems to climate change. Globally, harmful algae blooms are considerably more widespread and frequent than they were a decade ago, a situation that is expected to further deteriorate by 2020.[6] Indeed, the fourth UNEP Global Environment Outlook report (GEO-4) warns that a number of environmental thresholds have been reached due to sustained human activities including collapse of fisheries, eutrophication and deprivation of oxygen in aquatic systems. While the effects of eutrophication have been

[2] Rockstöm, J. et al, 2009: "Planetary Boundaries: "Exploring the Safe Operating Space for Humanity" .
[3] UNEP/GEF/LOICZ The role of the coastal ocean in the disturbed and undisturbed nutrient and carbon cycles (2006).
[4] UNEP/GPA State of the Marine Environment (2006).
[5] WRI Eutrophication: an overview of status, trends, policies and strategies (in print).
[6] GIWA Challenges to International Waters Regional Assessments in a Global Perspective (2006).

documented in many areas around the world, there are many more areas for which data have not been compiled or do not exist. In particular there is a need for additional information in Asia, Africa, Latin America and the Caribbean.

Land-based activities are the dominant source of nutrients and these can enter coastal ecosystems through different pathways including air, surface water and groundwater. Key sources of anthropogenic nutrients include: agriculture - in particular through fertilizer leaching from agricultural fields, manure from concentrated livestock operations and aquaculture -, wastewater discharge from sewage and industry, fossil fuel emissions and atmospheric deposition from land based sources. Biological N_2-fixation (both natural and from agriculture) is also an important nitrogen source.

Today, the food security of two-thirds of the world's population depends on fertilizers, particularly nitrogen fertilizer.[7] Between 1960 and 1990, global use of synthetic nitrogen fertilizer increased more than sevenfold, while phosphorus use more than tripled.[4] In practice, chemical fertilizers are often over-applied, or applied at a time when they cannot be effectively utilized by crops.[3] As a result, as much as 20% of nitrogen fertilizer is lost through surface runoff or leaching into the groundwater.[4] Phosphorus binds to the soil and can be lost through soil erosion on agricultural lands. Intensive livestock breeding in concentrated areas has also contributed to increases in nutrient releases to the environment through manure production and application resulting in nitrate losses to groundwater and ammonia emissions to the atmosphere[6]. Some of the root causes of excessive releases of nutrients from agriculture can be linked to lack of awareness and training of farmers on the use and negative impacts of over-fertilization.[4]

Considered point sources of pollution, urban and industrial sources of nutrient releases to coastal waters are often the most controllable. The contribution to nutrient loading of coastal waters from human wastewater varies considerably and is generally more important as a source of phosphorus than of nitrogen[7]. Some of the underlying root causes of eutrophication from urban sewage are due to limited funding for treatment infrastructure and a lack of incentives to operate existing infrastructure.[4] The burning of fossil fuels, in particular from coal-fired power plants and exhaust from cars, buses and trucks, releases nitrogen oxides into the atmosphere. It is estimated that fossil fuel combustion contributes 22 Tg of nitrogen to the global environment every year, which is approximately 20% of the contribution of synthetic nitrogen fertilizers.[3]

The nitrogen cycle is changing faster than that of any other element.[3] The scale of reactive nitrogen is significant with annual inputs of reactive nitrogen from agricultural, industrial and transportation sources increasing by more than a factor ten in the last 150 years and now exceeding the annual rate of production from natural sources. In addition, the effects of reactive nitrogen are not limited to a single medium such as coastal waters. Known as the 'nitrogen cascade', a single molecule of reactive nitrogen may transition through many forms - ammonia, nitrogen oxide, nitric acid, nitrate and organic nitrogen – and may successively lead to a number of environmental, health and social impacts, including contributing to higher levels of ozone in the lower atmosphere.[6] The economic cost of these impacts is great, although assessments are limited. The United States Environment Protection Agency estimates the net benefits of the Clean Air Act Amendments of 1990 at $690 billion for the period 1990-2010, and a study conducted by the Ontario Medical Association (Canada) found that air pollution, due to excess reactive nitrogen and other pollutants, cost Ontario citizens more than $1 billion per year in hospital admissions. Such assessments are needed in all countries.

Over the last decade a number of global, regional and national initiatives have identified and addressed the issue of nutrient enrichment to the coastal zone. These include global assessments such as the Global International Waters Assessment (GIWA), TDA/SAP processes of GEF projects and work done by the IGBP core project on Land-Ocean Interactions in the Coastal Zone (LOICZ). Additionally, the availability of environmental data is rapidly escalating through global databases such as the Global Ocean Observing System (GOOS). This suite of observations is developing to provide a vast resource of the physical, environmental and biological data. This resource is beginning to be applied in the interpretation of conditions that may accompany, or inhibit specific eutrophication effects, such as the development of specific toxic species. At the same, there is recognition that effective solutions, which might be common in overall approach and methods, will need to recognize that watersheds and coastal systems vary as do the capacities, interests and priorities among end users. One template will not fit all and countries must therefore tailor their respective approaches to nutrient management.

