

Document of
The World Bank

Report No:

PROJECT BRIEF

ON A

PROPOSED GRANT FROM THE
GLOBAL ENVIRONMENTAL FACILITY TRUST FUND

IN THE AMOUNT OF XX SDRS MILLION (US\$11.0 MILLION EQUIVALENT)

TO THE

[XXX]

(ON BEHALF OF GOVERNMENTS OF COMOROS, KENYA, MADAGASCAR,
MAURITIUS, MOZAMBIQUE, SEYCHELLES, SOUTH AFRICA, AND TANZANIA)

FOR A

WESTERN INDIAN OCEAN MARINE HIGHWAY DEVELOPMENT AND COASTAL AND
MARINE CONTAMINATION PREVENTION PROJECT

July 18, 2005

Version 19.02

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 3, 2005)

SDR 1.00 = US\$1.5087

Comorian franc 1 = US\$0.0026
US\$1.00 = Comorian franc 379.74

Kenya shillings 1 = US\$0.013
US\$1.00 = KES 75.00

Malagasy ariary 1 = US\$0.0005
US\$1.00 = Malagasy franc 2,011.15

Mauritian rupees 1 = US\$ 0.035
US\$1.00 = Mauritian rupees 28.7

Seychelles rupees 1 = US\$ 0.185
US\$1.00 = Seychelles rupees 5.418

South African rand 1 = US\$ 0.158
US\$1.00 = South African rand 6.34

Tanzania shillings 1 = US\$ 0.0009
US\$1.00 = Tanzania shillings 1,097.5

FISCAL YEAR

January 1 to December 31

ABBREVIATIONS AND ACRONYMS

CAS	Country assistance strategy
CLC	International Convention on Civil Liability for Oil Pollution Damage
COLREG	Convention on the International Regulations for Preventing Collisions at Sea
DANIDA	Danish International Development Agency
EC	European Commission
FUND	International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage
GEF	Global Environment Facility
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IHO	International Hydrographic Organization
IMO	International Maritime Organization
INTERTANKO	International Association of Independent Tanker Owners
IOC	Indian Ocean Commission
IPIECA	International Petroleum Industry Environmental Conservation Association
ITOPF	International Tanker Owners Pollution Federation
MARPOL	International Convention for the Prevention of Pollution from Ships
OPRC	International Convention on Oil Pollution Preparedness, Response and Cooperation
RPMU	Regional project management unit
SAMSA	South African Maritime Safety Authority
SHOM	Service Hydrographique et Océanographique de la Marine
SRPMU	Subregional project management unit
SOLAS	International Convention for the Safety of Life at Sea
UKHO	United Kingdom Hydrographic Office
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
WIO-LaB	Addressing Land-based Activities in the Western Indian Ocean Program

Vice President:	Gobind Nankani
Country Manager/Director:	James P. Bond
Sector Manager:	C. Sanjivi Rajasingham
Task Team Leader:	Abdelmoula M. Ghzala

WESTERN INDIAN OCEAN
Marine Highway Development and Coastal and Marine Contamination Prevention Project

CONTENTS

	Page
A. STRATEGIC CONTEXT AND RATIONALE	1
1. Country and sector issues.....	1
2. Rationale for Bank/GEF involvement	2
3. Higher level objectives to which the project contributes.....	3
B. PROJECT DESCRIPTION	4
1. Lending instrument	4
2. Project development objective and key indicators.....	4
3. Project global environment objective and key indicators	4
4. Project components.....	5
5. Lessons learned and reflected in the project design.....	8
6. Alternatives considered and reasons for rejection	10
C. IMPLEMENTATION	11
1. Partnership arrangements (if applicable)	11
2. Institutional and implementation arrangements.....	11
3. Monitoring and evaluation of outcomes/results.....	12
4. Sustainability and replicability	13
5. Critical risks and possible controversial aspects.....	15
6. Loan/credit conditions and covenants.....	17
D. APPRAISAL SUMMARY	17
1. Economic and financial analyses	17
2. Technical.....	18
3. Fiduciary	18
4. Social.....	18
5. Environment.....	19
6. Safeguard policies	19
7. Policy Exceptions and Readiness.....	20

Annex 1: Country and Sector or Program Background	21
Annex 2: Major Related Projects Financed by the Bank and/or other Agencies	26
Annex 3: Results Framework and Monitoring	28
Annex 4: Detailed Project Description.....	33
Annex 5: Project Costs	41
Annex 6: Implementation Arrangements	46
Annex 7: Financial Management and Disbursement Arrangements.....	48
Annex 8: Procurement Arrangements.....	50
Annex 9: Economic and Financial Analysis	55
Annex 10: Safeguard Policy Issues.....	56
Annex 11: Project Preparation and Supervision	57
Annex 12: Documents in the Project File	59
Annex 13: Statement of Loans and Credits.....	60
Annex 14: Country at a Glance	61
Annex 15: Incremental Cost Analysis.....	63
Annex 16: STAP Roster Review	72
Annex 17: Summary of Risk Assessment.....	74
Annex 18: Options for the Route of the Marine Highway in the Western Indian Ocean Region.....	82
Annex 19: Partners' Contributions.....	87

WESTERN INDIAN OCEAN
Marine Highway Development and Coastal And Marine Contamination Prevention Project

Project Appraisal Document

Africa Region
AFTTR

<p>Date: June 15, 2005</p> <p>Country Manager/Director: James P. Bond</p> <p>Sector Manager/Director: C. Sanjivi Rajasingham</p> <p>Global supplemental ID:</p> <p>Project ID: P078643</p> <p>Lending Instrument: GEF Grant</p> <p>GEF Focal Area: International Waters</p> <p>Supplement Fully Blended?: N/A</p>	<p>Team Leader: Abdelmoula M. Ghzala</p> <p>Sector(s):</p> <p>Theme(s):</p> <p>Environmental screening category: C</p> <p>Safeguard screening category: S2</p>		
Project Financing Data			
<p>[.] Loan [] Credit [X] Grant [] Guarantee [] Other:</p>			
<p>For Loans/Credits/Others:</p> <p>Total Bank Financing (US\$m):</p> <p>Proposed Terms (IBRD):</p>			
Financing Plan (US\$m)			
Source	Local	Foreign	Total
Indian Ocean Governments	0.4	1.1	1.5
GEF	2.6	8.4	11.0
Others identified donors	1.6	11.5	13.0
Total:	5.0	20.6	25.5

<p>Grant recipients: Governments of Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, and Tanzania</p>							
<p>Responsible agency: South African Maritime Authority and the Indian Ocean Commission</p>							
Address:							
Contact Person:							
Tel:		Fax:		Email:			
GEF estimated disbursements (Bank FY/US\$m):							
FY	2006	2007	2008	2009	2010		
Annual	0.4	1.8	2.9	5.5	0.5		
Cumulative	0.4	2.1	5.0	10.6	11.0		

Project implementation period: October 2005–December 31, 2009			
Expected effectiveness date: October 15, 2005			
Expected closing date: December 31, 2009.			
Does the project depart from the CAS in content or other significant respects? Ref. PAD A.3	Yes	X	No
Does the project require any exceptions from Bank policies? Ref. PAD D.7	Yes	X	No
Have these been approved by Bank management?	Yes	N/A	No
Is approval for any policy exception sought from the Board?	Yes	X	No
Does the project include any critical risks rated “substantial” or “high”? Ref. PAD C.5	X	Yes	No
Does the project meet the Regional criteria for readiness for implementation? Ref. PAD D.7	X	Yes	No
<p>Project development objective Ref. PAD B.2, Technical Annex 3: The project’s development objective is to increase the safety and efficiency of navigation. This will be achieved by establishing a demonstration marine highway to guide ships around environmentally sensitive areas and through selected busy sea lanes and by supporting widening the regional agreement on port state control and implementation of its provisions.</p>			
<p>Global environment objective Ref. PAD B.2, Technical Annex 3 The project’s medium to long-term global environmental goal is to reduce the risk of ship-based environmental contamination (such as oil spills from groundings and illegal discharges of ballast and bilge waters) and to strengthen the capacity of countries to respond to oil or chemical spill emergencies in the region.</p> <p>The project has three specific global environmental objectives. The first is to ascertain the economic, technical, and institutional feasibility of introducing precision navigation systems in the region, such as an electronically supported marine highway, to guide ships through sensitive areas and to monitor the movements and activities of fishing and other vessels operating within countries’ territorial waters. The second objective is to support widening the existing regional agreement (June 5, 1998) on port state control and implementation of its provisions. The third objective, focusing on Kenya, Mozambique, and Tanzania, is to reduce risks of environmental damage to beaches, fishing grounds, and other domestic resources from spills of oil and chemicals. This will be achieved by supporting efforts of Kenya, Tanzania, and Mozambique to become part of a regional oil spill response plan, by completing the identification and mapping of environmentally sensitive areas along coasts and sea lanes, and by widening the regional collaboration that has been built under the GEF-supported West Indian Ocean Islands Oil Spill Contingency Planning Project.</p>			
<p>Project description Ref. PAD B.3.a, Technical Annex 4 The project will support (a) the installation of a demonstration precision navigation system (marine highway) and its assessment, (b) capacity building for prevention of coastal and marine contamination, (c) widening of regional oil and chemical spill response, and (d) widening of the regional agreement on port state control and implementation of its</p>			

provisions, activities to promote coordination and collaboration with other relevant projects, and preparatory activities for the next phase of the marine highway development (assuming the concept proves feasible and provides adequate benefits to justify its costs).

Which safeguard policies are triggered, if any? Ref. PAD D.6., Technical Annex 10. None.

Significant, non-standard conditions, if any, for: Ref. PAD C.7.
None.

Board presentation: August 2, 2005

Loan/credit effectiveness: October 15, 2005

Covenants applicable to project implementation: None.

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

The growing population and expanding urbanization and economic activity in the coastal zones coupled with virtually nonexistent management are increasingly placing marine and coastal resources under threat. The shipping lanes along the East African coast are among the busiest in the world, carrying over 30 percent of the world's crude oil supplies. At any given time, hundreds of oil tankers, many of them very large crude carriers, transport crude oil from the oilfields of the Persian Gulf and Indonesia to Europe and the Americas. Over 5,000 tanker voyages per year take place in the sensitive coastal waters of Comoros and Madagascar and along the coast of East Africa, passing in close proximity to the World Heritage site of Aldabra Atoll (Seychelles). Oil and gas exploration programs operating in the region add to the risks. A large oil spill could also severely harm the economies of Mozambique, South Africa, Tanzania, Kenya, and the small island developing states by damaging fishing grounds, beaches, and diving and deep-sea fishing areas; disrupting shipping; and shutting down activities that depend on seawater intake.

Moreover, destruction of coral reefs and illegal fishing are major problems off the shores of the countries of the region. The western Indian Ocean region is one of the last areas in the world where fishing activities are largely unregulated. Vessels from Europe and eastern Asia heavily exploit tuna cape hake, blackhand sole, and other species within the exclusive economic zones, but land the catch outside the region, without reporting the catch to the national authorities. Improvements in fishing methods have led to greater numbers, larger sizes, and increased variety of fish being caught. As a consequence fish stocks are shrinking and several species face potential extinction.

Although most of the countries in the region are party to the UN Convention on the Law of the Sea (UNCLOS), have declared a 200-mile exclusive economic zone, and are in the process of establishing claims to the continental shelf, they lack the institutional and financial capacity to effectively monitor activities of vessels and to enforce their control over activities taking place within their jurisdictions and responsibilities. The lack of enforcement is contributing to the destruction of the coral reefs, to unsustainable exploitation of fisheries, and to significant damage to nontarget species, such as sea tortoises, porpoises, dolphins, and whales.

Countries of the region recognize that they cannot protect their shared marine and coastal resources working alone. Rather they need to work together to improve the safety of navigation through regional waters and to enforce regulations intended to protect fishing and other marine resources from excessive exploitation. They also need assistance to pilot new technologies that have the potential of significantly improving the safety of navigation at reasonable cost, such as a marine highway. The project will help governments achieve their objectives by supporting creation of a mechanism of regional cooperation and by piloting a marine highway.¹

¹ A marine highway is a physically-defined navigation route, providing a safe and secure navigation channel supported by continuously updated nautical charts, in accordance with the provisions of SOLAS (in paper or electronic format), maritime safety information, real-time navigation aids, and other information systems (weather updates, traffic management, access to ports, and the like). It allows ships to optimize operational safety and sailing efficiency. A marine highway will be supported by modern data management and information techniques such as

Eligibility for GEF financing

Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, and Tanzania are eligible for Global Environment Facility (GEF) financing for international waters projects. All have signed the key international maritime conventions aimed at limiting contamination and increasing the safety of navigation (International Convention on Civil Liability for Oil Pollution Damage (CLC92)), the International Convention for the Safety of Life at Sea (SOLAS), and the International Fund for Compensation for Oil Pollution Damage (FUND92).² All except for Mozambique, South Africa, and Tanzania have ratified and the International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC90). All except for Madagascar and Tanzania have ratified the Convention on the International Regulations for Preventing Collisions at Sea (COLREG, 1972).³ Comoros, Kenya, Mauritius, Seychelles, and South Africa in addition have ratified the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78/98).⁴ (See annex 1 matrix for the detailed status of conventions.)

2. Rationale for Bank/GEF involvement

The proposed project will help to catalyze and coordinate support to protect the globally-significant marine and coastal resources of the western Indian Ocean region, a role that the GEF has been uniquely designed to fill. Without such support from the GEF, the countries are not likely to come together to undertake activities that will demand local resources, but that provide regional and global benefits.

The Bank/GEF has considerable experience in supporting countries' efforts to work cooperatively in reduce transboundary pollution and increase the safety of navigation. Through its growing portfolio of regional seas and international waters projects, it has developed the skills and knowledge to help countries build national and regional capacity to manage programs that cut across countries. Through its management of the recently completed Western Indian Ocean Oil Spill Contingency Project it has developed insight into the environmental, social, and institutional issues facing the countries of the region and will draw on this knowledge in designing and managing the proposed project. Through this experience the Bank/GEF has also forged positive working relationships with many of the governments and partners that will be involved in the proposed project. Bank/GEF involvement will also help in mobilizing resources and expertise from other partners, including multilateral organizations and industry groups representing both the shipping and oil industries, and thereby improve project design, implementation, effectiveness, and sustainability.

global positioning systems, shore-based vessel traffic management systems with adequate on-board equipment, and electronic nautical charts, to the extent these are available.

² The full name is International Convention on the establishment of an International Fund for Compensation for Oil Pollution Damage, 1992.

³ The full name is Convention on the International Regulations for Preventing Collisions at Sea, 1972.

⁴ The full name is International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1998 relating thereto.

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Hydrographic Organization (IHO), the International Maritime Organization (IMO), the United Kingdom Hydrographic Office (UKHO), the Service Hydrographique et Océanographique de la Marine of France (SHOM) will be close partners in preventing marine contamination. The United Nations Environment Program (UNEP) through its Regional Seas Program will be a partner in protecting critical habitats and biodiversity. The oil industry through the International Petroleum Industry Environmental Conservation Association (IPIECA) and the shipping industry (the International Association of Independent Tanker Owners, INTERTANKO), and the International Tanker Owners Pollution Federation Limited (ITOPF) will bring knowledge of best practices in preventing contamination from ships. France has expressed interest in participating as a partner through La Réunion island.

3. Higher level objectives to which the project contributes

The project has two main global environmental objectives. The first is to help prevent ship-based environmental contamination (such as oil spills from groundings and illegal discharges of ballast and bilge waters). The second focusing on Kenya, Mozambique, and Tanzania, is to reduce risks of environmental damage to beaches, fishing grounds, and other domestic resources from spills of oil and chemicals from oil or chemical spills.

The proposed project is in line with the country assistance strategies (CASs) of the participating countries. The Kenya CAS (2004) names the proposed project as important not only to protect coastal and marine resources, but also to promote regional integration. The Mozambique CAS (2003) emphasizes the importance of protecting coastal and marine resources to promote sustainable development of tourism, a major source of growth in the country. The Madagascar CAS (2003) places environmental protection at the center of its strategy, noting the strong linkages between environmental degradation and high levels of poverty. CASs for Mauritius (2002), Comoros (2000), and Tanzania (2000) all discuss environmental protection as a key element in their strategies. No recent CASs have been produced for Seychelles or for South Africa. Both countries, however, have taken strong action to protect their coastal and marine resources in recognition of the importance of the tourism and fishing industries to their economies.

The project's global objectives are also in line with the objectives of the Nairobi convention, which are to encourage regional initiatives and cooperation among the states for the protection, management, and development of marine and coastal resources of the eastern African region. They are also consistent with those of the CLC92, OPRC90, FUND92, MARPOL 73/78, SOLAS, COLREG and other conventions of the International Maritime Organization. Collectively, these conventions require signatories to take coordinated action to protect marine and coastal resources and ensure the safety of navigation.

The project will contribute to the goals of GEF operational program 10 in several ways, and its strategic priority 3 (undertake innovative demonstration projects for reducing contaminants). It is expected to demonstrate ways to overcome barriers to adoption of best practices that limit contamination of the international waters environment by developing a marine highway to aid the navigation of ships through particularly hazardous seaways. The project will also leverage

significant private sector support to demonstrate the value of using modern technology to help ships avoid collisions in busy marine corridors. The modern technology will also permit countries to monitor and control fishing in their territorial waters.

The proposed project also satisfies the criteria for the operational strategy for international waters—to assist groups of countries to better understand the environmental concerns of their international waters and work collaboratively to address them—through its support for analytical work and establishment of information systems, for ratifying conventions and translating their provisions into law, and for building institutional capacity to more comprehensively address transboundary water-related environmental concerns.

B. PROJECT DESCRIPTION

1. Lending instrument

A GEF grant of US\$11.0 million will finance a full-sized project. GEF financing is expected to establish technological standards and to reduce costs to early users of the technology.

2. Project development objective and key indicators

The project's development objective is to increase the safety and efficiency of navigation. This will be achieved by establishing a demonstration marine highway to guide ships around environmentally sensitive areas and through selected busy sea lanes and by supporting widening the regional agreement on port state control and implementation of its provisions.

Key performance indicators include:

- Number of ships traveling through the region using the marine highway for navigation.
- Number of ship inspections carried out at major ports in the region.

3. Project global environment objective and key indicators

The project's medium to long-term global environmental goal is to reduce the risk of ship-based environmental contamination (such as oil spills from groundings and illegal discharges of ballast and bilge waters) and to strengthen the capacity of countries to respond to oil or chemical spill emergencies in the region.

The project has three specific global environmental objectives. The first is to ascertain the economic, technical, and institutional feasibility of introducing precision navigation systems in the region, such as an electronically supported marine highway, to guide ships through sensitive areas and to monitor the movements and activities of fishing and other vessels operating within countries' territorial waters. This will contribute to the objectives of the Agulhas and Somali Large Marine Ecosystem Program, which are to assess the large marine ecosystem through transboundary diagnostic analyses and the preparation of strategic action programs. The second objective is to support widening the existing regional agreement (June 5, 1998) on port state control and implementation of its provisions. The third objective, focusing on Kenya, Mozambique, and Tanzania, is to reduce risks of environmental damage to beaches, fishing

grounds, and other domestic resources from spills of oil and chemicals. This will be achieved by supporting efforts of Kenya, Tanzania, and Mozambique to become part of a regional oil spill response plan, by completing the identification and mapping of environmentally sensitive areas along coasts and sea lanes, and by widening the regional collaboration that has been built under the GEF-supported West Indian Ocean Islands Oil Spill Contingency Planning Project.

Key performance indicators include:

- Precision navigation system installed and its feasibility for the region assessed with the full involvement of industry groups. Should the concept prove feasible, a plan for further development is put into place.
- Authorities responsible for monitoring and controlling the activities of large fishing vessels use the tools of the marine highway for monitoring and contribute fully to the assessment of its feasibility.
- Access to information and tools needed to effectively manage marine and coastal resources improved, especially in Kenya, Tanzania, and Mozambique.
- Kenya, Tanzania, and Mozambique ratify relevant IMO conventions and join the regional oil spill contingency plan.
- Proportion of ships that do not comply with international standards arriving at ports in the region declines compared with a baseline.
- Government entities and industries are satisfied with the performance of the regional institute responsible for coordination.
- Coordination and collaboration among related GEF-supported initiatives improves.

4. Project components

The project will include Kenya, Mozambique, South Africa, Tanzania, Madagascar, Comoros, Mauritius and Seychelles, and as a partner La Réunion (France), covering a combined coastline of 13,300 kilometers. By adapting the model developed for the Straits of Malacca and Singapore, the development of the western Indian Ocean marine highway will be implemented in phases. The first phase (the project) will establish as a pilot an electronically supported marine highway for some of the region's major shipping routes, will assess the feasibility of the concept, and, should the concept prove viable, will finance preparation of a follow-up project agreed upon by the countries. The second phase (or a follow-up project) will build on the experience of the first phase and establish a full marine highway covering all major shipping routes of the western Indian Ocean region.

Components include:

Component A: Development of a regional marine highway. This component will support the establishment of a network of electronic navigational charts incorporating information environmental assets (reefs, nurseries, migration areas, and the like) in conjunction with the differential global positioning system and other maritime technologies, which will form the backbone of a marine highway extending from South Africa to the Mozambican port of Nacala (west of Comoros) to Aldabra (Seychelles). Vessels will voluntarily use the electronically

supported segments of the marine highway in South Africa, again at Inharrime (Mozambique), and again at Nacala, and then again at Aldabra until leaving the marine highway. As the area between these points is in deep water and is far from the coasts, the area will be surveyed and electronic charts will be provided to vessels. In addition, the route north from the Seychelles will be surveyed to provide mariners with up-to-date information on how to navigate the route safely after they leave the marine highway.

The component includes six subcomponents: (1) production of nautical charts and publications incorporating information on environmental assets; (2) maintenance of these charts and publications; (3) survey and rehabilitation of the main aids to navigation on the route of the marine highway; (4) establishment of an automatic information service and ship reporting scheme; (5) search and rescue activities; and finally (6) the evaluation of the demonstration phase and preparation of the second phase if the demonstration phase proves to be feasible and sufficiently beneficial to justify costs.

It is expected that the large vessels transporting oil and chemicals will choose to sail under the control of the marine highway, rather than outside its boundaries, because doing so will reduce their risks of groundings and collisions and increase their efficiency of navigation. The technology of the marine highway is expected to assist fishing authorities with monitoring, control, and surveillance of large fishing vessels. All countries of the region either already require or are planning to require fishing vessels that operate in their territorial waters to install and operate an automated satellite-linked vessel monitoring system on their ships. Vessel monitoring systems provide information to the fishing authorities on the location of a vessel, speed, and course of a vessel. They allow the authorities to check whether the vessel operates where fishing is not allowed, holds the necessary licenses and quotas to fish in the area, or has sailed to a port without declaring its landings. The proposed project will collaborate with the national fishing authorities to ensure that the technology of the marine highway is as useful as possible to monitor and control fishing activities. Where fishing boats are not already using a vessel monitoring system, mechanisms to hasten their adoption—such as requiring them to install the necessary equipment on their boats (provided at no cost by the project) in exchange for a license—will be explored with the fishing authorities. The evaluation of the demonstration project will include an in-depth study of the costs and benefits to large fishing vessels of using a marine highway, and will specify a range of regulatory and other measures that would encourage such vessels to use it.

Component B: Capacity building for prevention of coastal and marine contamination. This component contains four subcomponents. The first will support seminars and workshops on environmental sensitivity mapping, issues related to implementation of conventions, marine navigation safety, prevention of marine and coastal pollution, risk assessment and development of appropriate response strategies, enforcement of fisheries regulations, and related matters. The second subcomponent will support the creation of site-specific pollution prevention and contingency management plans for coastal and marine hotspots. The third subcomponent will support the development of a methodology to identify and assign values to the key environmental resources in the region. The fourth will support the development of a regional database and a geographic information system on the marine environment, marine and coastal resources, ship movements, ship waste, and sea-based activities.

Component C: Widening capacity for regional oil spill response. This component will assist Kenya, Mozambique, and Tanzania (1) to develop national oil and chemical spill contingency plans, (2) to identify and overcome obstacles to ratifying IMO conventions intended to protect the marine and coastal environments and to improve the safety of navigation, (3) to support the preparation of a regional marine pollution contingency plan that covers all participating countries, and (4) to strengthen a regional center to coordinate national actions and to monitor regionwide environmental conditions and causes of degradation and damage. GEF financing will in particular assist countries to ratify conventions and to enact the enabling legislation. The IMO, IPIECA, the EC, and France are expected to support, contribute to, or cofinance the preparation of the national oil spill contingency plans.

Component D: Port state control, regional institutional strengthening, and project management. Port state control allows countries to require that ships entering their ports meet the requirements of the major conventions of the IMO on the safety of navigation and the prevention of pollution from ships regardless of whether or not the flag state is party to the conventions. Port state control also helps to make the operations of illegal, unreported, unregulated fishing fleet unprofitable by eliminating opportunities to land and sell fish that have been harvested in violation of the law. A regional port state control arrangement provides an effective tool to ensure that ships using international navigation routes and calling on major ports in a region comply with the rules and standards set out in the applicable IMO conventions.

A memorandum of understanding for port state control in the Indian Ocean was signed on June 5, 1998, by Australia, Bangladesh, Djibouti, Eritrea, India, Iran, Kenya, Maldives, Mauritius, Mozambique, Myanmar, Seychelles, South Africa, Sri Lanka, Sudan, Tanzania and Yemen. This component will support the widening of this regional agreement to include Madagascar and Comoros. Based on the work undertaken or envisaged by the IMO, this component will also support its implementation in countries participating in the project, covering issues such as procedures for surveillance, inspection, and detention of ships, and arrangements for exchanging information. It will support capacity building, including training of inspectors to international standards in port state control. Finally, it will support several regional workshops aimed at developing consensus among countries on priority actions, administrative arrangements, and coordination mechanisms to be used in promoting regional marine environmental management.

Assistance will be needed at the regional, subregional, and national levels to manage the project and coordinate the various activities. This component will finance equipment, staff, and logistical support required by the regional body, a subregional entity, and national institutions to ensure that the project is implemented efficiently and to build sustainable capacity of the participating entities to manage the development of the marine highway and to coordinate activities after the project is completed. It will also strengthen the technical capabilities and the institutional and coordinating arrangements among the concerned states to collectively prevent, manage, and respond to transboundary marine pollution. This component will support technical assistance and studies as needed during project implementation. It will support creation of capacity for monitoring key performance indicators and for evaluating project implementation progress and impact. This component will also support the establishment of mechanisms for

sustainable financing of the development of the marine highway and other infrastructure and capacity created through the project.

A key element of the project is its commitment to coordinate and collaborate with other projects in the region that are working to protect the marine and coastal environment. This component will support activities to facilitate such coordination and collaboration, such as establishing and maintaining a project website that links to the GEF Secretariat and International Waters-Learn website, hosting regional workshops, attending the workshops and events of others, participating in the GEF-International Waters Conferences (including providing exhibits), and the like. A detailed coordination action plan and budget will be developed during appraisal in collaboration with the related GEF-supported projects and finalized by the time of GEF Council endorsement of the project.

GEF funds will complement technical assistance provided through the other partners in the program, and will finance only activities that contribute to global environmental benefits and that others cannot finance. Specifically, GEF funds will finance activities designed to prevent marine and coastal contamination activities and activities that support surveillance and enforcement of laws and regulation governing the shipping and fisheries industries. This includes development and installation of a pilot marine highway, support for widening and implementing the regional agreement on port state control, and activities to promote coordination and collaboration among relevant projects. The oil spill contingency planning activities are largely baseline activities, and the GEF will allocate limited funding for these, focusing on the activities designed to widen the regional plan and strengthen regional collaboration.

5. Lessons learned and reflected in the project design

To safeguard the marine and coastal ecosystems of the western Indian Ocean islands from the risks and consequences of oil spills, the GEF in 1998 financed the West Indian Ocean Islands Oil Spill Contingency Planning Project, which closed June 30, 2004. The project achieved its development objectives. A GEF Secretariat-managed project review completed in August 2002 rated as satisfactory the project approach, the project's country ownership, stakeholder participation, and sustainability. The review also rated as high the project's cost effectiveness and replicability. Importantly, the review noted that benefits are likely to be sustained once the project is complete. Lessons learned from this project and others include:

- *Obtaining government commitment during project preparation to specific arrangements for institutional and financial sustainability helps to ensure that project investments will be sustained after the project closes.* The proposed project includes a subcomponent focused on developing mechanisms for the sustainable financing of the marine highway, the oil and chemical spill response capacity, and other project investments to ensure that the benefits of the project are sustained. The private shipping industry is expected to contribute significantly to the costs, because it will benefit from the increased efficiency and safety of navigation.
- *The choice of implementing agency and of project coordinator is key to the successful implementation of a complex project involving several countries and partners.*

- *Building effective partnerships with relevant organizations, industry, and governments of non-beneficiary countries can help significantly improve project design and implementation.* The West Indian Ocean Islands Oil Spill Contingency Planning Project involved the IMO, the oil and shipping industries (both local companies and IPIECA), and France (Réunion) as partners in designing and implementing the project, which contributed to its success. Similarly, the IMO, oil and shipping industries (IPIECA, INTERTANKO, ITOPI), and France (Réunion) have been participating in designing the proposed project, offering insights of experience and expertise. The involvement of these entities in design is also leading to definition of their roles and responsibilities during project implementation.
- *Pairing weaker countries with stronger ones in a regional project can help to quickly build the capacity of the weaker ones.* Mauritius, Seychelles, and South Africa have much greater capacity than the other participating states. Their involvement will help Comoros, Kenya, Madagascar, and Mozambique to catch up. Being part of a regional plan will provide a strong incentive for all states to build and maintain capacity, even during periods of political uncertainty.
- *Coordinating closely with other GEF-supported activities is critical to success.* The proposed project is designed as an integral part of the overall ecosystem approach to better manage the living resources and habitat of the Agulhas and Somali large marine ecosystems. While not a component of the Agulhas and Somali Large Marine Ecosystem Program, it complements the activities of three projects that are (the Addressing Land-based Activities in the Western Indian Ocean Program (WIO-LaB), the Southwest Indian Ocean Fisheries Project (SWIOFP), and the Western Indian Ocean Large Marine Ecosystem Project (WIO MEP)), in contributing to the objective of the overall program: to assess the large marine ecosystem through transboundary diagnostic analyses and the preparation of strategic action programs. For example, it contributes to this assessment by producing electronic nautical charts, publications, and ecosystem sensitivity maps that incorporate scientific information on ecosystem and fishery conditions generated through the UNDP-executed WIO MEP and the World Bank-executed SWIOFP. In turn, the proposed project will project trajectories of oil spills and estimate the potential impact on fisheries of oil spills, enriching the overall knowledge base required for preparation of the strategic action programs. The project team is also collaborating closely with the team preparing the World Bank-executed SWIOFP to ensure that both projects fully benefit from potential synergies. For example, observers of fishing activities can be placed on the oil tankers and other ships that use the marine highway. The teams are also working together to identify the most effective ways of using the advanced technology for monitoring,

In contributing to the objectives of the Agulhas and Somali Large Marine Ecosystem Program, the proposed project will also coordinate with the Tanzania Marine and Coastal Environmental Management Project to ensure that the newly-established Tanzania Deep Sea Fishing Authority participates in testing the marine highway as a tool to monitor the activities of large fishing vessels and in assessing its feasibility and benefits. The project will coordinate with the IMO/GEF/UNDP Global Ballast Water Management Program, which seeks to assist developing countries to implement effective measures to control the introduction of foreign marine species.⁵ Finally, the project will potentially benefit from the knowledge generated through the GEF-supported Targeted Research Project on Coral Reefs on effective measures to restore coral reefs that have been damaged by spills of oil or chemicals. To avoid duplication of studies and analytical work, the proposed project will build on activities and results from related projects as they become available and will limit studies, mapping and information collecting to the specific needs of the project. The approach of the proposed project is expected to be useful in the efforts to improve the management of the large marine ecosystems of the western African coast, such as the Benguela current which runs up the west coast of South Africa. Subcomponent D3 provides funding for collaboration of the related GEF-supported projects. A collaboration action plan will be elaborated during appraisal and be finalized before GEF Council endorsement of the project.

6. Alternatives considered and reasons for rejection

Project alternatives considered during preparation include:

- *Developing a project involving just the Indian Ocean island states.* This was rejected because the coastal states of Kenya, Mozambique, and Tanzania asked to be included in the regional contingency plan to address oil and chemical spills. Their participation will considerably strengthen the regional plan and therefore the capacity of countries to prevent and respond to an oil or chemical spill emergency. Their participation is also critical to the objective of creating a seamless marine navigation system that ships can rely on using a single set of equipment, thus reducing costs and complexities for ship owners.
- *Developing a project focusing only on oil and chemical spill contingency planning.* This was rejected in favor of a more comprehensive approach involving activities to *prevent* emergencies in addition to responding to them.
- *Addressing only the environmental concerns arising from the transportation of oil and chemicals.* This was rejected in favor of exploring the use of the marine highway to control

⁵ The full title of the project is Removal of Barriers to the Effective Implementation of Ballast Water Control and Management Measures in Developing Countries.

unsustainable exploitation of marine and coastal resources, a serious and growing problem in the southwest Indian Ocean.

C. IMPLEMENTATION

1. Partnership arrangements (if applicable)

The project will be implemented in partnership with multilateral organizations, with industry groups representing both the shipping and oil industries, and with donors. Specialized international organizations—including IALA, the IHO, the IMO, the UKHO, and SHOM—will be close partners in preventing marine contamination and in developing the national and the regional oil spill response contingency plans. UNEP through its Regional Seas Program will be a partner in protecting critical habitats and biodiversity. UNDP will be a partner in assessing risks to the ecosystem of the western Indian Ocean. The oil industry (IPIECA) and the shipping industry (INTERTANKO and ITOPF) are likely to provide expert advice and technical support to the project. France has expressed interest in participating as a partner through La Réunion island. Both the EC and the Danish International Development Agency (DANIDA) have expressed interest in providing support for project activities (see annex 19).

2. Institutional and implementation arrangements

Project implementation period. The project will be implemented during fiscal 2006–10, completed by June 30, 2009 and closed by December 31, 2009.

Executing agencies. Given the technical nature of some aspects of the project and the large number of countries involved, several options are being considered for project management. One is to appoint a regional project management unit (RPMU) headed by a regional coordinator to be responsible for implementing component A (development of a regional marine highway), component D (port state control and regional institutional strengthening), and for overall coordination of project implementation. The RPMU will also be accountable for ensuring that financial reporting and auditing requirements are met and that procurement, disbursement, and financial management policies and procedures are complied with. The South African Maritime Safety Authority (SAMSA) is being considered as a suitable organization to serve as the RPMU. Establishing a subregional project management unit (SRPMU) at the Indian Ocean Commission (IOC) is also being considered to implement project components B (capacity building for prevention of marine and coastal contamination) and C (widening oil and chemical spill response capacity). The IMO is expected to serve as an executing agency at the subcomponent level. Project implementation coordinators from the ministry of transport of each country will coordinate implementation of the national-level activities and all beneficiary agencies. The project will help build the capacity of the RPMU, the SRPMU, and the PICs for project management and project monitoring.

Project oversight. A steering committee—comprising senior officials responsible for transport or the environment or both of each of the beneficiary countries, the Chief Executive Officer of SAMSA and the Secretary General of the IOC—will be responsible for the overall monitoring of project implementation.

Procurement. Works, consultants and equipment to be financed under the GEF grant will be procured according to World Bank procurement guidelines dated May 2004.

Accounting, financial reporting and auditing arrangements. The RPMU and the SRPMU will establish before September 30, 2005 project accounting systems tracking the cost of the various goods and services provided under the project, according to the most recent World Bank Financial Management Guidelines published by the World Bank. They will keep separate project accounts together with their statutory financial statements. Terms of reference for annual audits of project accounts and semiannual audits of the statement of expenditures will be agreed upon at negotiations. Auditing will be carried out by independent auditors acceptable to the Bank, and the reports of such audits will be submitted to the Bank no later than six months after the end of the fiscal years of the RPMU and SRPMU for the project accounts and no later than three months after the end of each calendar semester for the statements of expenditure.

Supervision. The Bank will devote some 100 staff weeks to supervise progress under the GEF grant through fiscal 2010. Supervision will focus on progress in achieving specific objectives, such as establishing the marine highway, ratification of conventions, development of the national and regional contingency plans, development of capacity for port state control, procurement, financial management, and overall project implementation. During supervision and project reviews, particular attention will be paid to implementation of the mechanisms designed to promote institutional and financial sustainability.

3. Monitoring and evaluation of outcomes/results

To track progress towards the desired outcomes, the RPMU and the SRPMU will regularly monitor a set of intermediate results indicators in accordance with the results framework specified in annex 3 of the Bank's Project Appraisal Document. This results framework names the key output and outcome indicators, annual targets, baseline situation, source of data, frequency of data collection, and entity responsible for collecting and reporting the data. The PMUs will produce monthly reports describing progress in implementing the components for which they are responsible and noting trends in key performance indicators where information is available. They will in addition produce semiannual reports, commencing six months after project effectiveness, summarizing the progress achieved during the previous six months and submit them to the Bank within one month thereafter. Project managers will pay close attention to the information contained in the progress reports to quickly identify and address challenges to implementation. Monitoring reports will also be shared with all project stakeholders, including government officials. Monitoring reports will also serve as key inputs to project planning and strategic exercises and to steering committee meetings. The RPMU will monitor implementation of the overall project through quarterly financial management reports and annual technical audits (Project Appraisal Document, annex 7). The project will support under component D development of the project monitoring system and creation of capacity for monitoring as needed within the RPMU and the SRPMU.

Midterm review and implementation completion report. A midterm review will be carried out no later than December 2007 by the Bank, together with the RPMU and SRPMU and the other involved parties. In addition to covering all areas included in annual reviews, the midterm

review will focus on the project's institutional and financial arrangements, the monitoring and evaluation system, and progress with implementation of all aspects of the project. The midterm review is also expected to thoroughly review and assess the institutional and financial sustainability action plans of each beneficiary country and to lay out the options for institutional and financial sustainability of the project's regional aspects. Finally, it will recommend measures to reorient the project if needed to ensure that it achieves its objectives. Prior to the midterm review, the RPMU and the SPMU will contract a consultant (under GEF finance) to review and assess the progress of project implementation and prepare the necessary documentation for the review. No later than four months after the project closing date, the RPMU with input from the SRPMU will prepare and provide to the Bank a report on the execution of the project, its costs and the current and future benefits to be derived from it to be used in the preparation of the Bank's implementation completion report.

4. Sustainability and replicability

Sustainability. Participating governments are required to commit at negotiations to establishing mechanisms to sustain the marine highway, the environmental information systems, and the national and regional contingency plans and other project investments to ensure that the benefits of the project are sustained. The PDF Block B grant is financing a study of options for institutional and financial sustainability. The oil and shipping industries are expected to contribute significantly to the costs, because they will benefit from the increased efficiency and safety of navigation and from the reduced risk of catastrophic damage in the event of an accidental oil or chemical spill. Similar mechanisms were established successfully under the West Indian Ocean Islands Oil Spill Contingency Planning Project, following the recommendations of an institutional and financial sustainability study. In addition, it is expected that countries will generate some income by selling the updated nautical charts and publications to the shipping industry.

Replicability. The proposed project will create a pilot marine highway, which if successful, is expected to be a model for replication in the southwest Indian Ocean region and in other sea lanes of the world. Two proposed GEF-supported projects—the Malacca Straits Marine Electronic Highway Demonstration Project and the Yemen Coastal and Marine Management Project (that will informally extend the marine highway through the Gulf of Aden)—will in particular benefit from the lessons learned from the western Indian Ocean project. As with the Western Indian Ocean Islands Oil Spill Contingency Planning Project, the PMUs will actively disseminate project lessons through a variety of means. These will include maintaining websites with up-to-date information on project experiences, producing films for broadcast on television or distribution through DVD, publishing newsletters for distribution to the public, inviting government ministers and other officials to key project events and inviting the press to cover such events, hosting study visits of policymakers and others interested in learning more, and contributing to relevant international conferences. The PMUs will also create information packets targeted to specific stakeholders, such as policy makers, local fishers, ship operators, port and oil industry decisionmakers, and the like. Knowledge of new techniques to prevent and deal with oil spills will be continuously updated and shared among the participating countries through the regional institution that has been established for this purpose under the earlier project. Similarly best practices regarding the safety of navigation, monitoring of the state of

fisheries, coral reefs, and ecosystem health and the means of managing and protecting resources will be shared through workshops and national and regional forums. Monitoring and evaluation reports will be regularly distributed to participating government agencies. Should the marine highway prove to be feasible, government officials and other interested parties from other regions will be invited to visit the project area and learn about the project first hand through discussions with SAMSA, with government officials, and with ship operators who are using the navigational aids.

5. Critical risks and possible controversial aspects

	Risks	Risk Mitigation Measures	Risk r a t i n g w i t h m i t i g a - t i o n
To project development objective	<p>Ship owners and operators lack interest in financing and using the technology underpinning the marine highway.</p> <p>Governments are unwilling to provide resources to finance operations and maintenance of the infrastructure created under the project.</p> <p>No regional center is identified and funded to coordinate national and regional efforts to prevent and respond to oil and chemical spill emergencies.</p>	<p>A pilot will be installed in a limited area and its feasibility for expansion assessed. Measures to encourage the use the marine highway (such as requiring major compensation for environmental damages from vessels not using it) will be identified as part of the evaluation of the pilot phase.</p> <p>The PDF Block B grant is financing a study identifying financing options for countries. Commitment to a source of funding will be made during negotiations.</p> <p>Countries' agreement to identifying a regional body and a source of funding for its coordination activities is a condition of Board presentation.</p>	<p>S</p> <p>S</p> <p>M</p>
	Support of partners is not provided in agreed amounts or when expected.	Partners will submit letters during appraisal, specifying the amount and nature of their planned assistance. The project has been designed to permit flexibility in the timing of contributions. Should any partner be unable to fulfill its commitments, the project implementers will seek support from an alternative source.	
To component results	<p>Countries are unable to implement national and regional activities in coordination with each other.</p> <p>Administrations in Mozambique or Tanzania are unable to encourage their parliaments to enact the necessary legislation to ratify the IMO conventions.</p> <p>Governments of Madagascar and Comoros are unable to reach agreement to join the existing regional memorandum of understanding on port state control</p>	<p>An established regional and subregional body will be selected to implement the project. Adequate training and technical assistance will be provided. World Bank procurement and financial management specialists are available in nearly all participating countries and will support the implementers.</p> <p>Written commitment of administrations to initiate the process necessary to ratify the relevant international conventions is a condition of participating in the activity.</p> <p>The project will finance consultations, high-level workshops, and technical assistance and expertise to help governments understand the benefits of port state control, reach agreement, and strengthen the national capacity for performing its provisions</p>	<p>S</p> <p>S</p> <p>S</p>

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N (Negligible or Low Risk)

6. Loan/credit conditions and covenants

During negotiations

- Participating countries agree on action plans for institutional and financial sustainability of the infrastructure and capacity created by the project, satisfactory to the Bank.
- RPMU and the SRPMU agree on date and format of a midterm review.

Conditions of effectiveness

- Steering committee established and its members appointed.
- Partners participating in the project provide letters to the Bank expressing support for the project and their willingness to assist with its implementation.
- Governments of participating countries commit in writing (in a format provided by the World Bank) to provide the necessary resources to execute the project.

D. APPRAISAL SUMMARY

1. Economic and financial analyses

Economic analysis. The economic benefits from the project will derive from three main sources. First, the marine highway once established will lower the costs of shipping by reducing the risk of accidents and by allowing ships to operate in storms and other adverse conditions that would idle them if they relied on conventional navigational systems. It will also generate value for the fishing industry by contributing to improved management of fish stocks. Second, the expansion of the regional oil and chemical spill contingency plan, the development of national plans for the countries of continental Africa, and improved port state control will reduce the risks of catastrophic environmental and property damage and loss of life from oil and chemical spills, which should be reflected in reduced insurance costs. Third, the improved environmental information systems will help policy makers to better manage natural resources. Quantification of the costs and benefits of the project is not possible at this time. The proposed project will support the installation of a demonstration marine highway, and neither the costs nor the benefits of a future investment can be assessed at this time.

Financial analysis. The project is will have limited if any fiscal implications for participating countries. Ship owners are expected to bear most or all of the costs for maintaining and operating the marine highway through user fees, because they will benefit directly from the improved navigational services. Countries have agreed to identify sources of financing to sustain capacity for national and regional oil spill response, environmental information systems, and the like. Countries that are signatories to the CLC92 and the FUND92 conventions have a strong incentive to maintain oil spill response capacity once created. These conventions entitle signatories to compensation for damage arising from oil spills, but only if countries have maintained adequate capacity to respond to an oil spill and limit its damage. The experience of the countries participating in the Western Indian Ocean Islands Oil Spill Contingency Planning Project demonstrates that the resources required in any case are not substantial. Mauritius, which

maintains a relatively high level of capacity as it seeks to become a transshipment port for the region, is allocating less than US\$35,000 per year for this purpose.

A study identifying sustainable institutional and financial arrangements is being completed. With project support, countries will prepare action plans to be agreed, and implement the recommendations of the study during project implementation.