Global, spatially explicit models of nutrient loading from watersheds are now available along with a better understanding (and better observation methods) of coastal dynamics and the expansion of global data bases on coastal biomass. Building on regional and other initiatives, eg the Danube, OSPAR and HELCOM, we are moving to a position where we can better link patterns of eutrophication with coastal effects from around the world in a more rigorous and quantitative way. Notwithstanding advances made in modeling approaches, there remains a lack of knowledge on the quantitative relationships between nutrient sources and controlling factors in watersheds and effects

[7] UNEP/WHRC Reactive Nitrogen in the Environment: too much or too little of a good thing (2006)

on coastal ecosystems. Without this knowledge, consistent databases and coherent information on tools and approaches, the development of genuinely cost effective policy measures are unlikely to be achieved.

Without better knowledge and improved policy responses, eutrophication of estuaries and coastal waters is likely to intensify in many regions in response to the increased application of fertilizers, especially in Asia and Africa. It will also increase in prevalence due to increase in food and animal production, growth in the aquaculture industry, increasing quantities of human sewage, generation of nitrogen from fossil fuel combustion and potentially as a result of global warming. Consistent with moves towards enhanced food security, there is a pressing need to build a stronger science base, integrated management approaches and partnerships in relation to nutrients. Reflecting these trends and needs, and the gaps identified above, UNEP/DTIE and UNEP/GPA commissioned a report from INI 'What we know and what can be done: an assessment of nitrogen in coastal areas across the globe' in order to establish a basis among leading scientists as to where the issues currently stand. This followed earlier interactions between DTIE and leading scientific institutions to develop a shared understanding.

HOW THE PROJECT SEEKS TO ADDRESS ISSUE:

While there is a substantial volume of information on nutrient sources and coastal impacts, the landscape of nutrient initiatives, management approaches and information is dispersed and fragmented and there is little in terms of a systematic approach to information use and which management approaches work and why. Furthermore, there is presently no multilateral framework directly addressing nutrient over enrichment at global or regional scales. At the same time, given the variety of nutrient sources and impacts, there is a need for more consistent databases and the integration of knowledge and data on the impacts of nutrient loading in coastal marine ecosystems (notably re harrmful algal blooms, hypoxia, and effects on fisheries and coral reefs) particularly in developing countries, for managers and policy makers of national governments and regional organizations. The lack of an overview of available tools and information was identified as a key barrier to effective nutrient management in the most recent Intergovernmental Review of the GPA. Moving towards a appropriate responses for nutrients management, at varying scales, will be a key focus of the next Intergovernmental Review.

Accordingly, this project will provide the foundations for local, national, regional and global approaches to nutrient management and the prevention of nutrient over-enrichment. These foundations will help in the run up to the 3rd GPA meeting to inform government on nutrient issues. The project will reflect the reality that watersheds and coastal systems vary around the world, as do particular country priorities, and that policy and technological solutions need to be tailored and adapted by countries to conditions at appropriate management levels. It is in this regard the project makes a real, added value contribution, taking the newly available global models and approaches, presenting and developing them within the context of a global partnership, but testing and demonstrating their relevance at more specific levels to facilitate actual integrated management. In order to ground this work effectively and reflect national and local circumstances, the project first establishes information and policy baselines derived from experiences with projects and initiatives. A globally relevant policy and tool box will then be available in modular form, which can then be used in the light of particular needs and circumstances. How the models need to be tailored etc will be reinforced from the pilot testing approach, so refining the overall package of measures to help integrated management.

The project takes a logical approach in addressing the current position and what needs to be done. It identifies a number of components with specific outputs and indicative timings for carrying out the work. A feature is that some of the work under the different components will be carried out in parallel, often in the first period of the project as part of establishing a coherent foundation (including stakeholder engagement in the pilot region) from which further analytical work, training and engagement is required.

Within the framework of the UNEP supported Global Partnership on Nutrient Management launched in April 2009, the project commences by building a partnership for, *inter alia*, GEF nutrient projects and clearly identifying and addressing information gaps with the aim to avoid harmful run-off effects into watersheds and marine areas, and facilitating necessary investments in nutrient management. An increasing number of GEF projects focus on nutrient-related issues, and GEF projects and partners would benefit from consolidated nutrient information, bringing together the outcomes of assessments, modeling approaches and practical experiences, and increasing the availability of information and tools to a greater number of stakeholders. There is no single place for GEF projects or countries where an overview of available information tools and mechanisms can be found to develop nutrient reduction strategies, whether at local, national, regional or global scales. However, the Global Partnership does harness existing initiatives like INI and SCOPE LOIC" to help bring the issue to the attention of government agencies to strengthen inter-governmental processes.