2. Technical

The technology for the marine highway has been chosen to take advantage of advances in technology that improve the navigational decisionmaking of mariners and reduce the costs to levels that make their use feasible in even poor regions. It involves an integrated system of electronic nautical charts, continuous real-time positioning information, information on environmental assets (reefs, nurseries, migration areas, and the like), aids to navigation and shore-based automatic ship identification system,, transponders, and provision of real-time meteorological, oceanographic, and navigational information. Shipmasters use the information to guide their ships safely around environmentally sensitive areas and through busy shipping lanes. Shore-based authorities use the information to precisely identify and track ships. The marine highway is thus a valuable tool for preventing and controlling marine pollution and ensuring the safety of navigation. It may also prove to be a valuable tool for monitoring fishing activities and for enforcing regulations and international agreements intended to ensure sustainable management of fisheries and of other marine and coastal resources. The technologies for the oil spill contingency planning and for the environmental information systems have been chosen because they are state of the art.

3. Fiduciary

Capacity of the IOC for financial management and procurement is satisfactory. Assessments of capacity carried out during the implementation of the Western Indian Ocean Oil Spill Contingency Planning Project have consistently found the organization in full compliance with Bank procedures concerning financial management and procurement.

An assessment of capacity of SAMSA for financial management and procurement will be completed during appraisal.

4. Social

Key stakeholders have been involved in preparing the project. These include the ministries of transport and environment, port authorities, groups representing the oil shipping industry (IPIECA, INTERTANKO, ITOPF), groups representing navigation (International Hydrographic Bureau, International Hydrographic Organization, the UKHO, SHOM, and IALA), the IMO, local oil and shipping firms, groups representing the fishing industry, and development partners. Both the UNDP and the UNEP have been consulted to ensure that complementarities among relevant projects are used to maximum effect. The teams preparing two proposed GEF-supported projects aimed at improving the management of deep water fisheries—the Tanzania Marine and Coastal Environmental Management Project and the Southwest Indian Ocean

Fisheries Project—have also been involved in discussions on possible ways the marine highway can be used effectively to monitor the activities of large fishing vessels and enforcing regulations of the fisheries, coral reefs, and other marine and coastal resources. Local communities in the countries developing capacity to respond to oil spills have been consulted during project preparation through meetings organized by community leaders.

The proposed project was discussed at a high-level seminar in December 2004 organized by SAMSA with participation of the various stakeholders to take stock of the risks as established by the risk assessment study, and to agree on the final project objectives, design, and implementation arrangements. Its recommendations have improved the project design.

The involvement of stakeholders in preparing the project provides a solid foundation for stakeholder participation during project implementation. Workshops will be held periodically with relevant stakeholders for purposes of training, knowledge sharing, and institution building. Annual project planning workshops will also be held with the participation of all key stakeholders to prepare the following year’s work program, specifying the role and contribution of each of the stakeholders to the implementation of the project. Local communities will participate in designing information campaigns on the risks of oil spills and measures that could be taken to prevent them. This was done very effectively under the Western Indian Ocean Oil Spill Contingency Planning Project. A key output of the project is expected to be a strengthened regional institution which provides a permanent forum through which various stakeholders come together to discuss issues of common concern and coordinate their actions. Local oil and shipping companies and port authorities will be part of the national and regional contingency plans. A detailed stakeholder involvement plan will be prepared no later than project appraisal.

5. Environment

The project will finance primarily technical assistance to develop a marine highway, to widen regional capacity to respond to oil and chemical spills, and to support extending and implementing the regional agreement for port state control. Since the purpose of the project is to improve the safety of navigation and to reduce the risk of environmental damage from spills of oil or chemicals, progress towards these goals will be monitored through the monitoring framework established for the project.

6. Safeguard policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Natural Habitats (OP/BP 4.04)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pest Management (OP 4.09)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Property (OPN 11.03 , being revised as OP 4.11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Involuntary Resettlement (OP/BP 4.12)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Indigenous Peoples (OD 4.20 , being revised as OP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Forests (OP/BP 4.36)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Safety of Dams (OP/BP 4.37)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects in Disputed Areas (OP/BP/GP 7.60)*	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Projects on International Waterways (OP/BP/GP 7.50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

No safeguard policies are triggered by this project.

The safeguard screening category is S2 (no safeguard issues).

The environmental screening category is C (no adverse environmental impact).

7. Policy Exceptions and Readiness

No policy exceptions are required for this project. The project is expected to meet the regional readiness criteria by the time appraisal is complete.

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims to the disputed areas.

Annex 1: Country and Sector or Program Background

Marine Highway Development and Coastal and Marine Contamination Prevention Project

Background

The western Indian Ocean region includes five coastal countries (Kenya, Mozambique, South Africa, Tanzania, and Somalia), one large island state (Madagascar), three small island states (Comoros, Mauritius and Seychelles), and the island territories of France in the southwest Indian Ocean (La Réunion). The region contains two of the world's 64 major large marine ecosystems, the Agulhas current and the Somali current. The Agulhas current flows south along the continental shelf of Mozambique and South Africa, and includes Comoros, Seychelles, La Réunion, Mauritius, and Madagascar. It pushes against the near-freezing waters of Antarctica before meeting the cold Benguela current off the Cape of Good Hope. The species and habitats of the Agulhas current are unique. The coastline harbors mangrove forests, unique parabolic sand dunes, coral reefs of high degrees of endemism and biodiversity, and beds of sea grass that provide food and habitat for seabird colonies, sea turtles, and numerous fish. The Somali current stretches along the coast of East Africa from Dar es Salaam in the south to just north of the island of Socotra off the coast of Yemen. It includes Somalia, Kenya, and Tanzania. About 5 percent of the world's fish catch comes from this large marine ecosystem, including the Indian oil sardine, mackerel, small tuna, pelagic shrimp, tunas, barracuda, kingfish, jacks, and several rare fish species.

Threats

The growing population and expanding urbanization and economic activity in the coastal zones coupled with virtually nonexistent management are increasingly placing marine and coastal resources under threat. The shipping lanes along the East African coast are among the busiest in the world, carrying over 30 percent of the world's crude oil supplies. At any given time, hundreds of oil tankers, many of them very large crude carriers, transport crude oil from the oilfields of the Persian Gulf and Indonesia to Europe and the Americas. Over 5,000 tanker voyages per year take place in the sensitive coastal waters of Comoros and Madagascar and along the coast of East Africa, passing in close proximity to the World Heritage site of Aldabra Atoll (Seychelles). Oil and gas exploration programs operating in the region add to the risks. A large oil spill could also severely harm the economies of Mozambique, South Africa, Tanzania, Kenya, and the small island developing states by damaging fishing grounds, beaches, and diving and deep-sea fishing areas; disrupting shipping; and shutting down activities that depend on seawater intake.

High winds and high seas are common in the region, raising the risk that ships will accidentally spill oil, chemicals, noxious liquid wastes, and other hazardous substances. Currently, slicks brought in from spills in the open ocean by coastal currents frequently mar beaches and damage coral reefs. Discharges of contaminated ballast water and from refineries add to the load.

Moreover, destruction of coral reefs and illegal fishing are major problems off the shores of the countries of the region. The western Indian Ocean region is one of the last regions in the world where fishing activities are largely unregulated. Vessels from Europe and eastern Asia heavily

exploit tuna cape hake, blackhand sole, and other species within the exclusive economic zones, but land the catch outside the region, without reporting the catch to the national authorities. Improvements in fishing methods have led to greater numbers, larger sizes, and increased variety of fish being caught. As a consequence fish stocks are shrinking and several species face potential extinction.

Although the countries in the region have declared a 200-mile exclusive economic zone (Law of the Sea), they lack the institutional and financial capacity to effectively monitor activities of vessels and to enforce their control over activities taking place within their jurisdictions. The lack of enforcement is contributing to the destruction of the coral reefs, to unsustainable exploitation of fisheries, and to significant damage to nontarget species, such as sea turtles, porpoises, dolphins, and whales.

Countries of the region recognize that they cannot protect their shared marine and coastal resources working alone. Rather they need to work together to improve the safety of navigation through regional waters and to enforce regulations intended to protect fishing and other marine resources from excessive exploitation. They also need assistance to pilot new technologies that have the potential of significantly improving the safety of navigation at reasonable cost, such as a marine highway. The project will help governments achieve their objectives by supporting creation of a mechanism of regional cooperation and by piloting a marine highway.

Current status of navigation systems, oil and chemical spill contingency planning, and port state control systems

Marine highway development. All the countries in the region maintain some navigational charts. However, underground seismic activity is common in the area, and charts are not updated frequently enough to show the changes. Many have been created and are being updated using technology that is now obsolete in richer parts of the world. Similarly, all countries maintain some aids to navigation. These, too, are based on outmoded technology. As a result, ships take significant precautions to avoid colliding with one another or grounding on shoals whose locations are uncertain. Countries would like to upgrade to more reliable and precision navigation systems in cooperation with the shipping industry, but will not likely be able to forge a regional agreement that would ensure all countries followed the same approach (which would lower costs to ships of installing equipment), or to be able to install a demonstration project to test its feasibility in the region.

Oil and chemical spill contingency planning. The island countries of the western Indian Ocean region are taking action to protect their marine and coastal ecosystems. Comoros, Madagascar, Mauritius, and Seychelles—with support of the GEF-financed Western Indian Ocean Oil Spill Contingency Planning Project—have prepared and tested national oil spill contingency plans and have established capacity within their ministries of environment robust capacity to respond to oil spill emergencies. They have also ratified key IMO conventions and translated their provisions into national legislation (see matrix). They have also entered into a regional oil spill contingency plan and established a regional oil spill coordination center in Madagascar that is responsible for coordinating periodic updating of the plan, regional exercises, and response to an actual emergency.

The coastal countries of southeastern Africa are also acting to safeguard their marine and coastal environments, although at different paces. Kenya has ratified the OPRC90. It prepared in July 2001 a national oil spill response contingency plan, and has capacity to address Tier 1 and Tier 2 oil spills. To coordinate response to oil spills, it has established the national oil spill response committee with representatives of the Kenya Ports Authority, the oil industry, the shipping industry, and bunkering services. The Kenya Ports Authority owns key oil spill response equipment, including a tug equipped with spraying equipment and a catamaran equipped with boom, spray arms, and several skimmers. Additional equipment is planned to be secured near future, with support of the local oil companies and the national authorities.

Port state control. Kenya, Mauritius, Mozambique, Seychelles, South Africa, and Tanzania are parties to the Indian Ocean Memorandum of Understanding for Port State Control signed on June 5, 1998. Only South Africa, however, has implemented a port state control system, which aims to verify whether foreign flag vessels calling at a port of state complies with applicable international conventions and with national laws. The other countries have yet to implement an inspection regime. Nearly all 265 inspections carried out in 2003 were carried out by SAMSAs. Mauritius carried out one inspection and the other countries carried out none. Comoros and Madagascar are not currently parties to the memorandum of understanding.

What remains to be done

Much more needs to be done to ensure that the varied habitats and rich biodiversity of the western Indian Ocean are appropriately managed and protected. Efforts now need to focus on *preventing* oil spills and ship accidents, as well as maintaining capacity to respond to them. Specifically:

National laws and regulations concerning the safety of navigation and prevention of pollution need to be coordinated across countries

While the countries bordering the western Indian Ocean engage in considerable trade with one another they have not coordinated their policies and laws to facilitate shipping and trade. Many countries have still not ratified key conventions designed to protect the marine environment from pollution accidents and to ensure the safety of navigation. Mozambique, and Tanzania have not yet ratified OPRC 90. Neither Madagascar nor Tanzania have ratified COLREG 72. Moreover, the countries that were not part of the West Indian Ocean Oil Spill Contingency Planning Project will need to translate the provisions of conventions that they ratify into local laws and regulations.

Countries of the region would benefit by joining together to adopt a harmonized system of port state control

Under a system of port state control authorities inspect foreign ships docking at their ports to ensure that they meet international safety and environmental standards, and that crew members have adequate living and working conditions. Countries in many regions of the world have forged regional agreements that commit members to inspecting ships according to international

standards, detaining ships that fail to make required improvements, and to passing information on substandard ships to its next port of call. Substandard ships pose a hazard to other ships, crew, and marine environments because they may not be able to fix their positions accurately, be under the control of incompetent officers, carelessly or illegally dispose of waste oil and other materials, and fail to maintain proper records.

Navigation equipment and services need to be upgraded in some countries

The quality of navigation equipment and navigation services varies significantly from country to country. South Africa operates a relatively sophisticated navigation system, especially concerning shipping off the southern coast, a notoriously dangerous area for boats. Other countries provide relatively rudimentary services. The existence of varying standards increases costs and risks to ships operating in the region.

Ecosystem benefits should be estimated

Parties to the FUND can collect compensation from ships that damage ecosystems from spills or accidents at sea. To use the compensation funds adequately and create incentives to encourage ships to actively prevent oil spills and other accidents, agreement on the compensation values for damage incurred is needed.

Information on risks needs to be developed

Too little is known on the risks of major pollution accidents in the region. Better information on risks would enable public and private stakeholders to focus limited resources on actions that would most cost-effectively reduce risks.

Matrix 1: Status of conventions

	MARPOL 73/78				CLC			Fund			OPRC 90	SOLAS			COLREG
	Annex I/II	Annex III	Annex IV	Annex V	Conv 69	Prot 76	Prot 92	Conv 71	Prot 76	Prot 92		Conv 74	Protocol 78	Protocol 88	
Comoros	x	x	x	x			x			x	x	x			x
Kenya	x	x	x	x	d		x	d		x	x	x			x
Madagascar							x			x	x	x			
Mauritius	x	x	x	x	d	x	x	d	x	x	x			x	x
Mozambique					d		x	d		x		x			x
Seychelles	x				d		x	d		x	x	x	x	x	x
South Africa	x	x		x	x		x			x		x	x		x
Tanzania							x			x		x			

**Annex 2: Major Related Projects Financed by the Bank and/or other Agencies
Western Indian Ocean Marine Highway Development and Coastal and Marine
Contamination Prevention Project**

<i>Sector issue</i>	<i>Project</i>	<i>Latest supervision ratings (Bank/GEF-financed projects only)</i>	
		Implementa- -tion progress (IP)	Develop- -ment objective (DO)
Bank/GEF financed			
General			
Marine/coastal pollution, biodiversity	Mozambique Coastal and Marine Biodiversity Project (35919, expected to close June 2005)	S	S
Marine/coastal pollution, fisheries management	Tanzania Marine and Coastal Environment Fisheries (88967, under preparation).		
Regional			
Protection of international waters	Western Indian Ocean Oil Spill Contingency Planning Project (36037, closed June 2004)	S	S
Protection of international waters, fisheries management	Southwest Indian Ocean Fisheries Project (P072202, under preparation)		
Protection of international waters	Malacca Straits Marine Electronic Highway Demonstration (68133, under preparation)		
Protection of international waters, fisheries management	Strategic Partnership for a Sustainable Fisheries Investment Fund in the Large Marine Ecosystems of Sub-Saharan Africa, Tranche 1 (87411, under preparation)		
Other agencies			
Protection of marine resources and regional environmental legislation	IOC Regional Environment Program		
Indian Ocean regional pollution	IOC Regional Action Project for Maritime Security		
Indian Ocean regional fisheries management	Regional Tuna Project (underway since 1985). Monitoring, inspection and surveillance, harmonizing legislation.		
Protection of International Waters	Inter-American Development Bank Environmental Protection and Maritime Transport Pollution Control in the Gulf of Honduras (under preparation)		
Protection of International Waters	UNDP Toward an Ecosystem Approach to the Sustainable Use of the Resources of the Agulhas and Somali Current Large Marine Ecosystem (under preparation)		
Protection of International Waters	IMO/GEF/UNDP Global Ballast Water Management Program		
Prevention and control of marine pollution, and safety of navigation.	IMO Integrated Technical Cooperation Program		

Annex 3: Results Framework and Monitoring
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

Results Framework

Global Environmental Objective	Outcome Indicators (classified by GEF IW M&E indicator type)	Use of Outcome Information
<p>1. To ascertain the economic, technical, and institutional feasibility of introducing precision navigation systems in the region.</p> <p>2. To support widening of the regional agreement on port state control and implementation of its provisions.</p> <p>3. To reduce risks in Kenya, Tanzania, and Mozambique of environmental damage to beaches, fishing grounds, and other domestic resources from spills of oil and chemicals.</p>	<p>1. Precision navigation system installed and its feasibility for the region assessed with the full involvement of industry groups. Should the concept prove feasible, a plan for further development is put into place (PI).</p> <p>2. Authorities responsible for monitoring the activities of large fishing vessels test the demonstration marine highway for monitoring and participate fully in assessing its feasibility (PI).</p> <p>3. Proportion of ships that do not comply with international standards arriving at ports in the region declines compared with a baseline (SRI).</p> <p>4. Government entities and industries are satisfied with the performance of the regional institute responsible for coordination of the oil spill contingency planning (PI).</p>	<p>Years 1–5: RPMU and SRPMU staff will monitor progress in implementing the project activities and work with country and regional-level implementers to understand and address problems.</p> <p>Year 3: project will be revised, based on findings of the midterm review.</p> <p>Year 5: Results will be compared with baseline data to assess the feasibility of the marine highway.</p>
Project Development Objective	Outcome Indicators	Use of Outcome Information
<p>1. To increase the safety and efficiency of navigation.</p>	<p>1. Number of ships traveling through the region using the marine highway for navigation (SRI).</p> <p>2. Number of ship inspections carried out at major ports in the region (PI).</p>	<p>Years 1–5: RPMU and SRPMU staff will monitor progress in implementing the project activities and work with country and regional-level implementers to understand and address problems.</p> <p>Year 3: project will be revised, based on findings of the midterm review.</p> <p>Year 5: Results will be compared with baseline data to assess the feasibility of the marine highway.</p>
Intermediate Results One per Component	Results Indicators for Each Component (classified by GEF IW M&E indicator type)	Use of Results Monitoring
<p>Component A: A demonstration marine highway is established and operated to demonstrate its feasibility for the region.</p>	<p>A.1. Nautical charts and publications containing information on environmental assets produced (PI).</p> <p>A.2. Charts and publications maintained and updated (PI).</p>	<p>Years 1–3: Failure to implement the activities according to the timeline may indicate a lack of capacity of the RPMU to coordinate activities.</p>

	<p>A.3. Main aids to navigation on the route of the marine highway surveyed and rehabilitated (PI).</p> <p>A.4. Automatic information service and ship reporting scheme established (PI).</p> <p>A.5. Training on search and rescue carried out (PI).</p> <p>A.6. Demonstration phase assessed (with authorities responsible for monitoring fisheries) and, if found feasible, second phase prepared (PI).</p>	<p>Year 3: project will be revised, based on findings of the midterm review.</p> <p>Year 5: Results will be compared with baseline data to assess the feasibility of the marine highway.</p>
<p>Component B: Capacity for preventing and addressing coastal and marine contamination is strengthened</p>	<p>B.1 Site-specific pollution prevention and contingency management plans developed for Kenya, Mozambique, and Tanzania (PI).</p> <p>B.2. Methodology to value ecosystem benefits developed and used by environmental managers (PI).</p> <p>B.3 Countries establish and continuously manage a regional database and geographic information system as indicated in discussions with staff of staff of project entities (PI).</p>	<p>Years 1–3: Failure to implement the activities according to the timeline may indicate a lack of capacity of the RPMU to coordinate activities.</p> <p>Year 3: project will be revised, based on findings of the midterm review.</p> <p>Year 5: Results will be compared with baseline data to assess project outcomes.</p>
<p>Component C: Capacity for regional oil and chemical spill response is widened.</p>	<p>C.2. Kenya, Mozambique, and Tanzania adopt or enhance national oil spill contingency plans (PI).</p> <p>C.2 Kenya, Mozambique, and Tanzania ratify relevant conventions and pass laws and regulations to implement them (PI).</p> <p>C.3 A regional marine pollution contingency plan that covers all participating countries is established (PI).</p> <p>C.3 The regional center established to coordinate national actions and to monitor regionwide environmental conditions is operating at the end of the project (PI).</p>	<p>Years 1–3: Failure to implement the activities according to the timeline may indicate a lack of capacity of the RPMU to coordinate activities.</p> <p>Year 3: project will be revised, based on findings of the midterm review.</p> <p>Year 5: Results will be compared with baseline data to assess project outcomes.</p>
<p>Component D: Port state control widened, and mechanisms of cooperation among related GEF-supported initiatives strengthened.</p>	<p>D.1. Agreement reached with Madagascar and Comoros to join the regional agreement on port state control, signed on June 5, 1998 (PI).</p> <p>D.2. Inspectors trained to international standards in port state control (PI).</p> <p>D.3. Mechanisms for coordination among related GEF-supported initiatives created and maintained (PI).</p>	<p>Years 1–3: Failure to implement the activities according to the timeline may indicate a lack of capacity of the RPMU to coordinate activities.</p> <p>Year 3: project will be revised, based on findings of the midterm review.</p> <p>Year 5: Results will be compared with baseline data to assess project outcomes.</p>

Arrangements for results monitoring

Outcome Indicators	Baseline	Target Values					Data Collection and Reporting		
		YR1	YR2	YR3	YR4	YR5	Frequency and Reports	Data Collection Instruments	Responsibility for Data Collection
Global Environmental Objective									
1. Precision navigation system installed and its feasibility for the region assessed with the full involvement of industry groups. Should the concept prove feasible, a plan for further development is put into place.	No marine highway infrastructure in place.	TBD	TBD	TBD	TBD	TBD	Progress with implementation reported quarterly.	TBD	RPMU
2. Authorities responsible for monitoring the activities of large fishing vessels use the demonstration marine electronic highway for monitoring and provide their feedback.	No marine highway infrastructure in place, so no authorities use it.	TBD	TBD	TBD	TBD	TBD	Number using the marine highway reported annually or semi-annually, once the demonstration project is in place.	Project implementation reports. Assessment of feasibility for scaling up the demonstration marine electronic highway.	RPMU
3. Proportion of ships with serious deficiencies declines over the course of the project.	9.27 percent in 2003.	TBD	TBD	TBD	TBD	TBD	Annually.	Indian Ocean memorandum of understanding on port state control reporting system.	RPMU and SRPMU
4. Government entities and industries are satisfied with the performance of the regional institute responsible for coordination.	Regional institute identified and functions and capacity assessed.	TBD	TBD	TBD	TBD	TBD	Annually, once the regional institute has been identified.	Feedback from government entities.	RPMU and SRPMU
Project development Objective									
1. Proportion of oil tankers traveling through the region using the demonstration marine electronic highway for navigation.	No marine highway infrastructure in place, so no ships use it.	TBD	TBD	TBD	TBD	TBD	Annually or semi-annually, once the demonstration project is in place.	Project implementation reports. Assessment of feasibility for scaling up the demonstration marine electronic highway.	RPMU
2. Number of ship	265 in 2003	TBD	TBD	TBD	TBD	TBD	Annually	Indian Ocean memorandum	RPMU

inspections carried out at major ports in the region.								of understanding reporting system.	
Results Indicators for Each Component									
A.1. Nautical charts and publications produced.	TBD	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU
A.2. Charts and publications maintained and updated.	TBD	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU
A.3. Main aids to navigation on the route of the marine highway surveyed and rehabilitated.	TBD	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU
A.4. Automatic information service and ship reporting scheme established.	TBD	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU
A.5. Training on search and rescue carried out.	TBD	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU
A.6. Demonstration phase assessed and, if found feasible, second phase prepared.	TBD	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU
B.1. Site-specific pollution prevention and contingency management plans developed for Kenya, Mozambique, and Tanzania.	Limited capacity in place.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
B.2. Methodology to value ecosystem benefits developed and used by countries.									
B.3 Countries establish and continuously manage a regional database and geographic information system as indicated in discussions with staff of staff of project entities.	TBD	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
C.1 Kenya, Mozambique, and Tanzania adopt national oil spill contingency plans.	Not in place.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU

C.2 Kenya, Mozambique, and Tanzania ratify relevant conventions and pass laws and regulations to implement them.	Conventions not currently ratified.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
C.3 A regional marine pollution contingency plan that covers all participating countries is established.	Neither Kenya, Mozambique, nor Tanzania currently in the regional plan.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
C.4 A regional center to coordinate national actions and to monitor regionwide environmental conditions is fully operating by the end of the project	Regional center is currently operating in Madagascar.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
D.1. Agreement reached with Madagascar and Comoros to join the regional agreement on port state control that was signed on June 5, 1998.	Madagascar and Comoros not currently part of the regional agreement.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
D.2. Inspectors trained to international standards in port state control.	No inspectors currently trained.	TBD	TBD	TBD	TBD	TBD	Annually	Project implementation reports.	RPMU and SRPMU
D.3. Mechanisms for coordination among related GEF-supported initiatives created and maintained.	No mechanisms are yet in place.	TBD	TBD	TBD	TBD	TBD	Quarterly	Project implementation reports.	RPMU and SRPMU

Annex 4: Detailed Project Description

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

The project will include Kenya, Mozambique, South Africa, Tanzania, Madagascar, Comoros, Mauritius and Seychelles, and as a partner La Réunion (France), covering a combined coastline of 13,300 kilometers.