The project will assist GEF projects, countries and relevant stakeholders to ensure that global, regional and national policy, legislative and institutional reforms are developed and implemented in the most cost-effective manner for the sustainable reduction of nutrient over-enrichment and oxygen depletion in LMEs. Through the exchange of information, guidelines, lessons learned and best practices, the project will develop and provide countries with a mechanism to assess risks and identify most cost-effective policy and technological options based on socio-economic optimization tools, and assist in developing and up-scaling of financial mechanisms for the implementation of nutrient reduction strategies and agreements, including agreements for public/private partnerships. The GPNM inter alia will host the web-based platform for the project, facilitating the exchange of information, best practices and lessons learned with non-GEF partners.

The next stage (component B), after establishing an information and policy baseline focuses on developing the more *quantitative* integrated approaches that are needed to develop effective and economically-wise nutrient reduction policies to control coastal eutrophication. These quantitative approaches can be used to evaluate the potential effect on coastal ecosystems of *future* human impacts resulting from different development strategies on different scales ranging from local to global. The difference with existing assessments is the integrated approach, combining the impacts of population growth, urbanization, development of sewage systems, wastewater treatment and sewage effluent, atmospheric nitrogen deposition, water engineering, including dam construction for irrigation and hydropower, climate change, agricultural production and food security, land cover change, bio-fuel production, aquaculture, agricultural nutrient management and land degradation. Integrating all that information in meta-models at different scales (continental, regional or LME – see component B) will then form the basis for development and use of a Policy Toolbox (see component C) to enable policy makers to assess risks, identify cost-effective policy and technology options, develop action plans for regional nutrient reduction and soil conservation, and further development of financial mechanisms for the implementation of those plans. Training packages for stakeholders and further dissemination would be instigated under component C as the Policy Toolbox is developed. Full testing and piloting of the Policy Toolbox, in the context of the development of countries' nutrient reduction strategies, will take place in a demonstration region (component D). The analysis and results of the testing, including potential for up-scaling of the various tools and approaches, will also be made available outside the region. Linkage of the various components in this way has the benefit of strong information, policy development and implementation feedback as the project is taken forward.

Component A. Global Partnership for Nutrient Management addressing nutrient over-enrichment of coastal zones, its causes and resulting eutrophication and dead zones in LMEs

An increasing number of GEF projects are trying to address nutrient over-enrichment and oxygen depletion in coastal and marine ecosystems. Although each project takes a different approach towards the issue, common areas of work can be identified based on, for example, nutrient sources (e.g. livestock) or technological measures to prevent over-enrichment (e.g. constructed wetlands). The Scientific and Technical Advisory Panel of the GEF (STAP) has also has identified nutrient enrichments as one of the key issues for its programme of work. Although in the past projects exchanged information and lessons on an *ad hoc* basis (e.g. scientific and technical workshops at biennial portfolio learning meetings), there is a need for more regular, sustained interaction and guidance on nutrient over-enrichment of coastal waters in LMEs.

The Global Partnership for Nutrient Management – which addresses nutrient over-enrichment of coastal zones, its causes and resulting eutrophication and dead zones – under component A of this project will specifically target GEF projects and portfolio learning. Key partners, such as IOC, INI and LOIC2 are invited to join this partnership. Because component A will be supportive of the other components B, C and D, the component will be developed in parallel with these other elements. A project website will be developed and linked to the GEF International Waters Learning and Exchange Resource Network (IW:LEARN) as well as related partner sites, in order to optimally benefit from UNEP/GPA and UNESCO nutrient reduction training activities and resources. Project partners will be encouraged to pro-actively participate and contribute to GEF portfolio wide dialogues and mutual learning activities of IW:LEARN.

The global overview of nutrient over-enrichment will focus on synthesizing knowledge and addressing knowledge gaps, with specific emphasis on the economic and environmental costs of nutrient over-enrichment and oxygen depletion. The synthesis reports will build upon existing and emerging knowledge by integrating the information developed in the recent INI UNEP nutrient assessment[8], the WRI report[5], the work of STAP in 2009, the UNESCO global NEWS project, the working group on Harmful Algal Blooms and other relevant Agency projects and programmes, and include results from Transboundary Diagnostic Analyses (TDAs) and Strategic Action Plans (SAPs) developed for many LMEs with GEF funding. Furthermore, considerable effort will be invested in compiling

[8] Draft UNEP/DTIE, INI, What we know & what can be done: an assessment of nitrogen in coastal zones across the globe

additional information from published reports and peer-reviewed journals, and where feasible, from local data sources, particularly for LMEs in developing regions and economies in transition.

From the beginning, partnerships beyond GEF projects will be facilitated by UNEP/GPA, as well as other programmes, to assist with local data access and interpretation as well as engagement in the larger goal of the project, namely to achieve a reduction in the effects of nutrient enrichment in LMEs in terms of harmful algal blooms, hypoxia, degradation of coral reefs, and harm to fisheries. Overall this component will broker knowledge for stakeholders so that they are better informed about the impacts and causes of nutrient over-enrichment of coastal zones and resulting eutrophication and dead zones in LMEs, including the associated environmental costs.

The web-based platform will be a critical interface for the project to interact with GEF projects and other stakeholders. Initially, it will provide a synthesis of existing knowledge on nutrient sources, coastal impacts, and policies, and a mechanism for developing strategies to address nutrient enrichment and oxygen depletion in LMEs. As the project develops, the platform will become the repository for the databases needed for the quantitative analysis of relationships between nutrient sources and impacts (see component B). Wherever possible, component A will use information generated in other activities such as LOICZ.

Once the outputs from the nutrient source-impact analyses (component B) and the Policy Toolbox (component C) have been developed (incorporating outputs from B) , they will be hosted on the platform and shared with the global partnership. The platform will be a key resource where information is compiled and made available on major land-based and aquaculture emission sources and impacts, cross-media transfer of nutrients, environmental costs, outcomes of policies and measures applied to reduce emissions and impacts, and identification and analysis of impacts in LMEs. In so doing, it will also provide a user friendly interface for the application and use of information tools and mechanisms developed under B and C.

Component B. Quantitative integrated model analysis of relationships between nutrient sources and impacts as a basis and tool for developing policy and technological options

Component B addresses the need for more quantitative nutrient analysis, particularly in developing countries, and the exchange of information on this. In an innovative way, the component aims at improved predictive capability and use of tools, guidelines and modeling outputs by relevant stakeholders in order to attribute nutrient sources within watersheds and to quantitatively analyze relationships between nutrient sources and impacts. The model approach integrates detailed data and knowledge on the different nutrient and sediment sources (food production systems, sewage, industry, atmospheric N deposition, aquaculture) and the quantification of impacts in coastal ecosystems. This model approach can also be used to analyze the effects of future climate change on nutrient and carbon loads to, and impacts on, coastal ecosystems. Information will be compiled, making full use of existing knowledge, on major emissions sources and impacts, cross-media transfer of nutrients, outcomes of policies and measures applied to reduce emissions and impacts, and identification and analysis of impacts in LMEs. The impacts that will be considered include harmful algal blooms, hypoxia and effects on fisheries.

A community of model users will be developed within the partnership that use the models and modeling results to attribute sources of nitrogen (N), phosphorus (P) and silica (Si), and develop estimates of the relative effectiveness of possible policy decisions on coastal water quality at regional and international scales. To establish linkages between watershed nutrient sources, controlling factors, and nutrient loading, an established spatially-explicit watershed modeling system (IOC's NEWS) will be used. The strengths and feasibility of this system have been demonstrated in previous applications using global databases[9]. The application of the NEWS models in the current project will be significantly enhanced by compiling and applying local and higher resolution model input data. For this purpose the NEWS models may need to be modified to make it applicable to fine-resolution analyses, particularly for the demonstration site (see component D), using for example grid-scale application of the models including retention processes in rivers, lakes and reservoirs. Relationships between coastal nutrient loading and ecosystem response will be further developed and tested with a focus on developing countries[10].

Resulting benefits from the nutrient source-impact analyses under this component include: improved long-term data records of coastal environmental conditions; improved quantitative relationships between nutrient loads and effects; improved regional models of coastal effects under different physical regimes; better use of the outcomes of global, regional and local-scale models of nutrient loads and export; improved predictive capability; and guidelines for integrated eutrophication assessment and nutrient criteria development, policy and cost analysis.

[9] Seitzinger et al., 2005, Harrison et al., 2005a and b, Dumont et al., 2005, Beusen et al., 2005
[10] Beman et al., 2005, Nixon et al., 1992; Madden et al. in press; Billen and Garnier 2007; Scavia .....; Smith et al. 200x

Climate change effects on coastal ecosystems will be analyzed from a number of perspectives. Climate effects on river hydrology as it impacts nutrient loading and subsequent coastal ecosystem effects will be analyzed. Using ocean and coastal-scale biogeochemical models and satellite data, component B will also look into the possibility to analyze the impact of warming of sea-water temperatures on coastal ecosystems, and investigate the impact of changes in nutrient export to the coastal zone on the global carbon cycle.

Linking modeling results on nutrient loading and coastal effects with GEF interventions provide broad opportunities for mutual learning and up-scaling of results. Knowledge transfer and use of quantitative methodologies and results will be pursued by involving GEF projects, scientists and policy specialists in all components of the project. Training workshops will be developed for scientist, policy makers and other (industry) stakeholders on the use of the nutrient source-impact analyses. The web-based platform developed under component A will serve as a source of information on model implementation, input data and source-impact analysis results, and a forum for discussion among user groups and the wider partnership on up-scaling its use and findings.

Component C. Scientific, technological and policy options to improve coastal water quality policies in LMEs and national strategy development

During the last Intergovernmental Review of the GPA participating governments identified nutrient over-enrichment as a priority issue and committed themselves to devote additional effort, finance and support to address point and non-point source nutrients at national level. This includes municipal, industrial and agricultural wastewater, as major and increasing source categories directly affecting human health, well-being and the environment, including marine ecosystems and their associated watersheds. Component C will support a GPA Review Meeting which will provide inputs to government for the run up to the GPA's Inter-Governmental Review scheduled for 2011. Component C will also support national action and the development of nutrient plans and strategies by focusing on the application of existing knowledge and practices. Component C will result in a review meeting and in the identification of cost-effective and sustainable technology and policy options, which will be made available in form of a Policy Toolbox to inform and strengthen the development of nutrient strategies.