By adapting the model developed for the proposed GEF-supported marine electronic highway project for the Straits of Malacca and Singapore, the development of the western Indian Ocean marine highway will be implemented in phases. The first phase of the project will establish as a pilot a marine highway with electronic support for a limited area of the region's major shipping routes, will assess the feasibility of the concept, and, should the concept prove viable, will finance preparation of a follow-up project agreed upon by the countries. The second phase of the project (five years or so after the start of project preparation) will build on the experience of the first phase and establish a full marine highway covering all major shipping routes of the western Indian Ocean region.

The precise components, activities, and implementation arrangements of the project have been defined through a study undertaken with support from a GEF/PDF Block B Grant, which was requested in July 2003, approved in November 2003 and made effective in July 2004 after signing of the agreement by all recipient countries. GEF funds will complement technical assistance provided through the other partners in the program, and will finance only activities that contribute to global environmental benefits, and that others cannot finance. Specifically, GEF funds will finance activities designed to prevent marine and coastal contamination activities and activities that support surveillance and enforcement of laws and regulation governing the shipping and fisheries industries. This includes development and installation of a pilot marine highway. The oil spill contingency planning activities are largely baseline activities, and the GEF will allocate limited funding for these, focusing on the activities designed to create the regional plan and strengthen regional collaboration.

All data collection, studies, and research planned under the proposed Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project are targeted and specific to the project and will not duplicate activities which are planned under other GEF-funded initiatives under the programmatic umbrella for the western Indian Ocean. The proposed project will not, for example, support development and implementation of a fisheries management plan, undertake a broader resource assessment of the large marine ecosystem, study human impact on coral reefs, or the like.

Components include:

Component A: Regional marine highway development – US\$13.9 million

A marine highway takes advantage of advances in technology that improve the navigational decisionmaking of mariners. It involves an integrated system of electronic nautical charts, continuous real-time positioning information, aids to navigation and shore-based automatic ship

identification system, transponders, and provision of real-time meteorological, oceanographic, environmental, weather, and navigational information. Shipmasters use the information to guide their ships safely through busy shipping lanes. Shore-based authorities use the information to precisely identify and track ships. The marine highway is thus a valuable tool for preventing and controlling marine pollution, monitoring and controlling ship movements in and around environmentally sensitive areas, and ensuring the safety of navigation. It may potentially also be used as a valuable tool for monitoring fishing activities and for enforcing regulations and international agreements intended to ensure sustainable management of fisheries and of other marine and coastal resources. A marine highway lowers costs of shipping by reducing the risk of accidents and by allowing ships to operate in storms and other adverse conditions that would idle them if they relied on conventional navigational systems.

The concept of a marine highway was initiated in Canada in the early 1990s with the application of digital technology to navigation, particularly in the development of electronic navigational charts and the electronic chart display and information system (ECDIS). The core of the Canadian version of the marine highway was the integration and interconnection of the ECDIS and the automatic identification system with powerful shore-based databases to provide a basis for optimizing management of shipping traffic. The ECDIS has been operating in the Great Lakes and the St. Lawrence River corridor since 1995 with considerable success, helping ships to navigate through treacherous waters even in conditions of low visibility. The pioneering efforts in Canada on digital navigation had led to the widespread adoption of electronic navigational charts and the ECDIS by the world's shipping industry, accelerating the commercial development of electronic maritime technology along with international technology standards.

More important than technology, the marine highway requires institutional mechanisms that bring governments and public and private actors together to cooperate and coordinate their actions. It also involves financial, legal, and institutional arrangements that ensure it is managed, operated, and updated efficiently and effectively.

The first phase of the project will involve the establishment of a network of electronic navigational charts in conjunction with the differential global positioning system and other maritime technologies, which will form the backbone of a marine highway extending from South Africa to the Mozambican port of Nacala (west of Comoros) to Aldabra (Seychelles). Vessels using this route will come under the control of the electronically supported segments of the marine highway in South Africa, again at Inharrime (Mozambique), and again at Nacala, and then again at Aldabra until leaving the marine highway. As the area between these two points is in deepwater and is far from the coasts, the area will be surveyed and electronic charts will be provided to the vessels. In addition, the route north from the Seychelles will be surveyed to provide mariners with up to date information on how to navigate the route safely after they leave the marine highway.

It is expected that the large vessels transporting oil and chemicals will choose to sail under the control of the marine highway, rather than outside its boundaries, because doing so will reduce their risks of groundings and collisions and increase their efficiency of navigation. The technology of the marine highway may also be useful for monitoring, control, and surveillance of large fishing vessels. All countries of the region either already require or are planning to require

fishing vessels that operate in their territorial waters to install and operate an automated satellite-linked vessel monitoring system on their ships. Vessel monitoring systems provide information to the fishing authorities on the location of a vessel, speed, and course of a vessel. They allow the authorities to check whether the vessel operates where fishing is not allowed, holds the necessary licenses and quotas to fish in the area, or has sailed to a port without declaring its landings. The proposed project will collaborate with the national fishing authorities to ensure that the technology of the marine highway is as useful as possible to monitor and control fishing activities. Where fishing boats are not already using a vessel monitoring system, mechanisms to hasten their adoption—such as requiring them to install the necessary equipment on their boats (provided at no cost by the project) in exchange for a license—will be explored with the fishing authorities. The evaluation of the demonstration project will include an in-depth study of the costs and benefits to large fishing vessels of using a marine highway, and will specify a range of regulatory and other measures that would encourage such vessels to use it.

Specific activities include:

- (a) **GENERATING NAUTICAL CHARTS AND PUBLICATIONS.** The major routes used by vessels will be surveyed using swath bathymetry equipment to identify potential dangers on the routes and to provide data to be used to produce both paper and digital charts. In addition, the approaches to and sites of nine ports (five in Mozambique, two in Kenya and two in Tanzania) will be surveyed and the relevant paper and digital charts produced and regularly updated. The charts and publications will include information on the environmental conditions and biological resources of the region's waters, including nurseries, major fish migration routes, and environmentally-sensitive areas.
- (b) **MAINTAINING CHARTS AND PUBLICATIONS.** Experts in the production of surveys and charts will provide training in managing and maintaining information necessary to ensure the safety of navigation and environmental protection. Special attention will be taken to ensure that information on fish stocks and other biological resources is incorporated into the charts and publications.
- (c) **INSTALLING AIDS TO NAVIGATION.** Surveys of hazards and assessments of the status of the lights and buoys will be carried out in along all the major shipping routes, with particular emphasis on the route to be used for the demonstration phase of the marine highway. In addition, aids to navigation will be installed to guide ships traveling through the waters of the western Indian Ocean and entering ports and harbors. GEF financing of US\$1.1 million will support installation of the aids to navigation.
- (d) **INSTALLING AUTOMATIC INFORMATION SYSTEMS, A SHIP REPORTING SCHEME, AND A DIFFERENTIAL GLOBAL POSITIONING SYSTEM SERVICE.** The project will support the installation of six shore-based automatic information systems (several in South Africa (including Durban), three in the Inharrime area, and three in the Nacala area, and three in the area of the Seychelles), and an automatic information systems center in Maputo. Should a comparable satellite automatic information system become available while the project is being implemented, the benefits of this system compared with that of terrestrial stations will be evaluated. This subcomponent will support installation of equipment

(financed by the industry) on ships taking part in the demonstration project, which together will form the basis of a ship reporting scheme. The subcomponent will also support training in the operation and maintenance of the systems. The installations will be used to transmit real time information on hydrographical and oceanographic, environmental, weather conditions, and the positions and movements of ships in the area. They will form the foundation of a marine highway that will fully integrate information required for marine safety and environmental protection and management, including management of fisheries.

- (e) **STRENGTHENING SEARCH AND RESCUE OPERATIONS.** This subcomponent will support the installation of the telecommunication link between the marine rescue coordination centers in South Africa and in Kenya. No GEF financing will be used for this subcomponent.
- (f) **EVALUATING THE PILOT PHASE AND PREPARING THE NEXT PHASE.** This subcomponent will finance a detailed assessment of the pilot phase and draw lessons for use in designing and rolling out the second phase of the marine highway development. The evaluation of the demonstration project will include an in-depth study of the costs and benefits to large fishing vessels of using a marine highway, and will specify a range of regulatory and other measures that would encourage such vessels to use it. This subcomponent will also finance the detailed preparation of the second phase of the marine highway development.

The GEF would finance each of these subcomponents except for search and rescue, with resources focused in particular on producing the nautical charts and publications, and on evaluating the demonstration phase and preparing the second phase. DANIDA, the UKHO, IHO, IMO, INTERTANKO and SHOM are expected to support, contribute to, or cofinance the activities.

Component B: Coastal and marine contamination prevention capacity building – US\$3.9 million

Subcomponents include:

- (a) **SUPPORTING SEMINARS AND WORKSHOPS.** This subcomponent will support seminars and workshops on environmental sensitivity mapping, project management, issues related to implementation of conventions, marine navigation safety, prevention of marine and coastal pollution, development and implementation of national contingency plans, use of oil spill equipment, characteristics and effects of oil in the marine environment, risk assessment and development of appropriate response strategies. It will also finance the participation of government officials at major international seminars on the safety of marine navigation, prevention of ship-based pollution, enforcing fisheries regulations, and related matters. It will support experts to test an oil spill response manual. Finally, it will support the training of trainers.
- (b) **CREATING SITE-SPECIFIC POLLUTION PREVENTION AND CONTINGENCY MANAGEMENT PLANS FOR COASTAL AND MARINE BIODIVERSITY HOTSPOTS WITH HIGH RISK PROFILES.** This subcomponent will support the training both locally and abroad of country experts on international maritime laws. Sensitivity maps in combination with the risk assessment will be used to identify coastal and marine biodiversity hotspots which are at high risk of pollution and damage from shipping accidents. Site-specific and issue-related pollution

- (c) **DEVELOPING A METHODOLOGY TO VALUE ECOSYSTEM BENEFITS.** This subcomponent will support the development of a methodology to enable governments to carry out baseline studies to identify the key environmental resources of the region and assign indicative values to the resources. Important resources include coral reefs, calving areas of marine mammals, nurseries of various fish species, and the like. The methodology will draw on information on biological resources generated through the UNDP-executed Western Indian Ocean Large Marine Ecosystem Project (WIO MEP) and the World Bank-executed Southwest Indian Ocean Fisheries Project (SWIOFP). Those projects in turn will benefit from the methodology in developing the strategic action programs.
- (d) **DEVELOPING A REGIONAL DATABASE AND GEOGRAPHIC INFORMATION SYSTEM ON MARINE AND COASTAL RESOURCES.** The project will finance the development of a regional database and geographic information system on the marine environment, marine and coastal resources, ship movements, ship waste, and sea-based activities. Activities will include collection of baseline data where necessary. The information, together with that generated under the WIO MEP and the SWIOFP, will be used to create sensitivity maps indicating coastal and marine resources and their economic values and sea-based sources of marine pollution. The database will be useful in developing the strategic action programs for the Agulhas and Somali large marine ecosystems.

The GEF would contribute to financing each of these subcomponents. GEF funds in particular would support the development of a methodology to value ecosystem benefits and the development of a regional database and geographical information system on marine and coastal resources. The IMO, IPIECA, the EC, and France have expressed interest in contributing to or cofinancing the preparation of the national oil spill contingency plans.

Component C: Widening the regional oil spill contingency capacity – US\$4.0 million

- (a) **ASSISTING KENYA, MOZAMBIQUE, AND TANZANIA TO DEVELOP NATIONAL OIL SPILL CONTINGENCY PLANS, TO JOIN THE REGIONAL PLAN, AND TO CREATE SENSITIVITY MAPS.** Mozambique, Tanzania, and Kenya have yet to develop or complete national oil spill contingency plans, as they are encouraged to do under the Nairobi Convention. This component will help them to do so, building on the work already undertaken by the IMO and drawing upon the expertise that has been developed under the West Indian Ocean Oil Spill Contingency Planning Project. It will also support (under the Nairobi Convention) activities to join the regional plan prepared under the previous project that provides a framework for the countries of the region to cooperate and to provide mutual assistance in the event of an oil spill. Finally, this component will support the development of marine ecosystem sensitivity maps that will be used to identify areas of special significance that may require especially high levels of protection. The sensitivity maps

- (b) **SUPPORTING COUNTRIES' EFFORTS TO RATIFY IMO CONVENTIONS AND TRANSLATE THEM INTO NATIONAL LEGISLATION.** The project will help countries identify and overcome obstacles to ratifying IMO conventions intended to protect the marine and coastal environment from pollution from ships and to improve the safety of navigation. It will help countries to draft national legislation where necessary to harmonize national laws with the provisions of the conventions. Finally, it will support formulation of action plans with the steps and timetable to improve implementation of the conventions. This will help countries handle the complex technical requirements of the conventions. Because countries that were included in the West Indian Ocean Oil Spill Contingency Planning Project have already ratified most of the key conventions and taken the steps needed to implement them, Kenya, Mozambique, and Tanzania will be the primary beneficiaries of this component.
- (c) **FACILITATING REGIONAL AGREEMENTS AND DEVELOPMENT OF A REGIONAL CONTINGENCY PLAN.** The project will facilitate the establishment of regional cooperation agreements between the participating countries on prevention of transboundary marine pollution, safety of marine navigation, oil spill response, and sharing of information. This activity will also support the preparation of a regional marine pollution contingency plan.
- (d) **STRENGTHENING A REGIONAL CENTER.** A regional body will be needed to coordinate national actions, to monitor region-wide environmental conditions and causes of degradation and damage, and to eventually operate the marine highway. Such a body will be critically important to coordinate multicountry activities beyond the lifetime of the project and will thus support its sustainability. The project through technical assistance and training will strengthen an appropriate organization, which is likely to be based on or linked to the regional body created under the oil spill contingency planning project. The regional center will be building on the regional coordination center that has been established in Madagascar under the earlier western Indian Ocean oil spill contingency planning project.

The GEF would contribute in financing each of the subcomponents, except the strengthening the regional center. It would focus in particular on assisting countries to ratify conventions and to enact the enabling legislation and on developing national oil spill contingency plans. The IMO, IPIECA, the EC, and France are expected to contribute to or to cofinance the activities.

Component D: Port state control and regional institutional strengthening and project management – US\$3.7 million

- (a) **SUPPORTING ADOPTION OF PORT STATE CONTROL.** Port state control allows countries to require that ships entering their ports meet the requirements of the major conventions of the IMO on the safety of navigation and the prevention of pollution from ships regardless of whether or not the flag state is party to the conventions. Port state control also helps to make the operations of illegal, unreported, unregulated fishing fleet unprofitable by

eliminating opportunities to land and sell fish that have been harvested in violation of the law. A regional port state control arrangement provides an effective tool to ensure that ships using international navigation routes and calling on major ports in a region comply with the rules and standards set out in the applicable IMO conventions. A memorandum of understanding for port state control in the Indian Ocean was signed on June 5, 1998, by Australia, Bangladesh, Djibouti, Eritrea, India, Iran, Kenya, Maldives, Mauritius, Mozambique, Myanmar, Seychelles, South Africa, Sri Lanka, Sudan, Tanzania and Yemen. This component will support the widening of this regional agreement on port state control to Madagascar and Comoros. Based on the work undertaken or envisaged by the IMO, this component will also support its implementation in countries participating in the project, covering issues such as procedures for surveillance, inspection, and detention of ships, and arrangements for exchanging information. It will also support capacity building, including training of inspectors to international standards in port state control.

- (b) **STRENGTHENING COUNTRIES CAPACITY TO MEET THE OBLIGATIONS OF CONVENTIONS.** This subcomponent will support several regional seminars and workshops on topics related to the ratification of the IMO conventions and to development or upgrading of the national legal framework to take account of relevant conventions' provisions. Seminars will also cover issues of maritime traffic management and pollution prevention, and measures to protect coastal and marine biological resources. Regional workshops will also be held aimed at developing consensus among countries on priority actions, administrative arrangements, and coordination mechanisms to be used in promoting regional marine environmental management.
- (c) **SUPPORTING PROJECT COORDINATION AND MANAGEMENT.** Assistance will be needed at the regional, subregional, and national levels to manage the project and coordinate the various activities. This component will finance equipment, staff, and logistical support required by the regional body, a subregional entity, and national institutions to ensure that the project is implemented efficiently and to build sustainable capacity of the participating entities to manage the development of the marine highway and to coordinate activities after the project is completed. It will also strengthen the technical capabilities and the institutional and coordinating arrangements among the concerned states to collectively prevent, manage, and respond to transboundary marine pollution. This component will support technical assistance and studies as needed during project implementation. It will support creation of capacity for monitoring key performance indicators and for evaluating project implementation progress and impact. This component will also support the establishment of mechanisms for sustainable financing of the development of the marine highway and other infrastructure and capacity created through the project. A key element of the project is its commitment to coordinate and collaborate with other projects in the region that are working to protect the marine and coastal environment. This component will support activities to facilitate such coordination and collaboration, such as establishing and maintaining a list-serve for people interested in the issues, providing updates on project progress to the International Waters-Learn website, hosting regional workshops, and the like.

- (d) DEVELOPING MECHANISMS FOR SUSTAINABLE FINANCING AND OTHER ACTIVITIES. The project will build on the successful experiences of the Western Indian Ocean Oil Spill Contingency Project to develop mechanisms for the sustainable financing of both the marine highway development, and environmental information systems to ensure that the benefits of the project are sustainable. The private shipping industry is expected to contribute significantly to the costs, because it will benefit from the increased efficiency and safety of navigation. In addition, this subcomponent will support ad hoc technical assistance and studies during project implementation.

The GEF funds would support each of the subcomponents. GEF funds would support widening the existing regional agreement on port state control to include Madagascar and Comoros. They would also support project coordination and management and activities aimed at developing and maintaining linkages among related GEF projects.

Annex 5: Project Costs
Western Indian Ocean Marine Highway Development and Coastal And Marine Contamination Prevention Project

Annex 5
 Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table A
Components Project Cost Summary

<u>Project Components</u>	(US\$ Million)				% Total
	Local	Foreign	Total	Foreign Exchange	
A. Regional Marine Highway development	1.7	10.1	11.9	85.0	54.0
B. Coastal and Marine Contamination Prevention	0.6	2.8	3.4	82.0	16.0
C. Widening the oil spill response capacity in the r	0.3	3.1	3.4	92.0	16.0
D. Regional institutional strengthening & project n	1.6	1.5	3.1	49.0	14.0
Total BASELINE COSTS	4.2	17.6	21.8	77.0	101.0
Physical Contingencies	0.3	1.3	1.6	79.0	7.0
Price Contingencies	0.5	1.6	2.1	77.0	10.0
Total PROJECT COSTS	5.0	20.4	25.4	80.0	117.0

Note: Figures may not add up to total due to rounding

Annex 5
Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table B
Components Project Cost Summary

<u>Project Components</u>	(US\$ Million)				
	Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Regional Marine Highway development					
1. Nautical Charts and Publications	0.5	3.7	4.2	88.0	19.0
2. Charts and publication Maintenance	0.2	0.9	1.0	85.0	5.0
3. Aids to Navigation	0.1	0.8	1.0	85.0	5.0
4. Automatic Information Service (AIS) & Ship Reporting Scheme	0.9	4.2	5.1	83.0	23.0
5. Search and Rescue	0.0	0.1	0.1	85.0	0.0
6. Evaluation of the Demonstration Phase and Preparation of Phase 2	0.1	0.4	0.4	85.0	2.0
Subtotal Regional Marine Highway development	1.7	10.1	11.9	85.0	54.0
B. Coastal and Marine Contamination Prevention capacity building					
1. Seminars, Workshops and Training on coastal and marine protection	0.3	0.8	1.0	75.0	5.0
2. External expertise & equipment	0.2	1.2	1.4	85.0	6.0
3. Valuing Ecosystems benefits methodology	0.1	0.4	0.5	85.0	2.0
4. Regional Database on marine and coastal resources preparation	0.1	0.4	0.5	85.0	2.0
Subtotal Coastal and Marine Contamination Prevention capacity building	0.6	2.8	3.4	82.0	16.0
C. Widening the oil spill response capacity in the region					
1. Conventions Ratifications	0.0	0.2	0.2	100.0	1.0
2. National oil spill contingency plans development (NCP)	0.1	0.6	0.8	81.0	4.0
3. Oil spill response equipment	0.0	2.1	2.1	98.0	10.0
4. Regional Agreements and Regional Contingency Plan	0.1	0.2	0.3	73.0	1.0
Subtotal Widening the oil spill response capacity in the region	0.3	3.1	3.4	92.0	16.0
D. Regional institutional strengthening & project management					
1. Regional Agreement on Port State Control initiative	0.0	0.3	0.3	85.0	1.0
2. Support to convention compliance in the region	0.0	0.2	0.2	85.0	1.0
3. Assistance for project coordination and Management	1.5	1.1	2.6	43.0	12.0
Subtotal Regional institutional strengthening & project management	1.6	1.5	3.1	49.0	14.0
Total BASELINE COSTS	4.2	17.6	21.8	77.0	101.0
Physical Contingencies	0.3	1.3	1.6	79.0	7.0
Price Contingencies	0.5	1.6	2.1	77.0	10.0
Total PROJECT COSTS	5.0	20.4	25.4	80.0	117.0

Note: Figures may not add up to total due to rounding

Annex 5
Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table C

Components Project Cost Summary

	(ZAR Million)			(US\$ Million)			% Foreign Exchange	% Total Base Costs
	Local	Foreign	Total	Local	Foreign	Total		
A. Regional Marine Highway development								
1. Nautical Charts and Publications	3.2	24.1	27.3	0.5	3.7	4.2	88	19
2. Charts and publication Maintenance	1.0	5.8	6.8	0.2	0.9	1.0	85	5
3. Aids to Navigation	1.0	5.4	6.4	0.1	0.8	1.0	85	5
4. Automatic Information Service (AIS) & Ship Reporting Scheme	5.6	27.6	33.2	0.9	4.2	5.1	83	23
5. Search and Rescue	0.1	0.6	0.7	0.0	0.1	0.1	85	0
6. Evaluation of the Demonstration Phase and Preparation of Phase 2	0.4	2.3	2.8	0.1	0.4	0.4	85	2
Subtotal Regional Marine Highway development	11.3	65.8	77.1	1.7	10.1	11.9	85	55
B. Coastal and Marine Contamination Prevention capacity building								
1. Seminars, Workshops and Training on coastal and marine protection	1.6	4.9	6.5	0.3	0.8	1.0	75	5
2. External expertise & equipment	1.4	7.7	9.1	0.2	1.2	1.4	85	6
3. Valuing Ecosystems benefits methodology	0.5	2.8	3.3	0.1	0.4	0.5	85	2
4. Regional Database on marine and coastal resources preparation	0.5	2.8	3.3	0.1	0.4	0.5	85	2
Subtotal Coastal and Marine Contamination Prevention capacity building	4.0	18.1	22.1	0.6	2.8	3.4	82	16
C. Widening the oil spill response capacity in the region								
1. Conventions Ratifications	0.0	1.5	1.5	0.0	0.2	0.2	100	1
2. National oil spill contingency plans development (NCP)	1.0	4.0	5.0	0.1	0.6	0.8	81	4
3. Oil spill response equipment	0.3	13.5	13.8	0.0	2.1	2.1	98	10
4. Regional Agreements and Regional Contingency Plan	0.4	1.2	1.6	0.1	0.2	0.3	73	1
Subtotal Widening the oil spill response capacity in the region	1.7	20.3	21.9	0.3	3.1	3.4	92	16
D. Regional institutional strengthening & project management								
1. Regional Agreement on Port State Control initiative	0.3	1.7	2.0	0.0	0.3	0.3	85	1
2. Support to convention compliance in the region	0.2	1.1	1.3	0.0	0.2	0.2	85	1
3. Assistance for project coordination and Management	9.8	7.3	17.1	1.5	1.1	2.6	43	12
Subtotal Regional institutional strengthening & project management	10.3	10.0	20.3	1.6	1.5	3.1	49	14
Total BASELINE COSTS	27.2	114.3	141.5	4.2	17.6	21.8	77	101
Physical Contingencies	2.1	8.2	10.4	0.3	1.3	1.6	79	7
Price Contingencies	3.1	10.3	13.5	0.5	1.6	2.1	77	10
Total PROJECT COSTS	32.5	132.9	165.3	5.0	20.4	25.4	80	117

Note: Figures may not add up to total due to rounding

Annex 5

Western Indian Ocean

Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table D

Project Components by Year -- Totals Including Contingencies
(US\$ Million)

	Totals Including Contingencies					Total
	2006	2007	2008	2009	2010	
A. Regional Marine Highway development						
1. Nautical Charts and Publications	0.0	1.3	2.3	1.4	-	5.0
2. Charts and publication Maintenance	0.0	0.4	0.4	0.3	0.1	1.2
3. Aids to Navigation	0.0	-	-	0.6	0.6	1.2
4. Automatic Information Service (AIS) & Ship Reporting Scheme	0.6	-	-	5.1	0.2	5.8
5. Search and Rescue	0.0	0.1	0.0	-	-	0.1
6. Evaluation of the Demonstration Phase and Preparation of Phase 2	-	-	-	0.1	0.4	0.5
Subtotal Regional Marine Highway development	0.7	1.8	2.8	7.4	1.3	13.9
B. Coastal and Marine Contamination Prevention capacity building						
1. Seminars, Workshops and Training on coastal and marine protection	-	0.4	0.4	0.4	-	1.2
2. External expertise & equipment	-	0.1	0.1	1.3	-	1.6
3. Valuing Ecosystems benefits methodology	0.1	0.2	0.2	-	-	0.6
4. Regional Database on marine and coastal resources preparation	-	0.3	0.2	-	-	0.6
Subtotal Coastal and Marine Contamination Prevention capacity building	0.1	1.1	1.0	1.7	-	3.9
C. Widening the oil spill response capacity in the region						
1. Conventions Ratifications	-	0.3	-	-	-	0.3
2. National oil spill contingency plans development (NCP)	0.0	0.4	0.1	0.3	0.0	0.9
3. Oil spill response equipment	-	-	0.1	2.3	0.0	2.5
4. Regional Agreements and Regional Contingency Plan	-	-	-	0.3	-	0.3
Subtotal Widening the oil spill response capacity in the region	0.0	0.7	0.3	3.0	0.1	4.0
D. Regional institutional strengthening & project management						
1. Regional Agreement on Port State Control initiative	-	0.2	0.2	-	-	0.3
2. Support to convention compliance in the region	-	-	0.2	-	-	0.2
3. Assistance for project coordination and Management	0.8	0.7	0.7	0.6	0.2	3.1
Subtotal Regional institutional strengthening & project management	0.8	0.9	1.1	0.6	0.2	3.7
Total PROJECT COSTS	1.6	4.4	5.2	12.7	1.5	25.4

Note: Figures may not add up to total due to rounding

Annex 5
Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project
 Table E
Components by Financiers - Totals Including Contingencies
 (US\$ Million)

	Western Indian Ocean							
	GEF		Ocean Governments		Identified Financing		Total	
	Amount	%	Amount	%	Amount	%	Amount	%
A. Regional Marine Highway development								
1. Nautical Charts and Publications	3.5	69.6	0.0	0.0	1.5	30.4	5.0	27
2. Charts and publication Maintenance	0.9	71.1	0.0	0.0	0.4	28.9	1.2	1
3. Aids to Navigation	0.6	51.1	0.0	0.0	0.6	48.9	1.2	6
4. Automatic Information Service (AIS) & Ship Reporting Scheme	1.7	28.8	0.0	0.0	4.1	71.2	5.8	12
5. Search and Rescue	0.1	100.0	0.0	0.0	-0.0	-0.0	0.1	0
6. Evaluation of the Demonstration Phase and Preparation of Phase 2	0.4	75.0	0.0	0.0	0.1	25.0	0.5	2
Subtotal Regional Marine Highway development	7.2	51.5	0.0	0.0	6.7	48.5	13.9	49
B. Coastal and Marine Contamination Prevention capacity building								
1. Seminars, Workshops and Training on coastal and marine protection	-	-	0.0	0.0	1.2	100.0	1.2	27
2. External expertise & equipment	-	-	-0.0	-0.0	1.6	100.0	1.6	1
3. Valuing Ecosystems benefits methodology	0.3	50.0	0.0	0.0	0.3	50.0	0.6	6
4. Regional Database on marine and coastal resources preparation	0.3	50.0	0.0	0.0	0.3	50.0	0.6	12
Subtotal Coastal and Marine Contamination Prevention capacity building	0.6	14.9	-0.0	-0.0	3.3	85.1	3.9	20
C. Widening the oil spill response capacity in the region								
1. Conventions Ratiications	0.2	80.0	-0.0	-0.0	0.1	20.0	0.3	27
2. National oil spill contingency plans development (NCP)	0.2	26.2	0.1	6.1	0.6	67.7	0.9	1
3. Oil spill response equipment	-	-	0.1	3.2	2.4	96.8	2.5	6
4. Regional Agreements and Regional Contingency Plan	0.2	70.0	0.0	0.0	0.1	30.0	0.3	6
Subtotal Widening the oil spill response capacity in the region	0.7	16.8	0.1	3.4	3.2	79.8	4.0	18
D. Regional institutional strengthening & project management								
1. Regional Agreement on Port State Control initiative	0.2	50.0	0.0	0.0	0.2	50.0	0.3	27
2. Support to convention compliance in the region	0.1	50.0	0.0	10.0	0.1	40.0	0.2	1
3. Assistance for project coordination and Management	2.4	76.2	0.7	22.0	0.1	1.9	3.1	6
Subtotal Regional institutional strengthening & project management	2.6	72.2	0.7	19.3	0.3	8.6	3.7	13
Total Disbursement	11.0	43.4	0.8	3.3	13.5	53.3	25.4	100

Note: Figures may not add up to total due to rounding

Annex 6: Implementation Arrangements

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

Partnership arrangements

The project will be implemented in partnership with multilateral organizations, with industry groups representing both the shipping and oil industries, and with donors. Specialized international organizations, including IALA, the IHO, IMO, the UKHO, and SHOM will be close partners in preventing marine contamination and in developing the national and the regional oil spill response contingency plans. UNEP through its Regional Seas Program will be a partner in protecting critical habitats and biodiversity. UNDP will be a partner in assessing risks to the ecosystem of the western Indian Ocean. The oil industry (IPIECA) and the shipping industry (INTERTANKO and ITOPF) are likely to provide expert advice and technical support to the project. France has expressed interest in participating as a partner through La Réunion island. Both the EC and the Danish International Development Agency (DANIDA) have expressed interest in providing support for project activities.

Implementation arrangements

Project implementation period. The project will be implemented during fiscal 2006–10, completed by June 30, 2009 and closed by December 31, 2009.

Executing agencies. Given the technical nature of some aspects of the project and the large number of countries involved, several options are being considered for project management. One is to appoint a regional project management unit (RPMU) headed by a regional coordinator to be responsible for implementing component A (development of a regional marine highway), component D (port state control and regional institutional strengthening), and for overall coordination of project implementation. The RPMU will also be accountable for ensuring that financial reporting and auditing requirements are met and that procurement, disbursement, and financial management policies and procedures are complied with. The South African Maritime Safety Authority (SAMSA) is being considered as a suitable organization to serve as the RPMU. Establishing a subregional project management unit (SRPMU) at the Indian Ocean Commission (IOC) is also being considered to implement project components B (capacity building for prevention of marine and coastal contamination) and C (widening oil and chemical spill response capacity). Project implementation coordinators from the ministry of transport of each country will coordinate implementation of the national-level activities and all beneficiary agencies. The project will help build the capacity of the RPMU, the SRPMU, and the PICs for project management and project monitoring.

Project oversight. A steering committee—comprising senior officials responsible for transport or the environment or both of each of the beneficiary countries, the Chief Executive Officer of SAMSA and the Secretary General of the IOC—will be responsible for the overall monitoring of project implementation. .

Supervision. The Bank will devote some 100 staff weeks to supervise progress under the GEF grant through fiscal 2010. Supervision will focus on progress in achieving specific objectives, such as establishing the marine highway, ratification of conventions, development of the national and regional contingency plans, progress with widening and implementing the regional agreement on port state control, procurement, financial management, and overall project implementation. During supervision and project reviews, particular attention will be paid to implementation of the mechanisms designed to promote institutional and financial sustainability.

Annex 7: Financial Management and Disbursement Arrangements
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

Accounting, financial reporting and auditing arrangements. The RPMU and the SRPMU will establish before September 30, 2005 project accounting systems tracking the cost of the various goods and services provided under the project, according to the most recent World Bank Financial Management Guidelines published by the World Bank. They will keep separate project accounts together with their statutory financial statements. Terms of reference for annual audits of project accounts and semiannual audits of the statement of expenditures will be agreed upon at negotiations. Auditing will be carried out by independent auditors acceptable to the Bank, and the reports of such audits will be submitted to the Bank no later than six months after the end of the fiscal years of the RPMU and SRPMU for the project accounts and no later than three months after the end of each calendar semester for the statements of expenditure.

The summary of the financial management assessment will be completed during appraisal. This will include the arrangements for oversight and accountability; the status of project financial management including any financial management risks inherent in the project; the planned actions and target dates for financial management improvements and the related effectiveness conditions and dated covenants designed to reduce those risks; the project's readiness for implementation; and the next steps needed; and the means by which the project's financial management is to be monitored.

Disbursement Arrangements

The total estimated disbursements, including all sources of financing over the project life are summarized in table A below. The total funds proceeds would be disbursed over five years. The GEF/Bank grant disbursements will cover the following percentages indicated below:

Works: (US\$ 3.4 million): 31% of total expenditures.
Equipment, goods, and materials: (US\$ 1.8 million): 17% of total expenditures.
Expertise and consultants' services (US\$3.4 million): 30% of total expenditures.
Training (US\$1.4 million): 12% of total expenditures.
Operating costs (US\$0.2 million): 2% of total expenditures

Closing date. The closing date is December 31, 2009, six months after completion of project execution (June 30, 2009).

Minimum disbursements. The minimum application amount for payments directly from the grant account or for issuance of Special commitments will be US\$xxxxx equivalent (to be confirmed during negotiations). Disbursements will be fully documented except that withdrawals will be made on the basis of statements of expenses (SOEs) for the items below:

- (a) Works valued at less than US\$xxxx equivalent;
- (b) Equipment, goods and materials valued at less than US\$xxxx equivalent;

- (c) Expertise and consultants' services and training contracts valued at less than US\$100,000 equivalent, and individual consultant contracts valued at less than US\$50,000 equivalent;
- (d) Travel and subsistence expenditures for training, seminars, workshops and external experts provided to the project by the partners valued at less than US\$ 10,000 equivalent per individual.

Special Accounts. If requested by SAMSA and the IOC, and to facilitate disbursements against eligible expenditures for small contracts not exceeding US\$xxx equivalent, two Special Accounts (A and B), will be established in the name of SAMSA (A) and the IOC (B). The Special Accounts will be opened and maintained in a commercial bank, acceptable to the Bank, with an authorized allocation of US\$500,000, corresponding to about four months of expenditures. Replenishment application will be submitted at monthly intervals and will include reconciled bank statements as well as other appropriate supporting documents.

Annex 7

Western Indian Ocean

Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table A

Disbursement per year

Total Project Disbursement

(in US\$ million)

Bank FY	2006	2007	2008	2009	2010
Annual	1.6	4.4	5.2	12.7	1.5
Cumulative	1.6	6.0	11.2	23.9	25.4
Percentage	6%	24%	44%	94%	100%

Note: Figures may not add up to total due to rounding

GEF Disbursement

(in US\$ million)

Bank FY	2006	2007	2008	2009	2010
Annual	0.4	1.8	2.9	5.5	0.5
Cumulative	0.4	2.1	5.0	10.6	11.0
Percentage	3%	19%	45%	96%	100%

Note: Figures may not add up to total due to rounding

Other contributors (in-kind) Disbursement

(in US\$ million)

Bank FY	2006	2007	2008	2009	2010
Annual	1.2	2.7	2.3	7.2	1.1
Cumulative	1.2	3.9	6.2	13.3	14.4
Percentage	8%	27%	43%	93%	100%

Note: Figures may not add up to total due to rounding

Annex 8: Procurement Arrangements
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

The following procurement arrangements will apply to all wholly or partly GEF/Bank financed contracts.

A. General

All procurement for the marine highway component (component A) and for the port state control and regional component (component D) will be carried out by SAMSA through the RPMU. All procurement for components B and C will be carried out by the IOC through the SRPMU, under the monitoring of the RPMU. Works and goods wholly or partly financed by GEF/Bank would be procured in accordance with the Bank's guidelines for Procurement under IBRD Loans and IDA Credits dated May 2004. Consultancy services wholly or partly financed by GEF/Bank would be procured in accordance with the Bank's Guidelines for Selection and Employment of Consultants by World Bank Borrowers published in May 2004. The RPMU and the SRPMU responsible for procurement will be strengthened to ensure that staff have adequate skills and competence to implement the project. As soon as possible and no later than negotiations, a General Procurement Notice is to be prepared by SAMSA and transmitted to the Bank for publication in the United Nations Development Business to advertise all ICB works and goods and major consulting assignments expected to be financed by GEF/Bank under the project. During negotiations assurances will be obtained from SAMSA and the IOC that the procurement arrangements will be followed during project implementation. Table A below provides information on the project elements, their estimated costs and methods of procurement including elements financed by the GEF/Bank as well as those financed by other sources.

Procurement of works: Contracts for the supply of works valued at US\$500,000 or more will be procured under ICB. No National Competitive Bidding (NCB) is anticipated.

Procurement of goods and equipment: Contracts for the supply of goods and equipment valued at US\$100,000 or more will be procured under ICB. No National Competitive Bidding (NCB) is expected. Small items of equipment, goods and materials costing less than US\$30,000 per contract, up to an aggregate of US\$ 70,000, will be procured through international shopping, on the basis of quotations from at least three eligible suppliers.

Prior and post review by the Bank for works contracts. All GEF/Bank financed works contracts above the threshold of US\$100,000 per contract will be subject to prior review procedures in accordance with the Bank's Guidelines. All other contracts under these thresholds will be subject to post review.

Prior and post review by the Bank for goods and equipment contracts. All GEF/Bank financed goods contracts above the threshold of US\$100,000 per contract will be subject to prior review procedures in accordance with the Bank's Guidelines. All other contracts under these thresholds will be subject to post review.

Procurement of consulting services and training. Recruitment of consulting firms for the project, training of personnel, technical assistance and studies, will be carried out under the Quality and Cost Based Selection method (QCSB) in accordance with the Bank's Guidelines. Exception to using the QCSB method will apply to financial audits for which the Least Cost Selection will be used (US\$150,000 in aggregate). Consulting assignments that cost less than US\$100,000 contract, for which at least three regional/national firms are capable of doing such assignments will be recruited on the basis of a short list of regional/national firms. Recruitment of individual consultants for assistance to IOC and/or PMU to carry out project implementation will be done on the basis of qualifications and experience in accordance with the Bank's Guidelines. For experts provided to the project by the partners, procurement will only involve travel and subsistence expenditures which will be processed under SOEs (see Disbursement Section).

Prior and post review by the Bank for consultancy contracts. All consultant contracts expected to cost the equivalent of US\$100,000 or more per contract with firms, all audit contracts and all contracts with individuals expected to cost the equivalent of US\$50,000 or more per contract will be subject to prior review by the Bank. With respect to each contract for the employment of consulting firms estimated to cost the equivalent of less than US\$200,000 and more than US\$100,000 and all financial management assistance and audit contracts, the procedures set forth in paragraphs 1, 2 (other than the second subparagraph of paragraph 2 (a)) and 5 of Appendix 1 to the Consultant Guidelines shall apply. With respect to each contract estimated to cost the equivalent of US\$ 200,000 or more, the procedures set forth in paragraphs 1, 2 (other than the third subparagraph of paragraph 2(a)) and 5 of Appendix 1 to the Consultant Guidelines shall apply. All other contracts will be subject to post review. These procurement thresholds are summarized in Table B below.

Procurement plans and advance procurement actions. SAMSA and IOC will provide detailed procurement plans for the first eighteen months of the implementation of the project, following appraisal (by April 2005). These procurement plans will be used as a basis for monitoring of procurement processing. The following documents will also be prepared by SAMSA and IOC and transmitted to the Bank for review: (a) draft General Procurement Notice; (b) draft bidding documents for ICB goods; (c) terms of reference, short list, Letter of Invitation (LOI), draft model contract for studies, expertise and training. These documents will be agreed during negotiations, and finalized prior to effectiveness.

Reporting. It will be agreed with SAMSA and IOC that a monthly progress report up to grant effectiveness will be prepared in sufficient detail and transmitted to the Bank. During project implementation (after effectiveness), a semiannual report will be adequate. These details will include: major procurement actions dealt with during the previous semester and major procurement actions planned for the following semester, an update of the procurement implementation table, time taken for specific actions such as completion of essential bidding documents, bid evaluation, compliance with aggregate limits on specified methods of procurement.

Annex 8
Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table A
Procurement Arrangements
 (US\$ Million)

Procurement Arrangements (US\$ Million)	Procurement Method				Total
	International	Local		N.B.F.	
	Competitive Bidding	Competitive Bidding	Other		
A. Works	3.2 (3.2)			1.2 (0.6)	4.3 (3.8)
B. Equipment, goods & materials	1.4 (1.4)	0.3 (0.3)	0.1	7.3	9.2 (1.8)
C. Expertise & consultants' services	0.1 (0.1)		5.1 (3.5)	1.8 (0.2)	7.0 (3.8)
D. Training			2.5 (1.5)	1.4	3.9 (1.5)
E. Operating Costs			0.2 (0.2)	0.8	
	4.7 (4.7)	0.3 (0.3)	7.9 (5.2)	12.4 (0.7)	25.4 (11.0)

Note: Figures in parenthesis are the respective amounts financed by GEF

Annex 8
Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table B
Procurement Thresholds
 (US\$)

Expenditure Category	Contract Value (Threshold)	Procurement Method	Contracts Subject to Prior Review
1. Works	>= 500,000	I.C.B.	All
	>=50.000 < 500,000	L.C.B.	>=100,000
2. Equipment, goods and materials	>= 100,000	I.C.B.	>=100,000
	>=50.000 < 100,000	L.C.B.	100,000
3. Expertise & consultants' services	Firms	Q.C.B.S./L.C.S.	>=100,000
	Individual	Individuals	>=50,000

Annex 8
Western Indian Ocean
 Marine Highway Development and Coastal and Marine Contamination Prevention Project

Table C
Allocation of Grant Proceeds
 GEF
 (US\$ '000 000)

Expenditure Category	Suggested Allocation of Grant Proceeds	
	Grant Amount	Financing %
1. Works	3.4	100
2. Equipment, goods and materials	1.8	100
3. Expertise & consultants' services	3.4	100
4. Training	1.4	100
5. Operating costs	0.2	100
Unallocated	0.9	
Total	11.0	

Grant amounts financed by GEF

B. Assessment of the agency's capacity to implement procurement

Sections B, C, D, and E will be completed during appraisal.