The difficulty with nutrient pollution is the multi-source, multi-component, multi-effect, multi-scale and multi-issue dimensions of the problems as outlined previously in this document. Therefore there is no simple policy or set of measures that can easily be implemented to reduce inputs and effects. A systematic approach is needed to collect the relevant data and then to use these with help of a Policy Toolbox to develop cost-effective policies and action plans (such as Strategic Action Plans (SAPs) developed for some LMEs).

The approach under component C includes a global review, analysis and exchange of policy experiences, lessons learned and best-practices regarding scientific, technological and policy options for reducing nutrient over-enrichment from land-based sources. Intergovernmental organizations, regional and national programmes, GEF projects, industry stakeholders and civil society will be invited to the development and peer review of a Policy Toolbox for cost-effective technological and policy options. Outputs of the nutrient impact modeling and analysis (component B) will provide key inputs to the development of the overall Policy Toolbox. The partnership developed under component A will be instrumental in facilitating the exchange of experiences and best-practices. Furthermore, through the partnership component C will explore regional and/or global policy responses to nutrient over-enrichment of coastal waters, and in this context, make a direct contribution to the 3rd Intergovernmental Review of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities.

Component C will identify policy and technology options to be integrated into strategies and agreements at regional, national and sub national levels. These will vary per region depending on existing plans (i.e. SAPs, NPAs). To foster the embedding and up-scaling of successful nutrient initiatives, this work will build upon existing national and regional strategies. Particular attention will be paid to agreements and partnerships with the agri-industry, sewage and wastewater sector. Training packages will be prepared or adopted to enable countries to implement these strategies and, where possible, financial mechanisms will be suggested to ensure long-term sustainability of actions, with special focus on agreements and partnerships with the private sector. Workshops will be developed in which participants from various regions will be trained in the use of modeling outputs and the Policy Toolbox in developing strategies to address key nutrient challenges, such as over-enrichment of coral reefs, intensive aquaculture and inadequate wastewater management.

GEF work on wastewater, including constructed wetlands, will feed into the project and the development and exchange of integrated training materials, drawing lessons from current nutrient and up-scaling projects. UNEP/GPA and the Regional Seas Programme will play a catalytic role and make full use of workshops and trainings on wastewater management to promote an integrated approach to nutrient management and support use of the policy toolbox developed under this component.

Component D. Pilot testing of the use of the Policy Toolbox in the development of nutrient reduction strategies

The long term goal of the application of knowledge and integration of technology and policy options in nutrient reduction strategies is to catalyze action to address nutrient over-enrichment in coastal and marine ecoystems and upscale successful approaches. Initial assessment and analytical work under components A and B will focus on facilitating the necessary information for decision makers to pilot test the use of the Policy Toolbox in component D. This will feed in from the outcomes of IGR3 in 2011.

One *demonstration region,* for example at sub-LME level, will be identified comprising developing countries, Small Island Developing States, or countries with economies in transition. This demonstration region will pilot test the integrated package of tools and mechanisms developed under components A, B and C in order to develop nutrient reduction strategies. Agreements to implement strategies and reforms to reduce nutrient loading from land-based pollution will be pursued with relevant stakeholders at regional, national and local levels. The demonstration region will be identified during the project preparation (PPG) phase of the project. Selection criteria include rates of nutrient loading from anthropogenic sources[7], predicted major increases in nutrient loading in the future[8], nutrient assimilative capacity of coastal waters, vulnerability to climate change, the presence of existing action plans, the technical capacity and political commitments to address coastal eutrophication issues, potential for up-scaling, and international recognition as a priority area. GIWA, NPAs and TDA/SAPs of GEF funded LME projects will be consulted on this.

Throughout components A, B and C above, the project will engage relevant stakeholders from the demonstration region in the collection of information, analysis of data, and development of the Policy Toolbox. A baseline and indicators will be established for nutrient sources and impacts in the demonstration region and hands-on workshops organized for scientists and policy specialists. Lessons from the GEF project to enhance the use of science in IW projects will inform the component concerning the optimal involvement of experts and policy makers in the uptake of policy tools during the project cycle. Interactions will also be encouraged with other GEF LME projects to benefit from mutual South-South collaborations and learning, and identifying opportunities for up-scaling of successful approaches. The development of a region specific partnership under the Community of Practice (component A), will strengthen the science and policy linkages at national and local levels and facilitate the uptake of policy tools. The expected outcome is that stakeholders use the information tools and mechanisms to develop cost-effective and sustainable nutrient reduction plans and strategies to increase the quality of coastal waters in the marine ecosystem.