C. Procurement Plan

D. Frequency of Procurement Supervision

E. Details of the Procurement Arrangements Involving International Competition

Annex 9: Economic and Financial Analysis

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

Economic analysis. The economic benefits from the project will derive from three main sources. First, the marine highway once established will lower the costs of shipping by reducing the risk of accidents and by allowing ships to operate in storms and other adverse conditions that would idle them if they relied on conventional navigational systems. It will also generate value for the fishing industry by contributing to improved management of fish stocks. Second, the expansion of the regional oil and chemical spill contingency plan, the development of national plans for the countries of continental Africa, and improved port state control will reduce the risks of catastrophic environmental and property damage and loss of life from oil and chemical spills, which should be reflected in reduced insurance costs. Third, the improved environmental information systems will help policy makers to better manage natural resources. Quantification of the costs and benefits of the project is not possible at this time. The proposed project will support the installation of a demonstration marine highway, and neither the costs nor the benefits of a future investment can be assessed at this time.

Financial analysis. The project is will have limited if any fiscal implications for participating countries. Ship owners are expected to bear most or all of the costs for maintaining and operating the marine highway through user fees, because they will benefit directly from the improved navigational services. Countries have agreed to identify sources of financing to sustain capacity for national and regional oil spill response, environmental information systems, and the like. Countries that are signatories to the CLC92 and the FUND92 conventions have a strong incentive to maintain oil spill response capacity once created. These conventions entitle signatories to compensation for damage arising from oil spills, but only if countries have maintained adequate capacity to respond to an oil spill and limit its damage. The experience of the countries participating in the Western Indian Ocean Islands Oil Spill Contingency Planning Project demonstrates that the resources required in any case are not substantial. Mauritius, which maintains a relatively high level of capacity as it seeks to become a transshipment port for the region, is allocating less than US\$35,000 per year for this purpose.

A study identifying sustainable institutional and financial arrangements is being completed. With project support, countries will prepare action plans to be agreed and implement their recommendations during project implementation.

Annex 10: Safeguard Policy Issues
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

No safeguard policies are triggered by this project.

The safeguard screening category is S2 (no safeguard issues).

The environmental screening category is C (no adverse environmental impact).

Annex 11: Project Preparation and Supervision
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

	Planned	Actual
PCN review	06/12/2003	10/14/2003
Initial PID to PIC	10/17/2003	10/14/2003
Initial ISDS to PIC	12/17/2003	12/17/2003
Appraisal	07/25/2005	
Negotiations	08/28/2005	
Board/RVP approval	09/26/2005	
Planned date of effectiveness	12/15/2005	
Planned date of mid-term review	01/15/2008	
Planned closing date	06/30/2010	

Key institutions responsible for preparation of the project:

The IOC (acting on behalf the governments of Comoros, Madagascar, Mauritius, and Seychelles); and the ministries of transport of Kenya, Mozambique, South Africa, and Tanzania in collaboration with the ministries of environment prepared the project.

A GEF PDF Block B grant of US\$700,000 (TF053161) was received and used for project preparation by (a) the IOC (acting on behalf the governments of Comoros, Madagascar, Mauritius, and Seychelles); and the (b) the governments of Kenya, Mozambique, South Africa, and Tanzania. The grant was used to contract consulting services for: (a) analysis of risks to the marine environment and pre-feasibility study of a potential marine highway; and (b) preparation of the project, including identifying national and regional institutions to implement the project, developing costings and implementation timelines for the activities of each component, and preparing engineering studies, financial management arrangements and procurement plans, a monitoring and evaluation plan, and a project implementation plan; and (c) support of a high-level seminar of government decisionmakers, partners, and other stakeholders.

The grant is being successfully executed. Both the recipients and other stakeholders have benefited from the consultations and workshops, and gained experience in project management and administration and international procurement which will be valuable in implementing the project.

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Abdelmoula Ghzala	Team Leader	AFTTR
Philippe de Naurois	Financial Analyst (consultant)	AFTTR
Wendy S. Ayres	Economist (consultant)	AFTP2
Ntombie Siwale	Program Assistant	AFTTR
Robin Broadfield	Senior Regional Coordinator (Peer Reviewer)	EASEN

Marc Juhel	Lead Transport Specialist (Peer Reviewer)	TUDTR
Subhash Seth	Procurement	AFTTR
Alberto Ninio	Senior Counsel	LEGA
Monica Sawyer	Counsel	LEGA
Gervais Rakotoarimanana	Senior Financial Management Specialist	AFTFM
Sylvain Rambelison	Senior Procurement Specialist	AFTPC
Neil Guy	Hydrographic Specialist (PDF B regional coordinator)	AFTTR
Raj Prayag	Environmental Specialist (consultant)	AFTTR

Bank funds expended to date on project preparation:

1. Bank resources: US\$340,119
2. Trust funds: US\$343,074
3. Total: US\$683,193.

Estimated Approval and Supervision costs:

1. Remaining costs to approval: US\$473,760
2. Estimated annual supervision cost: US\$150,000.

Annex 12: Documents in the Project File
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

Bank/GEF documents

Project Concept, November 10, 2003.

Aide memoires.

Consultant reports

“Capacity Building and Training Needs Report,” January 2005, by the Rotterdam Maritime Group.

“Widening the Oil Spill Contingency Capacity in the Western Indian Ocean Region (Kenya, Mozambique, and Tanzania), January 2005, by the Rotterdam Maritime Group.

“Western Indian Ocean Pollution Risk Assessment,” January 2005, by the Rotterdam Maritime Group.

“Regional Marine Highway Development Pre-Feasibility Report,” January 2005, by the Rotterdam Maritime Group.

“Regional Institutional Strengthening and Project Management,” January 2005, by the Rotterdam Maritime Group.

Annex 13: Statement of Loans and Credits
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

Project ID	FY	Purpose	Original Amount in US\$ Millions					Difference between expected and actual disbursements		
			IBRD	IDA	SF	GEF	Cancel.	Undisb.	Orig.	Frm. Rev'd
P073594	2002	Financial Sector Supervisory Authority	1.81	0.00	0.00	0.00	0.56	0.99	1.55	0.00
P001921	1998	ENV. SEWERAGE & SAN	12.40	0.00	0.00	0.00	0.00	5.79	5.79	5.29
Total:			14.21	0.00	0.00	0.00	0.56	6.78	7.34	5.29

MAURITIUS
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

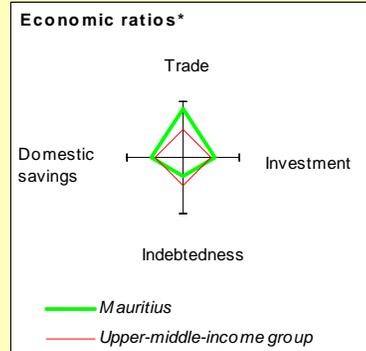
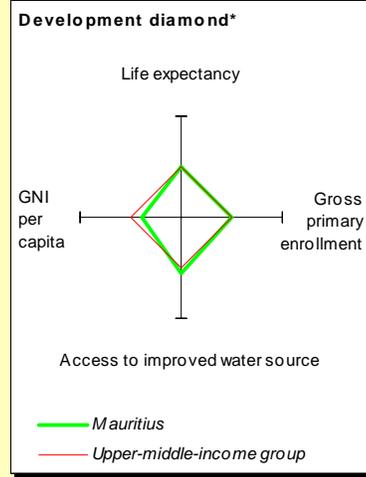
FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
1996	MVCF	0.00	0.40	0.00	0.00	0.00	0.40	0.00	0.00
Total portfolio:		0.00	0.40	0.00	0.00	0.00	0.40	0.00	0.00

FY Approval	Company	Approvals Pending Commitment			
		Loan	Equity	Quasi	Partic.
Total pending commitment:		0.00	0.00	0.00	0.00

Annex 14: Country at a Glance

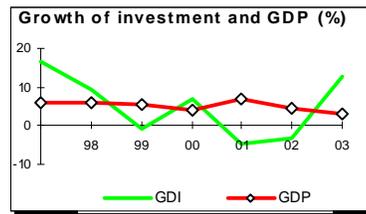
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

POVERTY and SOCIAL	Mauritius	Sub-Saharan Africa	Upper-middle-income		
2003					
Population, mid-year (millions)	12	703	335		
GNI per capita (Atlas method, US\$)	4,090	490	5,340		
GNI (Atlas method, US\$ billions)	5.0	347	1,788		
Average annual growth, 1997-03					
Population (%)	1.1	2.3	1.2		
Labor force (%)	1.4	2.4	1.8		
Most recent estimate (latest year available, 1997-03)					
Poverty (% of population below national poverty line)		
Urban population (% of total population)	43	36	76		
Life expectancy at birth (years)	73	46	73		
Infant mortality (per 1,000 live births)	17	103	19		
Child malnutrition (% of children under 5)		
Access to an improved water source (% of population)	100	58	89		
Illiteracy (% of population age 15+)	16	35	9		
Gross primary enrollment (% of school-age population)	106	87	104		
Male	106	94	104		
Female	106	80	104		
KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1983	1993	2002	2003	
GDP (US\$ billions)	1.1	3.3	4.5	5.2	
Gross domestic investment/GDP	17.6	30.0	21.4	22.9	
Exports of goods and services/GDP	46.5	58.7	60.7	59.7	
Gross domestic savings/GDP	16.1	25.2	25.2	25.3	
Gross national savings/GDP	14.9	28.5	26.5	26.8	
Current account balance/GDP	-5.0	-1.3	5.2	2.7	
Interest payments/GDP	2.8	1.4	0.8	0.7	
Total debt/GDP	51.6	31.1	38.9	35.4	
Total debt service/exports	21.3	7.4	7.0	6.5	
	1983-93	1993-03	2002	2003	2003-07
(average annual growth)					
GDP	6.6	5.1	4.4	3.2	4.6
GDP per capita	5.7	4.0	3.3	2.2	3.6

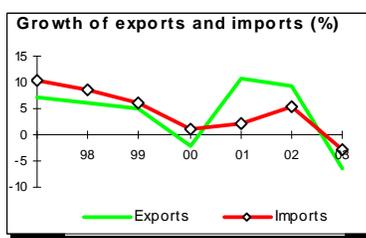


STRUCTURE of the ECONOMY

	1983	1993	2002	2003
<i>(% of GDP)</i>				
Agriculture	15.5	11.2	7.0	6.1
Industry	24.9	33.0	31.1	30.6
Manufacturing	16.3	23.5	22.9	22.0
Services	59.6	55.8	61.9	63.3
Private consumption	69.5	62.1	62.0	61.7
General government consumption	14.4	12.7	12.8	13.0
Imports of goods and services	48.0	63.5	56.9	57.3



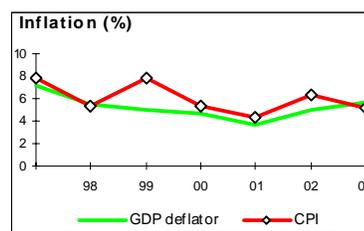
	1983-93	1993-03	2002	2003
<i>(average annual growth)</i>				
Agriculture	1.0	0.4	6.6	-12.2
Industry	9.9	5.2	2.9	1.1
Manufacturing	10.0	4.9	2.3	-1.1
Services	6.1	6.1	5.6	6.2
Private consumption	6.8	5.6	3.1	3.2
General government consumption	4.4	4.8	4.5	5.4
Gross domestic investment	13.5	3.2	-3.3	12.5
Imports of goods and services	13.3	4.8	5.2	-3.0



* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

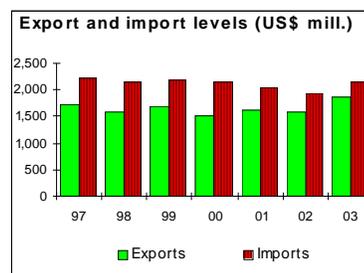
PRICES and GOVERNMENT FINANCE

	1983	1993	2002	2003
Domestic prices (% change)				
Consumer prices	7.5	8.9	6.3	5.1
Implicit GDP deflator	8.5	8.0	5.0	5.6
Government finance (% of GDP, includes current grants)				
Current revenue	22.9	21.2	18.5	20.3
Current budget balance	-3.2	2.8	-1.9	-0.8
Overall surplus/deficit	-9.4	-1.9	-6.1	-6.2



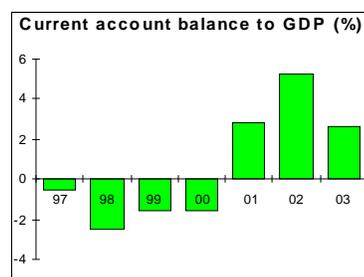
TRADE

	1983	1993	2002	2003
<i>(US\$ millions)</i>				
Total exports (fob)	345	1,343	1,569	1,871
Sugar	212	363	283	267
Manufactures	107	861	1,101	1,240
Total imports (cif)	453	1,670	1,923	2,162
Food	127	219	316	345
Fuel and energy	82	126	184	195
Capital goods	45	378	456	512
Export price index (1995=100)	..	93	84	88
Import price index (1995=100)	..	95	89	93
Terms of trade (1995=100)	..	98	94	95



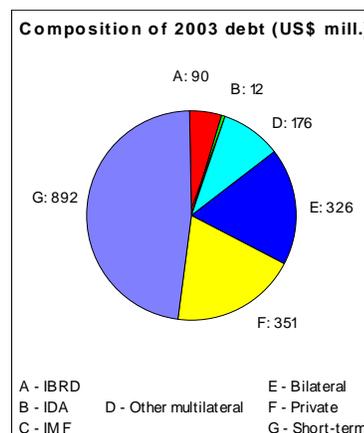
BALANCE of PAYMENTS

	1983	1993	2002	2003
<i>(US\$ millions)</i>				
Exports of goods and services	474	1,914	2,749	3,065
Imports of goods and services	516	2,068	2,577	3,005
Resource balance	-42	-153	172	60
Net income	-45	12	5	-2
Net current transfers	31	96	61	81
Current account balance	-56	-44	238	139
Financing items (net)	49	-11	5	180
Changes in net reserves	7	56	-243	-319
Memo:				
Reserves including gold (US\$ millions)	39	823	1,018	1,398
Conversion rate (DEC, local/US\$)	11.2	16.3	30.1	28.6



EXTERNAL DEBT and RESOURCE FLOWS

	1983	1993	2002	2003
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	572	1,029	1,766	1,847
IBRD	61	150	83	90
IDA	20	18	13	12
Total debt service	108	166	211	215
IBRD	9	33	20	19
IDA	0	1	1	1
Composition of net resource flows				
Official grants	0	-1	-1	-2
Official creditors	23	-6	5	16
Private creditors	-14	17	-49	-27
Foreign direct investment	1	-36	48	57
Portfolio equity	0	0	-19	-21
World Bank program				
Commitments	39	18	40	0
Disbursements	7	12	45	0
Principal repayments	4	22	17	18



Annex 15: Incremental Cost Analysis

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

1. Development goals

The project's development objective is to increase the safety and efficiency of navigation. This will be achieved by establishing a demonstration marine highway to guide ships through selected busy sea lanes and by strengthening capacity for port state control.

2. Baseline

Marine highway development. All the countries in the region maintain some navigational charts. However, underground seismic activity is common in the area, and charts are not updated frequently enough to show the changes. Many have been created and are being updated using technology that is now obsolete in richer parts of the world. Similarly, all countries maintain some aids to navigation. These, too, are based on outmoded technology. As a result, ships take significant precautions to avoid colliding with one another or grounding on shoals whose locations are uncertain. Countries would like to upgrade to more reliable and precision navigation systems in cooperation with the shipping industry, but will not likely be able to forge a regional agreement that would ensure all countries followed the same approach (which would lower costs to ships of installing equipment), or to be able to install a demonstration project to test its feasibility in the region. Moreover, large fishing vessels often operate in the region without obtaining the necessary licenses, fail to report or misreport their catch, or use prohibited techniques. All countries of the region are now exploring ways to enforce their fishing regulations, such as through the use of satellite-linked vessel monitoring systems. With very different capacities, all are moving at different speeds.

Oil and chemical spill contingency planning. The island countries of the western Indian Ocean region are taking action to protect their marine and coastal ecosystems. Comoros, Madagascar, Mauritius, and Seychelles—with support of the GEF-financed Western Indian Ocean Oil Spill Contingency Planning Project—have prepared and tested national oil spill contingency plans and have established capacity within their ministries of environment robust capacity to respond to oil spill emergencies. They have also ratified key IMO conventions and translated their provisions into national legislation. They have also entered into a regional oil spill contingency plan and established a regional oil spill coordination center in Madagascar that is responsible for coordinating periodic updating of the plan, regional exercises, and response to an actual emergency.

The coastal countries of southeastern Africa are also acting to safeguard their marine and coastal environments, although at different paces. Kenya has ratified the OPRC90. It prepared in July 2001 a national oil spill response contingency plan, and has capacity to address Tier 1 and Tier 2 oil spills. To coordinate response to oil spills, it has established the national oil spill response committee with representatives of the Kenya Ports Authority, the oil industry, the shipping industry, and bunkering services. The Kenya Ports Authority owns key oil spill response equipment, including a tug equipped with spraying equipment and a catamaran equipped with

boom, spray arms, and several skimmers. Additional equipment is planned to be secured near future, with support of the local oil companies and the national authorities.

Neither Mozambique nor Tanzania have yet ratified OPRC90, but both countries have committed to doing so. Tanzania with support of the IMO prepared in 2003 a national oil spill response contingency plan. The Tanzania Harbors Authority, which has jurisdiction over the major ports of the country, including Dar-Es-Salaam, Mtwara and Tanga is responsible for coordinating oil spill response, in conjunction with the National Environment Management Council. Mozambique has prepared a draft national oil spill response contingency plan and has established a working group including relevant public institutions, NGOs, and the oil industry. Neither Mozambique nor Tanzania currently have little specialized equipment with which to address even minor spills. None of the three countries are party to a regional agreement that would allow them to pool resources to address Tier 3 oil spills. None of the three countries have produced sensitivity maps that would provide them with information for planning land use and controlling movement of ships through environmentally sensitive areas. Currently, regional oil spill response capacity resides only in South Africa and its Regional Response Center.

Port state control. Kenya, Mauritius, South Africa, Mozambique, Seychelles, and Tanzania are parties to the Indian Ocean Memorandum of Understanding for Port State Control. Only South Africa, however, has implemented a port state control system, which aims to verify whether foreign flag vessels calling at a port of state complies with applicable international conventions and with national laws. The other countries have yet to implement an inspection regime. Nearly all 265 inspections carried out in 2003 were carried out by SAMSA. Mauritius carried out one inspection and the other countries carried out none. Comoros, and Madagascar are not currently parties to the memorandum of understanding.

Global environmental objective

The project's medium to long-term global environmental goal is to reduce the risk of ship-based environmental contamination (such as oil spills from groundings and illegal discharges of ballast and bilge waters) and to strengthen the capacity of countries to respond to oil or chemical spill emergencies in the region.

The project has three specific global environmental objectives. The first is to ascertain the economic, technical, and institutional feasibility of introducing precision navigation systems in the region, such as an electronically supported marine highway, to guide ships through sensitive areas and to monitor the movements and activities of fishing and other vessels operating within countries' territorial waters. The second objective is to support widening the existing regional agreement (June 5, 1998) on port state control and implementation of its provisions. The third objective, focusing on Kenya, Mozambique, and Tanzania, is to reduce risks of environmental damage to beaches, fishing grounds, and other domestic resources from spills of oil and chemicals. This will be achieved by supporting efforts of Kenya, Tanzania, and Mozambique to become part of a regional oil spill response plan, by completing the identification and mapping of environmentally sensitive areas along coasts and sea lanes, and by widening the regional collaboration that has been built under the GEF-supported West Indian Ocean Islands Oil Spill Contingency Planning Project.

GEF Alternative

Marine highway development. The GEF alternative will provide the catalyst to install a demonstration precision marine navigation system based on common technological standards, test the feasibility of the approach, and assess the potential benefits of scaling up. Should the concept prove feasible and the benefits to countries and to ships clear, it is expected that a barrier to a safer and more efficient navigation system will have been overcome, and that precision navigation aids will be installed on all the busy routes in the region and be used by all ships above a certain size. The technology of the marine highway is also expected to provide benefits for the management of fisheries and other marine living resources in several ways. The electronic nautical charts incorporating information on environmental resources will enable oil and chemical tankers to avoid environmentally-sensitive areas. They will also help fisheries managers to target their monitoring and control efforts. The technology of the marine highway may also be useful to authorities for monitoring, control, and surveillance of fishing vessels by demonstrating the value of satellite-linked systems for these purposes. The benefits for fisheries management are thus likely to significantly exceed the value of the expenditures on activities directly related to fisheries.

Oil and chemical spill contingency planning. The GEF alternative would enable Kenya, Mozambique, and Tanzania to contribute to and benefit from the regional oil spill contingency plan and the regional oil spill coordination center. This would make it possible to respond to accidents rapidly wherever they occurred in the region. Rapid response is critical to minimize damage from oil and chemical spills. Widening regional capacity would also create a framework for the cooperation among the countries in other areas of shared concern, such as sustainable fisheries management. The GEF alternative will also provide the catalyst to bring the governments of Kenya, Mozambique, and Tanzania and the local and international oil shipping industries together in a cooperative partnership in that will be sustained once the countries join the regional plan and enter into agreements for sustainable financing. Further, oil companies have pledged to provide technologies and expertise to address oil spill emergencies.

Port state control. The GEF alternative would facilitate the widening the regional memorandum of understanding on port state control (June 5, 1998) to include Comoros and Madagascar. It will also support its implementation. Having such capacity will enable the countries to inspect ships entering their ports to ensure that they comply with international conventions and national laws governing safety and environmental practices and living and working conditions. Having such capacity will also enable the authorities to control the under-reporting or misreporting of fish catches and penalize offenders.

Scope of the analysis

The activities related to the development of the marine highway, widening the regional agreement on port state control and strengthening capacity to implement it, and widening the regional contingency plan would not take place without the GEF alternative. The oil spill contingency planning activities are largely baseline activities and the GEF will allocate limited

funding for these, focusing on the activities designed to create the regional plan and strengthen regional collaboration.

Domestic benefits in addition to those in the baseline include reductions in risks of damage to marine and coastal resources that provide employment, foreign exchange, and food for country nationals, such as tourism and fishing. Additional domestic benefits will also arise from the increased safety and efficiency of navigation faced by national flag ships transiting through the region. Countries will also benefit from the reduced pollution (such as gasoline discharges) and noise of foreign flag carriers that are able to pass through the region more rapidly.