Component D will identify key data, information and capacity needs to implement nutrient reduction strategies, and develop a course of action based on these. Stakeholder analysis will form part of the needs assessment and take into account gender issues and social relations. The Policy Toolbox will be applied to analyze source-impact relationships and options to reduce nutrient over-enrichment and oxygen depletion from land-based sources for the selected coastal waters. Predictive capability will be strengthened by applying the model and testing different policy options for the demonstration region. Lessons learned will be captured during the pilot testing of the Policy Toolbox, including recommendations for further upscaling of tools and approaches. A plan will be developed for the demonstration region for addressing priority concerns and incorporate nutrient strategies in national and sectoral policies. Component D will also set the indicators and provide a solid methodology for the long-term tracking or nutrient sources and impacts, in line with GEF indicators and adapted for the specific circumstances in the selected site. Finally, the component will assess the potential for further up-scaling the use of tools and mechanisms developed under this project.

EXPECTED GLOBAL ENVIRONMENTAL BENEFITS:

The global environmental benefit of this project will be achieved through the enhanced knowledge, guidance and tools provided to countries, the long-term effective management of the key sources of nutrients to the coastal zone and the reduction of nutrient enrichment and oxygen depletion from land-based pollution in LMEs. The release of nutrients into groundwater and atmosphere often cross borders and create environmental, social and economic impacts along the way - until reaching the coastal zone. Thus a trans-boundary approach is essential in the design and implementation of this project and has already been identified as such by many countries involved in LMEs, implying the need for a collective response that spans different jurisdictions. The challenges presented by the large-scale flux of nutrients in the landscape and the scope of the changing nitrogen cycle remains under-appreciated in both policy and scientific circles.[11] While the extent of eutrophication in coastal and marine areas is largely but not exclusively restricted to estuaries and inner shelf areas, its expansion into open marine areas is recognized as a future threat. This project provides the foundations for sustained cooperative action and will catalyze on the outcomes from the GPA Review Meeting to help combat the disruption of the Nutrient Cycle.

[11] UNESCO/SCOPE Policy Brief Human alteration of the nitrogen cycle (April 2007)

B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL PRIORITIES/PLANS:

GEF International Waters initiatives are primarily for the benefit of developing countries, countries in transition and Small Island Developing States. Although global in scope, this project can potentially contribute to all current and future LME GEF IW projects - most of which have been endorsed by country operational Focal Points and approved by the GEF Council. In addition, many of the Strategic Action Programmes agreed to by participating countries identified actions to address nutrient over-enrichment as a priority threat to coastal waters and LMEs.

National Programmes of Action (NPAs) implement the Washington Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). They are a proven tool to advance the sustainable development of coastal areas and their associated watersheds. NPAs are developed through national multi-stakeholder processes and are a strategic tool that can assist governments, industry, tourism, agriculture or other relevant sectors and local communities to prioritise their coastal and marine protection and development goals. NPAs assist relevant authorities to formulate affordable short, medium and long-term programmes of action to achieve these goals, and to mobilise the political, legal, institutional and financial support required for implementation. Over 60 governments are currently addressing nutrient concerns through their national programmes of action, and new NPAs under development will also be encouraged to address nutrients. NPAs will serve as a starting point for this project by analyzing the programmes for national priorities during the project preparation phase. Moreover, the project takes into account the requests from countries through the Intergovernmental Review to devote additional efforts to address point and non-point nutrient sources[12]. Governments collectively agreed to include the nutrient issue in the GPA agenda at the last meeting in Beijing 2006, based on the expressed needs of the Governments which participated in this Review. Stakeholders also called on Governments and others implementing the GPA to give a high priority to identifying and implementing appropriate, cost-effective programmes and measures to address point and non-point sources of nutrient discharges, particularly programmes for the management and prevention of nitrogen and phosphorus run-off from agriculture activity.

C. Describe the consistency of the project with GEF STRATEGIES and strategic programs:

This project addresses the IW strategic objective "*to catalyze transboundary action addressing water concerns*" where the expected impacts are "*Participating states demonstrate the necessary ability to … reduce land-based coastal pollution"*. The project is entirely consistent with IW-SP2 of GEF-4 to "*reduce nutrient over-enrichment and oxygen depletion from land-based pollution of coastal waters in LMEs consistent with the GPA*." It will build on the experience from previous GEF interventions that have proven to be an effective agent for policy, legal and institutional reforms related to international waters and for the creation of enabling environments. This will be a follow-up from the STAP 2009 workshop in support of the IGR 2011.

D. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:

This project will build on lessons learned from other environmental assessments such as GIWA, GEO and the MA, and collaborate with related GEF initiatives that address nutrient over-enrichment and oxygen depletion from land-based pollution. These include, but are not limited to, those GEF Large Marine Ecosystem initiatives underway (i.e. East Asian, Mediterranean Sea, Baltic Sea, Guinea Current, Benguela Current, West Indian Ocean, Agulhas and Somali Current, Danube/Black Sea Basin, Caribbean Sea) and more generally with SIDS. Of particular importance are the *Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) Strategic Partnership Investment Fund for Pollution Reduction in the LMEs of East Asia* project, which leverages pollution reduction investment funds from the public and private sector. The GEF East Java and West Indian Oceans projects demonstrate modular approaches (i.e. small-scale sanitation with local treatment) to construct wastewater collection systems using cost-effective technology and community participation. The Strategic Partnership for the Mediterranean LME, in particular the Strategic Action Programme to address pollution from land-based activities is also of direct relevance, in particular their work to develop a replication scoring system. The GEF project on enhancing the use of science will inform this project regarding the science-policy interface and advise on the appropriate time of involving different types of scientists. Finally, the project will build upon the work and lessons learned from the GEF *Promoting an Ecosystem Based Approach to Fisheries* project, which included nutrient forecast models that were developed and adopted in at least 10 countries involved in the implementation of the GEF/LME projects for management actions to reduce coastal eutrophication.

Other GEF-related projects such as IW:LEARN (through its website), those related to the transfer of environmentally sound technologies related to nutrient reduction, the project on the role of the coastal ocean in the disturbed and undisturbed nutrient and carbon cycles, and the GEF Trans-boundary Waters Assessment Program (TWAP) will be

[12] UNEP/GPA/IGR.2/7

involved in the development and implementation of this project and to share experience, identify synergies and build a critical mass of capacity, experience and knowledge that will yield sustainable and quality results.

Several IOC programmes focus on the scientific aspects of the biology, chemistry or management of the coastal zone. For example, the goal of the Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB) programme is the improved prediction of harmful algal blooms by determining the ecological and oceanographic mechanisms underlying their population dynamics, integrating biological, chemical and physical studies supported by improved observation and modeling approaches, and specifically its core research project on HABs in eutrophic systems. The IGBP Land-Ocean Interactions in the Coastal Zone Program (LOICZ) aims to provide the knowledge, understanding and prediction needed to allow coastal communities to assess, anticipate and respond to the interaction of global change and local pressures which determine coastal change. The Integrated Coastal Area Management (ICAM) programme brings natural and social scientists, coastal managers and policy makers together to understand how to manage the diverse problems of coastal areas. These programmes all share interests in understanding and better managing the coastal zone. Nutrient loading and its effects, including the expression of coastal eutrophication, is a common element across these programs.

The project will work with the International Nitrogen Initiative (INI) network of scientists and practitioners dedicated to optimizing the use of nitrogen in food production, while minimizing the negative effects of nitrogen on human health and the environment as a result of food and energy production. INI undertakes scientific assessments, develops solutions to solve a wide variety of nitrogen-related problems, and interacts with policymakers to implement these.

In order to ensure the development of sustainable project outcomes, the GEF partnership will be developed as a targeted community under the umbrella of the Global Partnership on Nutrient Management (GPNM). The GPNM will bring together GEF and non-GEF nutrient initiatives and institutions active in addressing nutrient management issues related to coasts, oceans and small islands and their associated watersheds. The project strategy is to ensure strong collaboration so that the overall exchange and sharing of information and stakeholder involvement will eventually be absorbed by the Global Partnership on Nutrient Management after project closure.

E. DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING :

The baseline situation as described in Section A above shows a fragmented landscape of nutrient initiatives around the world. As a result GEF projects, countries and other stakeholders are not benefitting from the progressive knowledge base that is being built up in the various initiatives. This project organizes a global partnership of stakeholders for the coordination and cooperation in the field of nutrient reduction. Through the partnership and project activities, GEF projects, decision makers and other stakeholders will be provided with the tools to analyze the complex relationship between sources of nutrients and their impact on the marine and coastal environment. Taking into account the complex nature of different nutrient sources and their pathways in the environment, the project will provide countries with the information, tools and policy options necessary to integrate nutrient strategies into national and sector policies. The value-added to underpin policy and strategy development with quantitative modeling support was confirmed by GEF projects and country participants in two workshops held on this topic in 2006[13].

F. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED, AND IF POSSIBLE INCLUDING RISK MEASURES THAT WILL BE TAKEN:

Project related risk	Mitigation measures	Risk level
Comprehensive experts involvement It is essential that this project utilizes existing research and experiences from other projects and initiatives in order to provide a thorough and solid assessment of nutrient over-enrichment, their emission sources and socioeconomic and environmental impacts, along with their economic costs.	This risk is minimized by ensuring the involvement of key research institutes, networks and programmes and undertake broad dissemination of all documentation for peer review.	Low
Limited private sector involvement	The project must work closely with the industrial and agricultural sectors. Industry is	Medium

[13] The need for quantitative information on nutrient sources, coastal nutrient loading and coastal impacts was apparent during two modeling workshops for LME projects held as part of the component "Filling gaps in LME Nitrogen loadings forecast for 64 LMEs" of the GEF project: Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. Participants reported a general lack of information in their regions on the various nutrient sources, controlling factors and coastal nutrient loading, and that the workshops were very useful in providing some of the first information for their regions. They called for continuation and expansion of this work and communicated the N export and watershed source contribution results in the form of maps and reports back to their LME Directors and in many cases to local government officials who also expressed a great amount of interest.