Table A: Incremental Cost Summary

	Costs (US\$M)	Domestic Benefit	Global Environment Benefit
Baseline			
A. Regional marine highway development	0.0	Reduced risk of contamination of beaches and fisheries, primarily in Kenya and, to a lesser extent, Tanzania.	No regional capacity would be developed. No global benefits would be generated.
B. Capacity building for prevention of marine and coastal contamination	0.0		
C. Widening the regional plan	1.6		
D. Regional institutional strengthening and project management	0.2		
<i>SUBTOTAL</i>	<i>1.8</i>		
Alternative			
A. Marine highway development	13.9	Reduced risk of damage to tourist beaches. Improved efficiency of shipping, benefiting producers and consumers of goods. Improved management of fish stocks for the long-term benefit of local fishers.	Reduced risk of damage to coastal and marine biodiversity. Improved safety and efficiency of navigation. Reduced risk of security incidents in the region involving pirates and terrorists. Improved fishery management.
B. Capacity building for prevention of marine and coastal contamination	3.9		
C. Widening the regional plan	4.0		
D. Regional institutional strengthening and project management	3.7		
<i>SUBTOTAL</i>	<i>25.4</i>		
Increment			
A. Marine highway development	13.9		
B. Capacity building for prevention of marine and coastal contamination	3.9		
C. Widening the regional plan	2.4		
D. Regional institutional strengthening and project management	3.5		
<i>SUBTOTAL</i>	<i>23.7</i>		
GEF Grant	11.0		

The costs of baseline activities are estimated to total US\$1.8 million. These costs are for activities related to widening the regional plan to increase capacity in Mozambique, Tanzania and Kenya, and for port state control in South Africa. The incremental cost of the project, totaling US\$25.4 million, will enable the project to achieve its global environmental objectives. Of this, less than 45 percent is requested from the GEF. The remaining support will come from bilateral donors primarily in the form of grants and from the international and local shipping industry and nongovernmental organizations representing the oil and shipping industries and navigation services in the form of in-kind contributions.

Table B Incremental Cost Matrix: Component A—Regional Marine Highway Development

	Costs (US\$M)	Domestic Benefit	Global Environment Benefit
Baseline			
1. Nautical charts and publications	0.0	No domestic benefits would be generated.	No global benefits would be generated.
2. Maintenance of charts and publications	0.0		
3. Aids to navigation	0.0		
4. Automatic information service & ship reporting scheme	0.0		
5. Search and rescue	0.0		
6. Evaluation of demonstration phase	0.0		
<i>SUBTOTAL</i>	<i>0.0</i>		
Alternative			
1. Nautical charts and publications	5.0	Reduced risk of damage to tourist beaches; improved management of fish stocks for the long-term benefit of local fishers. Improved efficiency of shipping, benefiting producers and consumers of goods.	Reduced risk of damage to coastal and marine biodiversity. Improved safety and efficiency of navigation.
2. Maintenance of charts and publications	1.2		
3. Aids to navigation	1.2		
4. Automatic information service & ship reporting scheme	5.8		
5. Search and rescue	0.1		
6. Evaluation of demonstration phase	0.5		
<i>SUBTOTAL</i>	<i>13.9</i>		
Increment			
1. Nautical charts and publications	5.0		
2. Maintenance of charts and publications	1.2		
3. Aids to navigation	1.2		
4. Automatic information service & ship reporting scheme	5.8		
5. Search and rescue	0.1		
6. Evaluation of demonstration phase	0.5		
<i>SUBTOTAL</i>	<i>13.9</i>		
GEF Grant	7.2		

Table C Incremental Cost Matrix: Component B—Capacity building for prevention of coastal and marine contamination

	Costs (US\$ M)	Domestic Benefit	Global Environment Benefit
Baseline			
1. Seminars, workshops, and training	0.0	No domestic benefits would be generated.	No global benefits would be generated.
2. External expertise and equipment	0.0		
3. Methodology for valuing benefits of ecosystems	0.0		
4. Regional coastal and marine database	0.0		
<i>SUBTOTAL</i>	<i>0.0</i>		
Alternative			
1. Seminars, workshops, and training	1.2	Site specific pollution and management plans reduces risks of damage to beaches. Focused approach to protecting areas of high environmental importance leads to more efficient use of domestic resources.	Reduced risk of damage to coastal and marine biodiversity. Focused approach to protecting areas of high environmental importance leads more efficient use of resources in general.
2. External expertise and equipment	1.6		
3. Methodology for valuing benefits of ecosystems	0.6		
4. Regional coastal and marine database	0.6		
<i>SUBTOTAL</i>	<i>3.9</i>		
Increment			
1. Seminars, workshops, and training	1.2		
2. External expertise and equipment	1.6		
3. Methodology for valuing benefits of ecosystems	0.6		
4. Regional coastal and marine database	0.6		
<i>SUBTOTAL</i>	<i>3.9</i>		
GEF Grant	0.6		

Table D Incremental Cost Matrix: Component C—Widening capacity for regional oil spill response

	Costs (US\$M)	Domestic Benefit	Global Environment Benefit
Baseline			
1. Conventions ratification	0.1	No domestic benefits would be generated.	No global benefits would be generated.
2. Development of national oil spill contingency plans	0.5		
3. Oil spill response equipment	0.5		
4. Regional agreements and regional contingency planning	0.0		
<i>SUBTOTAL</i>	1.6		
Alternative			
1. Conventions ratification	0.3	Reduced risk of contamination of marine and coastal resources important to tourism and fishers.	Reduced risk to globally important marine and coastal resources immediately and over the long term.
2. Development of national oil spill contingency plans	0.9		
3. Oil spill response equipment	2.5		
4. Regional agreements and regional contingency planning	0.3		
<i>SUBTOTAL</i>	4.0		
Increment			
1. Conventions ratification	0.2		
2. Development of national oil spill contingency plans	0.4		
3. Oil spill response equipment	2.0		
4. Regional agreements and regional contingency planning	0.3		
<i>SUBTOTAL</i>	2.9		
GEF Grant	0.7		

Table E Incremental Cost Matrix: Component D—Port state control and regional institutional strengthening and project management

	Costs (US\$M)	Domestic Benefit	Global Environment Benefit
Baseline			
1. Regional agreement on port state control	0.0		
2. Support for convention compliance	0.0		
3. Project coordination and management	0.0		
<i>SUBTOTAL</i>	<i>0.0</i>		
Alternative		Reduced risk of pollution of ports and territorial waters, and of security incidents involving pirates and terrorists.	Reduced risk of pollution of international waters, and of security incidents in the region involving pirates and terrorists.
1. Regional agreement on port state control	0.3		
2. Support for convention compliance	0.2		
3. Project coordination and management	3.1		
<i>SUBTOTAL</i>	<i>3.7</i>		
Increment			
1. Widening of regional agreement on port state control and implementing its provisions.	0.3		
2. Support for convention compliance	0.2		
3. Project coordination and management	3.1		
<i>SUBTOTAL</i>	<i>3.7</i>		
GEF Grant	2.6		

Annex 16: STAP Roster Review
**Western Indian Ocean Marine Highway Development and Coastal and Marine
Contamination Prevention Project**

Dr. Gullaya Wattayakorn
Department of Marine Science, Chulalongkorn University, Bangkok, Thailand
March 2005

Basis for the proposal

The Western Indian Ocean region is an area of high marine biodiversity significance, rich in marine fauna and flora and extremely sensitive coastal and marine environments. The growing population and expanding urbanization and economic activity in the coastal zones coupled with virtually nonexistent management are increasingly placing marine and coastal resources under threat. The increasing volume of maritime traffic and port development in the region, as well as the increasing mix of other uses are seriously taxing the capacity of the region to handle such growth and diverse uses safely and efficiently. The environmental consequences of the aforementioned situations are increased risk in the number and magnitude of oil spills, discharges of bilge waters and chemical spills from ships. These facts have motivated the countries bordering the Western Indian Ocean to adopt an innovative and more effective approach to improving the management of maritime traffic and marine environment protection in the region.

Goals and expected outcomes

The ultimate goal of this initiative is the use of a precision navigation system, such as a marine highway, to guide ships through sensitive areas and to monitor the movements and activities of fishing and other vessels within countries' territorial waters. The project is planned to be implemented in phases. The first phase will consist of a demonstration project, which if success, will lead to the implementation of a full-scale project that will cover the whole of the Western Indian Ocean region. A key outcome of the demonstration phase will be the commitment of the beneficiary countries and the other partners to roll out a full marine highway covering all major shipping routes of the Western Indian Ocean region. Other outcomes include reduction in the number of accidents, accidental spills, and illegal discharges per ship operating in the region. Potential beneficiaries of the marine highway system apart from the countries bordering the Western Indian Ocean and the shipping sector are those engaged in marine environment protection. The PDF will help finance the feasibility study and the institutional and financial sustainability study.

Comments

The proposed project fits well within the overall strategic thrust of the GEF-funded International Water activities. It will help overcome the barriers to the adoption of best-practice technology in marine navigation and pollution control, and thereby reduce the contamination of the international waters, which is one of the major objectives of the GEF's Operational Program 10 – the International Waters Contaminant-Based Operational Program. It also satisfies the criteria for the international waters operational strategy by assisting countries to better understand the environmental concerns of their international waters and to work collaboratively to address them

by building capacity of a regional institution and by helping countries to implement the international conventions and agreements to which they are party.

This project is foreseen as being useful in building institutional capacity in reduces transboundary pollution and increase the safety of navigation in the Western Indian Ocean region. The enthusiasm and strong support of the various stakeholders, especially of the Governments themselves, are very much needed in order to foster a regional approach to finding solutions to their common problems. Cooperation among international organizations is foreseen as necessary for the development and co-ordination of the project. Hence, a consortium of entities, both inter- and non-governmental, will be involved in its execution and thus ensuring quality outputs. In addition, the collaborative actions initiated by this proposal should be able to be sustained once the stakeholders realize the significant benefit from such incremental actions. The outstanding accomplishments of the GEF-supported Western Indian Ocean Islands Oil Spill Contingency Planning Project indicate the existence of important national and regional initiatives and collaboration. Finally, the SAP and the Project Logical Framework to be elaborated in this proposal is certainly quite comprehensive, effective and appear to be achievable within the period of project implementation. Overall, my review concludes that the immediate objectives and the outputs and activities of the project can be successfully achieved with co-operation among all stakeholders involved.

Annex 17: Summary of Risk Assessment

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

There are two aspects to the risk assessment, namely the areas most prone to oil spill and their environmental sensitivity. This section provides details on the methodology applied to rank the area in terms of risk and thereafter presents the results of the work.

Risk is the product of frequency and consequence. On this basis the results from the oil spill drift analysis were combined with the results of a coastal environmental sensitivity study to determine the areas at greatest risk.

ENVIRONMENTAL SITUATION IN THE REGION

General

The coastal and marine environment of the Western Indian Ocean is important on a global scale. It contains two of the world's 64 major large marine ecosystems in the Agulhas current and the Somali current, which extend from South Africa to Somalia and include the islands of Madagascar, Mauritius, Comoros and Seychelles.

The Western Indian Ocean is a distinct biogeographical province of the Indo-West Pacific and exhibits with high levels of regional endemism. Local and national endemism are generally low, except around some of the islands, notably Mauritius and Reunion, and in southern Mozambique. The region has a high marine biodiversity, particularly for corals reef fish and large marine species including cetaceans and marine turtles.

The marine and coastal environments of the Western Indian Ocean are adversely affected by various human pressures including over-exploitation of living marine food resources, pollution, introduction of alien species, and habitat destruction and degradation. Natural pressures also affect the region including the coral bleaching that occurred during 1998/99 and left many reefs severely damaged.

Marine and coastal habitats

Mangroves and coral reefs are likely to be the sensitive habitats requiring consideration within the context of the proposed project. They are the dominant coastal and near-shore marine habitats of the western Indian Ocean and important to the stability of marine ecosystems, particularly fisheries, because they are nursery areas for many species.

Both mangroves and corals are sensitive to the impacts of oil spill. The severity of oil-related impacts depends on the amount and type of oil spilled the weathering of oil prior to habitat exposure and the physical characteristics of the impacted area.

Mangroves

Mangroves can be considered marine tidal forests. They are most luxuriant around the mouths of large rivers and sheltered bays and are found mainly in the tropics where annual rainfall is fairly

high. The plants are usually adapted to anaerobic conditions of both salt and fresh water environments and have adapted to muddy, shifting, saline conditions. They have stilt roots that project above the mud and water in order to absorb oxygen. The complex mangrove ecosystem includes associated bodies of water and soils as well as a variety of plants, animals and micro-organisms and as such they constitute important areas for commercial fisheries.

Mangrove ecosystems play an important role in coastal protection, stabilising shorelines and decreasing erosion, in fisheries production and provide local populations with a wide range of products including food and wood for building and fuel. It is estimated that a total of 654 species of algae, molluscs, crustaceans, echinoderms and fish of economic importance are associated with the mangroves of the Western Indian Ocean.

Corals Reefs

Coral reefs are made of many animals and plants as well as corals. The growth forms of coral vary enormously and this results in irregular reef structures. Corals occur along shallow, tropical coastlines where the marine waters are clean, clear and warm. The growth of corals is controlled primarily by the availability of light, sediment load and wave action. The complex topography and the high retention of nutrients by corals make coral reefs one of the most productive ecosystems in the world.

Marine and coastal fauna

Oil pollution may affect marine organisms through a variety of means with the vulnerability of the organism dependant upon a number of factors. These include; direct ingestion of oil, loss of prey or primary food source, loss of supporting habitats and the extent of pre-existing habitats and natural population levels.

Marine turtles and marine mammals of the region are particularly vulnerable mainly as a result of their dependency upon the habitats of the region (for example, seagrasses for dugong and suitable nesting beaches for turtles) and their current low populations.

Seabirds

The Western Indian Ocean hosts a number of pelagic feeding seabirds, which are widespread, but concentrations in any one specific area are low. However, waders and wildfowl can congregate in large numbers on the sea or shorelines to breed, feed or moult are particularly vulnerable to oil pollution. Ramsar sites are a good indication of these areas where bird densities are high but important seabird breeding sites also exist at nationally designated Marine Protected Areas such as those of Ile Ronde and Ile aux Serpents in Mauritius. Few species are globally threatened (that is on the International Union for the Conservation of Nature Red List) because most seabirds and waders have very wide distributions.

Marine Turtles

Five of the seven species of marine turtle found in the world occur in the Western Indian Ocean. All are on the International Union for the Conservation of Nature Red List: the hawksbill (*Eretmochelys imbricata*) and the leatherback (*Dermochelys coriacea*) are both categorised as critically endangered; the green (*Chelonia mydas*), olive Ridley (*Lepidochelys olivacea*), and loggerhead (*Caretta*) are listed as endangered.

The life cycle of marine turtles involves a variety of habitats. Eggs are laid and incubate in sandy beaches. The hatchlings and young juveniles are pelagic and inhabit the surface waters of convergence zones and major gyre systems throughout tropical and temperate oceans. The feeding grounds of most adults include sea grass beds, coral reefs, sand and mud flats, and mangrove ecosystems, although the pelagic leatherback feeds in deep waters.

Marine Mammals

Over 27 species of Marine mammal have been recorded in the Western Indian Ocean. However, very few of these frequent inshore waters and are much more heavily dependent upon resources of the open ocean for survival.

Within the study area, the only cetacean (whales, dolphins and porpoises) that regularly resides in the inshore waters of the beneficiary countries is the Indo-Pacific hump-backed dolphin (*Sousa chinensis*). This dolphin is present in the coastal waters of all the beneficiary countries on mainland Africa and Madagascar, but not the smaller islands of Comoros, Mauritius, Reunion and Seychelles. The rare dugong (*D. dugon*) is the only other marine mammal regularly recorded in the western Indian Ocean and is resident in the coastal waters of all beneficiary countries except Reunion and Seychelles. Its distribution coincides with low energy inshore coastal waters that support sea grass beds, its primary food source.

Marine protected areas

Marine protected areas aim at retaining significant coastal and marine resources and environment in their natural state, thus protecting habitat for the productivity of ecosystems and endangered species. The term “marine protected areas” is interpreted in many different ways throughout the world. The International Union for the Conservation of Nature defines a marine protected areas as:

"Any area of intertidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment."

Marine protected areas can be designated by the nation state indicating degree of importance on a regional scale or they can be designated under international guidelines for their importance on an international scale.

World Heritage Sites

The Convention concerning the Protection of the World Cultural and Natural Heritage adopted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1972 developed from the merging of two separate movements: the first focusing on dangers to cultural properties, and the other dealing with conservation of nature. World Heritage Sites are designated according to their cultural and natural attributes, which make them outstanding value to humanity

Three natural heritage sites set in marine environments exist within project region of the Western Indian Ocean. These may exemplify major stages of the earth's history; represent ongoing

ecological and biological processes; contain the most important natural habitats for conservation of globally significant biodiversity; or it may be a setting of exceptional beauty.

Ramsar Sites.

The Convention on Wetlands of International Importance especially as waterfowl habitat (Ramsar, Iran 1971) is an intergovernmental treaty, which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Ramsar sites were originally sites designated under the convention for the conservation of wetlands primarily to provide habitat for water birds but has, over the years, broadened its scope to cover all aspects of wetland conservation. The emphasis has changed to recognize wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well being of human communities.

UNESCO Man and Biosphere Sites

The UNESCO Man and the Biosphere develops the basis, within the natural and the social sciences, for the sustainable use and conservation of biological diversity, and for the improvement of the relationship between people and their environment globally. In particular, the Man and the Biosphere Programme is designed to encourage interdisciplinary research, demonstration and training in natural resource management and further the involvement of science and scientists in policy development concerning the wise use of biological diversity.

National Designations

National designations for marine protected areas vary in name greatly between beneficiary countries and are often referred to as marine parks, national parks, nature reserves, fishing reserves, special nature reserves and wildlife utilization areas. For consistency marine protected areas are classified in accordance with International Union for the Conservation's protected area management categories.

Fisheries and aquaculture

The coastal fishery yield along the entire western boundary of the Indian Ocean, including the various island states of the western half of that ocean, represents less than one percent of the global landings. In spite of this, most of the coastal fish stocks of the region are considered to be fully exploited or even overexploited.

The artisanal fisheries (subsistence fisheries) support over 70,000 fishers in the region. These skilled but not industrialised operators use the traditional fishing methods and gears such as beach seines, traps, fishing lures and cast nets and work in the reefs, lagoons, estuaries and near-shore waters. This type of fishing accounts for more than 80 percent of the total marine fish catch in Comoros and Madagascar.

Coastal fisheries production usually far outweighs production from oceanic species such as tunas and generally constitutes around 90–95 percent of total landings, but in the southwestern Indian Ocean the contributions of coastal and oceanic fisheries are approximately equal. While the coastal fisheries are harvested mostly by coastal states, mostly distant-water fishing fleets from Europe and eastern Asia harvest the more lucrative oceanic fisheries. Even so, and despite the low coastal landings, fishing and its associated economic activities are often extremely important to local economies. In some of the southwestern Indian Ocean countries, fish are nearly the sole

source of animal protein available to the local populations. Moreover, in a region faced with chronic scarcities of foreign exchange, exports of fishery products represent vital sources of exchangeable earnings.

Mariculture and aquaculture are developing in the region and demonstrate high potential as indicated by the recent success of farming of seaweed in Tanzania, tiger prawns in Seychelles and oysters in Kenya. Seaweed farming and related activities in Zanzibar employ over 10,000 local community members and earn the country over US\$10 million foreign exchange.

Environmental Sensitivity

The environmental sensitivity study was conducted in parallel to the analysis reporting within this report. A systematic scoring and ranking method for each square in a grid-based map covering the western Indian Ocean region determined the total sensitivity. The following figures present a plot of the overall scores for environmental sensitivity.

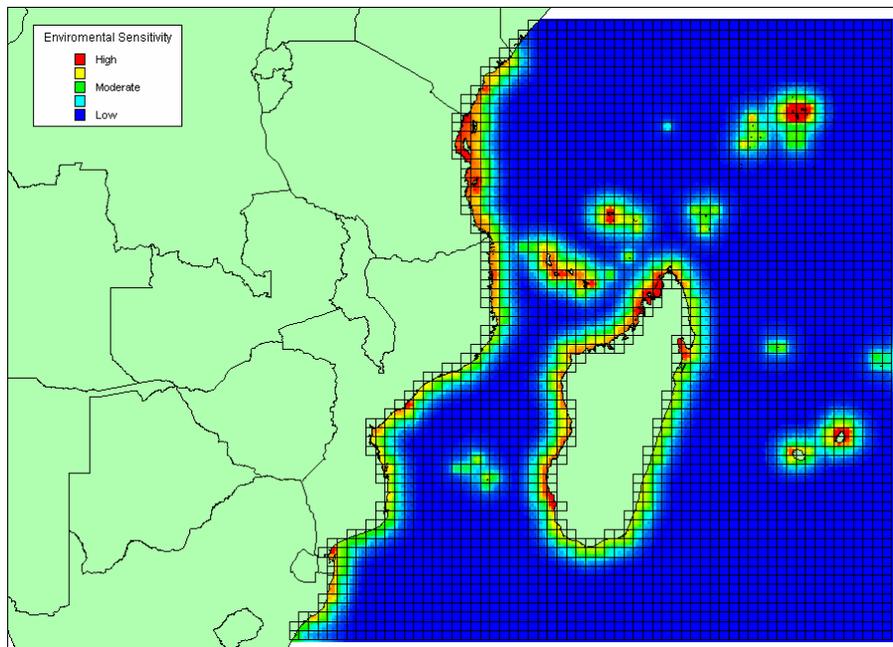


Figure 1 Environmental Sensitivity

Areas Exposed to Pollution from Shipping

The areas exposed to pollution were assessed based on the shipping database, frequency models and consequence assessment.