Lack of clear understanding of the cost-benefit ratios of nutrient reduction measures, will impede the uptake and/or buy in of such measures by the target key economic sectors notably the agricultural and industrial sectors.	considered a key partner in this project and a targeted approach toward this group of stake-holders will be developed in the context of the project.	
Data and information gaps Limited quantitative data and information available regarding the costs and benefits of future implementation of nutrient reduction technologies and policy measures.	Close collaboration with other data and modeling efforts (in particular using NEWS) is required to obtain the relevant modeling outputs that could support the development of the Policy Toolbox.	Medium
Science-policy linkages The process of developing the Policy Toolbox and national or regional nutrient strategies may not be as effective in identifying the most cost-effective key policy and technological options to be implemented if policy makers are not supportive of the project and involved in the project development cycle at the appropriate time.	Policy makers and other stakeholders developing nutrient strategies will be involved from the start of the project and represented on the Steering Committee. Preliminary consultations with key donor governments as well as recipient countries, through the GPA process, have already been held and considered in the development of this concept.	Low
Climate change risks The type of activities developed under this project are not expected to pose a direct project-related climate change risk. However, the project impact (i.e. implementation of nutrient strategy) may have a climate related impact.	The project pays specific attention to climate change risks by evaluating the potential effect on coastal ecosystems of climate change and, through the model approach developed under component B, the possible effects of future climate change on nutrient and carbon loads. Climate proofing will be applied to the Policy Toolbox.	Low

G. DESCRIBE, IF POSSIBLE, THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT:

Cost-effectiveness of policy options is in the very core of the design of this project. The economic costs of nutrient over-enrichment to coastal waters will be analyzed, and also tested for future costs against the scenario whereby no measures are implemented to reduce nutrients from land-based sources. This is an important tool to assist governments in prioritizing the issue of nutrient reduction in their national planning.

A number of regional GEF projects have focused on identifying transboundary issues and formulating regional agreements for LMEs in line with the GPA and Regional Seas Conventions. These projects have resulted in detailed analysis of nutrient over-enrichment to LME's, their causes and impacts. Agreed remedial measures have been defined and action plans developed. Currently there are approximately a dozen of such projects underway, with Strategic Action Programmes (SAPs) at various stages of preparation and implementation, each with its underpinning Trans-boundary Diagnostic Analysis (TDAs) and its own extensive database. Whereas regional initiatives to bring together and upscale successful approaches are being developed, the proposed project provides the opportunity to bring GEF nutrient projects together into a global partnership, benefiting from practical experience from many countries as well as access to cutting edge science emanating from international research, including INI.

The global partnership will address the fragmented efforts and consolidate these into one platform for sharing of data, information and tools, thereby increasing the cost-effectiveness of efforts to address nutrient issues. The partnership will also invite key programmes, such as Regional Seas Programmes, to join the partnership thereby benefiting from the significant investments made by UNEP in policy, technical assistance and policy development over the past years.

In addition, the project will build upon a wide range of nutrient-related initiatives and studies, including LOICZ and the work of UNESCO IOC and GPA. Capitalizing on the establishment of the Global Partnership for Nutrient Management under UNEP-GPA, the costs of developing and sustaining the platform for the facilitation and development of nutrient partnerships are significantly reduced. The GPNM also provides a cost-effective means for the GEF Community of Practice to link to non-GEF audiences.

Through the demonstration sites, the project develops a practical approach to developing nutrient strategies based on sound scientific information. The assessment and modeling work under component A and B will focus on facilitating the necessary research and knowledge to inform the work under component D. However, the outcomes and application of tools would be made generally available to serve as a model for other regions, and the potential for up-scaling successful tools and approaches will be assessed and further promoted through the partnership.

H. JUSTIFY THE COMPARATIVE ADVANTAGE OF GEF AGENCY:

UNEP's comparative advantage is centered around information management, scientific assessments and early warning (notably related to the Global Environment Outlook process), as well as science to policy linkages at national, regional and global levels, such as in the work on ecosystem-based management, building upon the findings of the Millennium Ecosystem Assessment. UNEP also hosts the coordination office of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA); the only global intergovernmental programme that addresses theconnectivity between freshwater and the coastal environment. The GPA provides leading advice to countries to help them address land based sources of marine pollution such as nutrients, including through National Programmes of Action (NPAs) that implement the GPA at the national level. The 2002 World Summit on Sustainable Development committed governments to advancing the implementation of the GPA with a focus on wastewater, physical destruction and alteration of habitats, and nutrients. Given the leadership of UNEP and GPA, this project will capitalize on the experience and existing networks of UNEP Divisions, Regional Seas Programmes and GPA Action Plans around the world as well as the expertise from other UN Agencies and initiatives such as UNESCO, FAO, UNIDO, UN Task Force on the International Year of Sanitation, GPA Review Meeting, (INI Paris), UN-Water and UN-Oceans.

PART III: 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 country endorsement letter(s) or regional endorsement letter(s) with this template).

(Enter Name, Position, Ministry)	Date*: (Month, day, year)*

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.	
Maryam Niamir-Fuller, Director, UNEP-DGEF. GEF Agency Coordinator	Isabelle Vanderbeck Project Contact Person
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