Figure 3.25: Oil Flows and Major Chokepoints, 2003

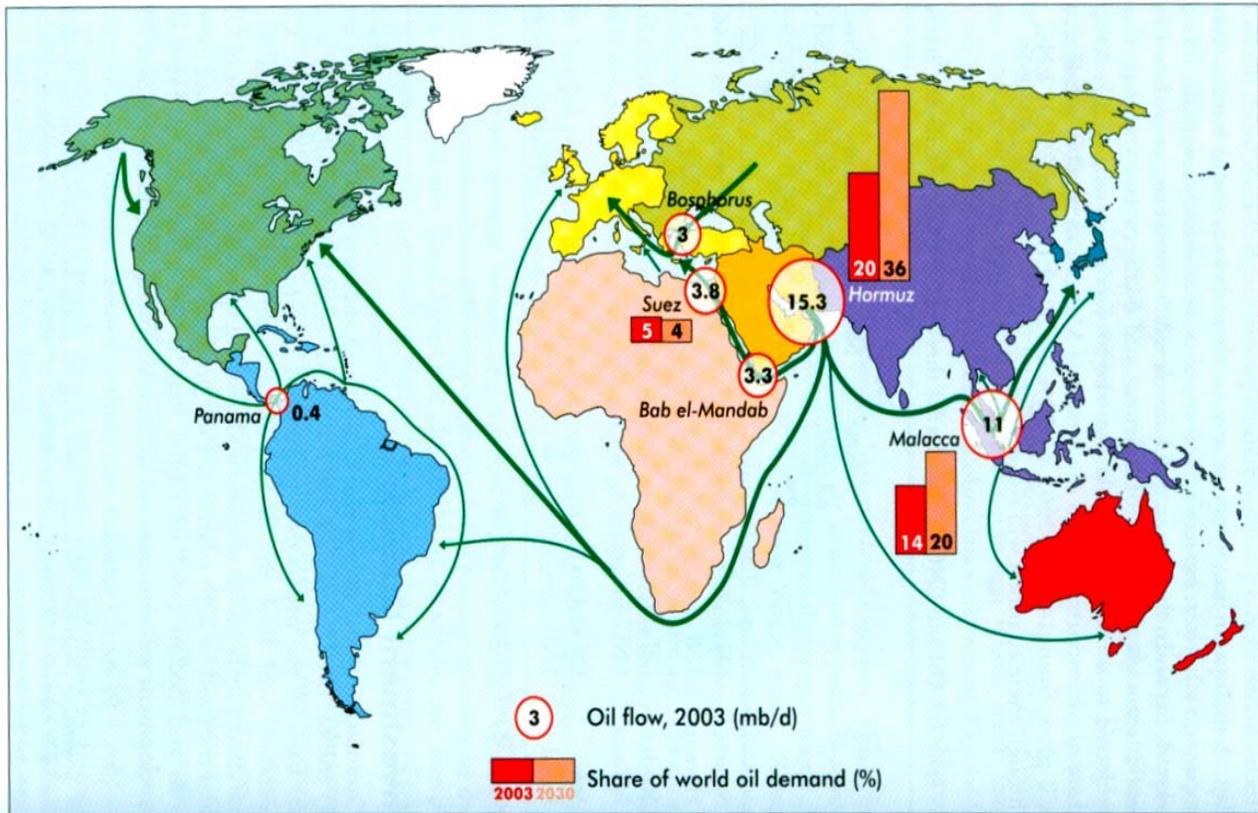


Figure 2 Oil Flows

A detailed analysis of shipping traffic in the area was carried out. This was based on port log data for worldwide ports for all shipping >150 GT. In addition to this localised satellite tracking data and route planning information was incorporated to ensure that the resulting representation of shipping patterns was reliable. The database included information on tankers, cargo vessels and ferries.

Following from this collision risk modelling was conducted using UK models for the following scenario's:

- Ship collision
- Grounding (drifting and powered)
- Fire and explosion
- Foundering or structural failure
- Grounding

The models were not calibrated for the area and United Kingdom calibration was applied. The following factors were given consideration:

Table 1 Factors Considered within Accident Models

Models	Parameters used within Models
Ship collision	Route positions, number of vessels on route, vessel type, size and speed distributions, visibility, encounter angle, vessel traffic services areas.
Powered grounding	Number of vessels on route, vessel type and size distributions, proximity of route to coastline, coastal rockiness, vessel traffic services areas, sea state, geometrical probabilities, navigational error probabilities.
Drifting grounding	Route positions, number of vessels on route, vessel type and size distributions, wind strength and direction, sea conditions, self-repair probabilities, mechanical failure probabilities, drift speeds.
Fire and explosion	Number of vessels on route, vessel type and size distributions.
Foundering and structural failure	Number of vessels on route, vessel type, size and age distributions, traffic densities and probability of severe weather in different geographical locations.

Following assessment of the accident frequencies, an assessment of the likely level of hydrocarbon release was estimated by assessing the volume of cargo held by passing tankers and the bunkers on board all vessels. This was first considered as a quantity of hydrocarbon released at the location of the incident and thereafter the area of likely to be affected by the release giving account to the drift characteristics.

Within the drifting model for the hydrocarbon release localised wind data was applied from admiralty charts covering the area.

Areas exposed to pollution from shipping

The areas exposed to pollution were assessed based on the shipping database, frequency models and consequence assessment.

Risk Analysis

Following determination of the oil presence risk and environmental sensitivity these were combined to produce the over risk results. The following figure provides an overview of the results to give a visual interpretation of the area most at threat from oil spill from shipping.

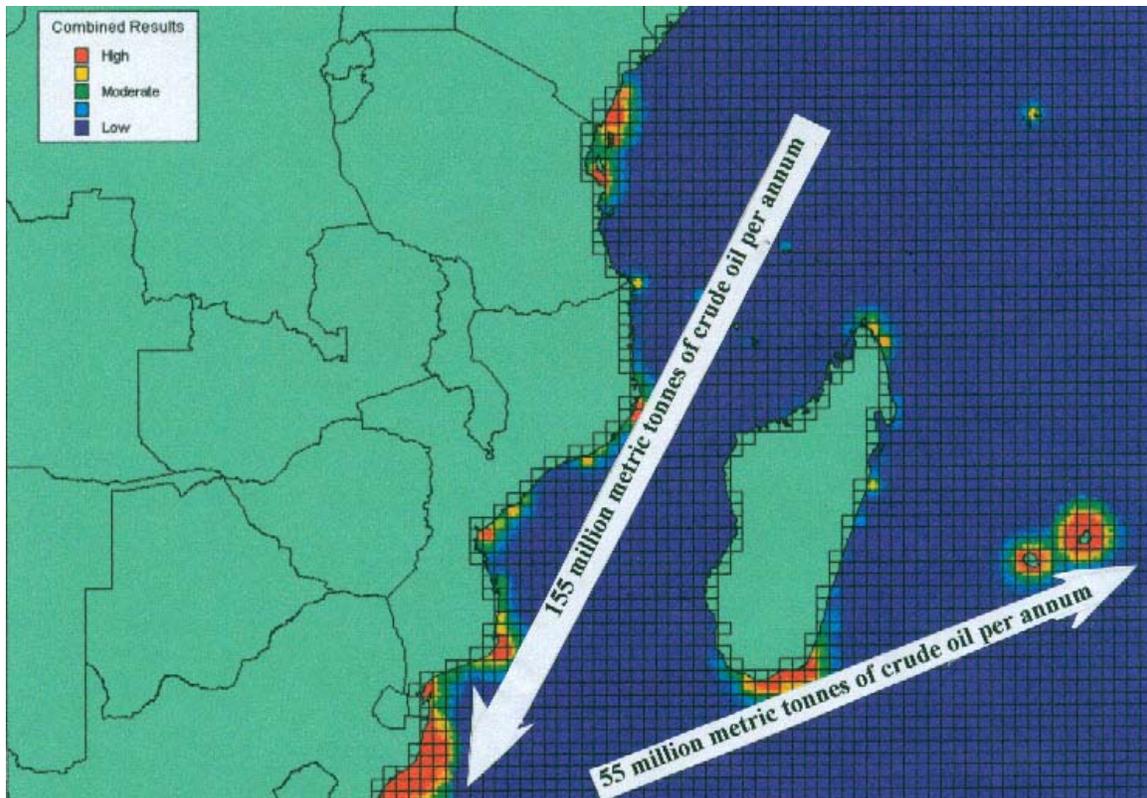


Figure 3 Final Results

The oil spill results were then overlaid on the environmental sensitivity charts and combined to produce the finalised risk results for this study. This identified the following areas as the most sensitive to hydrocarbon pollution from shipping:

Mainland Africa:

- Mombasa, Kenya
- Pemba island
- Dar es Salaam and Zanzibar Channel
- Ponta Sancul to Ponta Namalungo
- Banco de Sofala
- Ponta da Barra
- Baia de Maputo
- Northeast South Africa

Island areas:

- Southern Madagascar (including Banc De L'Etoile)
- Réunion island
- Mauritius

Annex 18: Options for the Route of the Marine Highway in the Western Indian Ocean Region

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

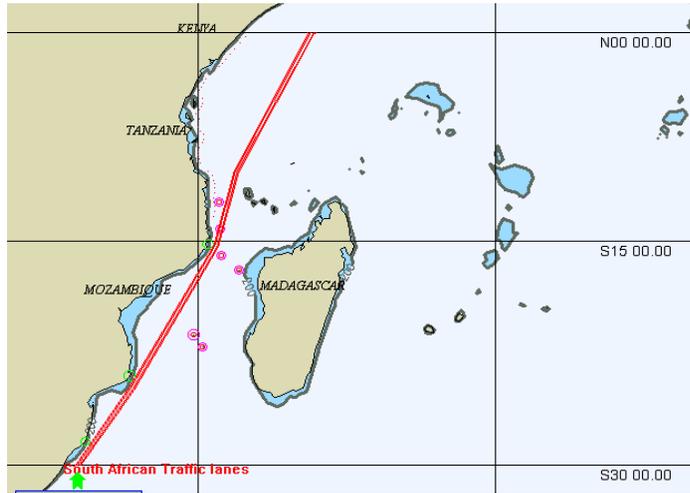
1. A large percentage of the world's oil supply is following the route between the African East Coast and the Islands of Madagascar, Comoros, Seychelles, Mauritius and the Island territories of France in the SW Indian ocean, and
2. This maritime traffic flow will follow the most economical routes based on geographical distances, currents and the like, and
3. The route will, now and in the future, flow into the existing main traffic route, as made compulsory by the Republic of South Africa, and
4. The route will go through areas with a high ecological impact ratio, and
5. Future Marpol, Aton, search and rescue and safety and security -action programs will have to be based on reliable basic hydrographic, environmental and meteorological data.

It is established that a reliable and up-to-data hydrographic chart of the entire route and approached to ports and harbors is to be made available for the future execution of the project. A preliminary evaluation of the existing data has been carried out in the form of a desk study, with existing hydrographic electronic navigation charts and other data as basis for this study. The route, as presently taken by mainly all tanker traffic, is the basis for the proposed route, as describer further on. Other routes, such as the one going south of Madagascar and the one going through the Comoros, is not generally used by tanker trade and is therefore considered to be Priority 2, to be dealt with in a later stage.

The general lay-out of the route, as provisionally determined, was based on the following:

1. Selection of the shortest possible route cape between the cape and the Middle East
2. Minimum distance of 20 nautical miles from shore
3. Traffic lanes of 5 miles wide, one direction only
4. Separation zone of 10 nautical miles, this is based on estimated average navigational errors/accuracy/datum shifts by merchant navy users of the system.
5. 20 nautical miles distance from islands, island groups, shoals and obstructions.

Route No. 1:



The described route has been based on the assumption that a minimum of 20 nautical miles is to be kept from the shorelines and obstructions at all times. Henceforth, this route is an extension of the South African vessel traffic services route, which stops at the latitude of Durban port.

However, due to the possible present lack of support in the fields of maritime pollution, safety and security, it has been argued to change this minimum distance to 50 nautical miles, that is 12 hours drifting towards the coast, assuming a drift rate of four knots.

An alternative route has provisionally been designed and it appears that this route just fits in the area. Several critical areas will have to be surveyed in detail but in general, the route has a minimum depth of at least 1000 meters.

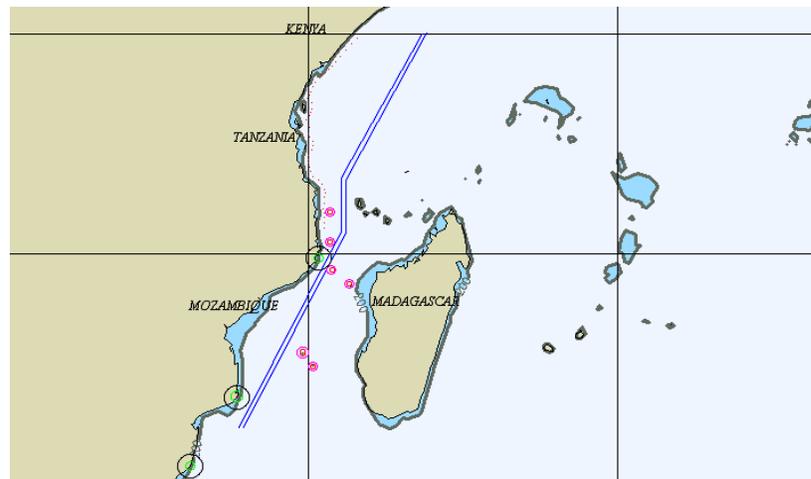
Route No. 2:



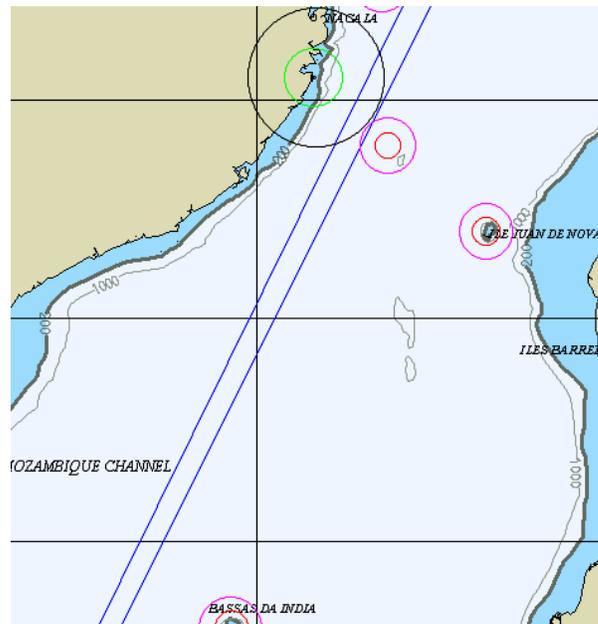
Route No. 3

The original Route 1, is based on the assumption that a minimum of 20 nautical miles is to be kept from the shorelines and obstructions at all times. Alternative route 2 is based on a minimal distance of 50 nautical miles to the shore and obstructions. Alternative route 3 is a combination of routes 1 and 2. The advantage of this route is a more smoother transition in certain parts. One disadvantage is that it passes the coast at one point at less than 50 nautical miles (35 nautical miles).

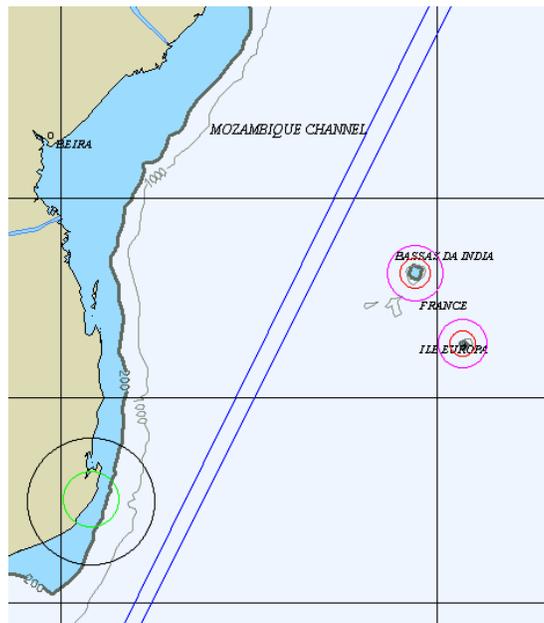
Route No. 3:



At 16° South, the route Passes the mainland at 35NM.



At 25° South, the distance to the coast is more than 50NM.



These two locations are seen in the risk analysis as red hotspots. It is assumed that these two locations, or nearby ports, can be allocated as future Marpol bases. Route 3 is the recommended route, however, detailed design and smoothing of bends is still to be completed. Suggestions and recommendations from the appropriate authorities can be incorporated in this stage.

Hydrographic Surveys

The available maps and charts indicate that in a large part of the intended route, surveys are quite outdated. Except for the southern part, where the South African authorities have mapped the area thoroughly, some areas near the French islands and approach routes to Mozambique, most of the data is rather unreliable. A general survey, covering the entire route completely will form the basis of a safe and secure passage route; detailed surveys of shoals and obstructions will give more insight into the general build-up of the area. It can be seen from the charts that the area is of volcanic nature and shoals may appear very abruptly. Also, changes may occur due to this phenomenon. This means that, although an initial large-scale survey is required on a short term basis, regular surveys will be needed to keep the navigation information up to date and reliable. It is recommended to survey the route with a Multi Beam Echo Sounder, in order to cover the entire area with no risk of missing pinnacles, wrecks, and the like. In the modern survey world, various companies possess extensive capabilities with hull-mounted multibeam systems. The map data will clearly show, apart from the general required bathymetric information, a wide range of active geologic processes, from mass wasting and furrows, to faults and seafloor seepage, in unprecedented detail.

It is recommended to survey the entire route, including a stretch of a width of 10 nautical miles on both sides of the route. Special attention is to be given to shoals, banks and seamounts, as appear in the charts, often with question marks. The approach channels from the routes to the various ports are to be surveyed using the same methodology, while the ports and harbours with their surrounding waters can be surveyed with Lidar based techniques from a small aircraft. This way the entire area can be covered in relatively short time at minimal costs. All data will be submitted in digital form to the appropriate authority for the production of charts and electronic navigation charts. Proper, up to date, reliable navigational charts and electronic navigation charts will encourage the seafarer to follow this route, especially when the route is not (yet) a mandatory one.

Annex 19: Partners' Contributions

Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project

A large number of partners will provide support for implementation of various activities. This annex provides preliminary indications of the proposed amount and nature of their support. Commitments will be further clarified during appraisal.

Indian Ocean Commission (IOC)

The IOC will serve as the subregional project management unit responsible for implementing components B and C and aspects of component D. It will provide in-kind support of office space and office operational costs, secretarial services, and financial management and accounting services required to maintain the project accounts according to Bank guidelines and procedures.

South African Maritime Safety Authority

SAMSA will serve as the regional project management unit, responsible for overall project coordination and for implementing component A and aspects of component D. SAMSA will provide in-kind support of office space and office operational costs, secretarial services, and financial management services and accounting services required to maintain the project accounts according to Bank guidelines and procedures.

International Association of Marine Aids to Navigation and Lighthouse Authorities

The mandate of IALA is to ensure that seafarers are provided with effective and harmonized marine aids to navigation services worldwide to assist in safe navigation of shipping and protection of the environment. IALA will support the project by providing in-kind support to analyze navigational risks, to assess the existing system of aids to navigation, and to recommend the most cost-effective measures to improve the safety of navigation in the region. IALA will also organize workshops, seminars, and training in areas of its expertise.

International Hydrographic Organization

The mandate of the IHO is to ensure that adequate and timely hydrographic information for worldwide marine navigation and other purposes are provided through national hydrographic offices. The Capacity Building Committee of the IHO will assist in developing hydrographic services in the project countries.

United Kingdom Hydrographic Office (UKHO) and Service Hydrographique et Océanographique de la Marine (SHOM)

The UKHO, part of the UK Ministry of Defence, is responsible for providing navigational products and services to mariners in compliance with SOLAS regulations. The UKHO produces standard navigational charts and navigational publications and is a key entity in electronic

charting developments. SHOM, part of the French Ministry of Defense, like its UK counterpart, provides navigational information and produces navigational charts and navigational publications.

The two organizations working together will produce charts and nautical publications of the project-supported marine highway and of select port and port approaches, assist with the training of operators and administrators of the various systems that the project puts in place, and through their involvement in IHO's Capacity Building Committee encourage other states to assist with the overall development and capacity building of surveying, charting, provision of maritime safety information and other related services in the region.

International Maritime Organization

The IMO's mandate is to regulate and promoting on a global basis maritime safety, security, concerning maritime safety, efficiency of navigation, and the protection of the marine environment. It is envisaged that the IMO will play a major role in implementing the project under a UN contract with the two implementing agencies. It will provide the expertise of its staff using its own resources.

Specifically, it is anticipated that under component B, the IMO will:

- Organize and participate in seminars and workshops on issues related to environmental sensitivity mapping, marine navigation safety, prevention of marine and coastal pollution, development and implementation of national contingency plans, use of oil spill equipment, characteristics and effects of oil in the marine environment, and risk assessment and development of appropriate response strategies.
- Assist Kenya, Mozambique and Tanzania to develop national oil spill contingency plans and to become a part of the regional plan.
- Provide expertise to develop an oil spill response manual.
- Assist in the training of the trainers.
- Provide training of country experts in international maritime law.
- Support the development of a methodology to enable governments to carry out baseline studies to identify the key environmental resources of the region and assign indicative values.
- Support the development of a regional database and geographic information system on the marine environment, marine and coastal resources, ship movements, ship waste and sea-based activities.

Under component C, the IMO will:

- Support countries efforts to ratify the IMO conventions intended to protect the marine and coastal environment from pollution from ships and to improve the safety of navigation.
- Assist countries to draft national legislation in accordance with the provisions of these IMO conventions and assist in the formulation of timetables to implement these conventions.
- Facilitate regional agreements and develop a regional contingency plan.

- Help to build the capacity of the organization based in Madagascar that was established under the Western Indian Ocean Oil Spill Contingency Planning Project to be responsible for coordinating a regional response to a major oil spill.

Under component D, the IMO will:

- Support regional workshops to strengthen capacity for port state control.
- Support the widening to include Madagascar and Comoros and support implementation of the existing regional agreement on port state control.
- Support the training of port state control inspectors.
- Support regional training and seminars on maritime traffic management and pollution prevention, and on measures to protect coastal and marine biological resources.
- Help to strengthen the technical capabilities and the institutional and coordinating arrangements among the concerned states to collectively prevent, manage, and respond to transboundary marine pollution.

INTERTANKO and the International Chamber of Shipping

INTERTANKO and the International Chamber of Shipping are industry forums aimed at promoting safe and environmentally-sound shipping. They will encourage their members to equip their vessels with the equipment necessary to fully use the electronic charts, navigational aids, and the maritime safety information transmitted to the vessels.

Recipient governments

The governments of the beneficiary countries will provide in-kind resources during project implementation. Specifically, they will:

- Support relevant staff out of their own resources to participate in seminars, workshops, and training courses.
- Appoint and provide the resources for coordination of activities at the national level, such as an office within a ministry of environment or transport.
- Participate in promotional activities and public awareness campaigns and the like aimed at raising awareness of the project, its benefits, and the role that the public can play to reduce the risk of catastrophic damage from oil and chemical spills.
- Provide support to a regional center in accordance with agreements made during the implementation of the project.

Local oil industry

The local oil companies will participate in the preparation and testing of the oil spill contingency plans for Kenya, Mozambique, and Tanzania. They will participate in the development and testing of the regional oil spill contingency plan. They will pledge the use of their oil spill equipment should this be needed to address an oil spill. They will also send appropriate staff to participate in seminars, workshops, and training exercises to share their insights and expertise.

International oil industry

Similar to the local oil companies, the international companies will participate in the preparation and testing of the oil spill contingency plans and sending their staff to participate in seminars, workshops, and training exercises to share their insights and expertise. They will also install the equipment on their vessels necessary to fully use to the electronic charts, navigational aids, and the maritime safety information transmitted to the vessels. Finally, they will participate in the assessment of the feasibility of the precision navigational system.