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**Resilient Coasts: Strengthening the Resilience of Coastal Socio-ecological Systems in the
Western Indian Ocean**

FINAL DRAFT



Mangroves for the Future
INVESTING IN COASTAL ECOSYSTEMS

WEST INDIAN OCEAN PREPARATORY PHASE

RESILIENT COASTS

**Strengthening the resilience of coastal socio-ecological systems
in the Western Indian Ocean region**

A Partnership Programme



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ACRONYMS

COP	Conference of Parties
CORDIO	Coastal Oceans Research and Development – Indian Ocean
CPUE	Catch Per Unit Effort
EbA	Ecosystem Based Adaptation
EEZ	Economic Exclusion Zone
EIA	Environmental Impact Assessment
ENSO	El Niño / Southern Oscillation
FARI	Forum for Heads of Academic and Research Institutes
GDP	Gross Domestic Product
GNI	Gross National Income
GoM	Government of Mozambique
HH	Household
ICZM	Integrated Coastal Zone Management
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter Tropical Convergence Zone
IUCN CEL	IUCN Commission on Environmental Law
IUCN ELP	IUCN Environmental Law Programme
IUCN ESARO	IUCN Eastern and Southern Africa Regional Office
IUCN GMPP	IUCN Global Marine and Polar Programme
KM	Knowledge Management
LME	Large Marine Ecosystem
MDG	Millennium Development Goals
MEOW	Marine Ecoregions Of the World
MFF	Mangroves For the Future
NAP	National Action Plan (on Climate Change)
NC	Nairobi Convention
NCC	National Coordinating Committee
NCRAP	National Coastal Resilience Strategic Action Plan
NERC	Natural Environment Research Council
PFU	Project Facilitation Unit
PoW	Programme of Work
PRSP	Poverty Reduction Strategy Paper
RSC	Regional Steering Committee
WIO-SAP	Strategic Action Plan for the protection of the Coastal and Marine Environment of the Western Indian Ocean from Land-based Sources and Activities.
SWIOFC	South Western Indian Ocean Fisheries Commission
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
WIO	Western Indian Ocean
WIO-C	Western Indian Ocean – Consortium
WIO-LAB	Western Indian Ocean – Land Based sources and activities
WIOMSA	Western Indian Ocean Marine Science Association

1 EXECUTIVE SUMMARY

1.1 Background

Mangroves for the Future (MFF) was initially catalysed by the December 2004 Indian Ocean Tsunami and led to the development of the MFF-Asia programme. Discussions to extend this programme to the Western Indian Ocean (WIO) soon developed among countries in WIO region, but it was ultimately concluded that a separate MFF-WIO programme would provide a more effective, efficient and regionally relevant approach. This document presents this Programme.

The WIO region spans an area of some 30 million km², equivalent to 8.1% of the global ocean surface. Its combined coastline exceeds 15,000 km² and a total continental shelf area of approximately 450,000 km². The WIO comprises five marine eco-regions which are closely defined by the oceanography of the WIO and it incorporates an estimated 13,000km² of coral reefs, 10,000 km² of mangrove forests as well as large areas of other coastal habitats such as seagrass beds, coastal forests, sandy beaches and rocky shores. The region features a high level of biodiversity, including more than 2,200 species of fish, over 300 species of hard coral, 10 species of mangrove, 12 species of seagrass, over 1,000 species of seaweed, several hundred types of sponge, 3,000 species of molluscs, 300 species of crabs and more than 400 echinoderms. The six main river basins that flow into the WIO from Eastern Africa support highly productive mangrove-estuarine systems that provide nursery grounds and breeding areas for numerous important fishery species and serve as stop-over and wintering habitat for many migratory bird populations.

Over 48 million people, or 1/3 of the total population of the countries bordering the WIO inhabit the coastal areas of the WIO region depend on the goods and services provided by the coastal and marine ecosystems for their livelihoods. The oceans provide fish and other seafood, while coastal systems provide goods such as firewood, timber, wild fruits and medicines. Coral reefs and mangroves also provide important services as breeding grounds for fish and as protection of the coastal zone against storm surges, and are important carbon sinks, while the reefs and beaches are an important tourism draw, contributing to economic development and employment creation.

However, the coastal and marine systems, and with it the livelihoods that depend on them, are facing a number of threats that makes them increasingly vulnerable. Mangrove destruction is taking place at increasingly accelerating rates, with rapid urban development and large scale gas / oil exploration development adding to the ongoing pressure caused by its use for timber and firewood. Damming of rivers affects the mangrove-estuarine systems by altering water flows and sediment loads. Corals are threatened by sea surface temperature rise caused by climate change and by destructive fishing practices. Coastal forests are under threat from continued agricultural expansion, unsustainable use and bush fires.

The institutional capacity in the WIO countries to deal effectively with these threats is generally weak. While good policies are in place in most countries, enforcement capacity is usually inadequate, a situation that is further exacerbated by overlapping mandates between government institutions and generally limited recognition of the important economic role of ecosystems.

At regional institutional level, the Nairobi Convention is supporting regional cooperation in the protection, management and development of the WIO region's marine and coastal environment and has adopted the Strategic Action Programme for the Protection of the Marine and Coastal Environment in the Western Indian Ocean from Land-based Sources and Activities (WIO-SAP), which is also a key reference document for the design of *Resilient Coasts (WIO)*.

1.2 The programme

This Programme will address the high level of vulnerability of ecosystems and livelihoods by increasing their resilience using a “resilience framework” that integrates four components: (i) Ecological and Social Diversity, (ii) Innovative and sustainable infrastructure and technology, (iii) Equitable and resilient governance systems, and (iv) Data and information for adaptive management.

The Programme’s vision is *“Healthy coastal ecosystems for a more prosperous and secure future for coastal communities”*, while the mission is *“To use a partnership-based approach that builds knowledge, supports action on the ground and enhances governance and policy processes in support of building resilience of coastal systems against global change, including climate change”*.

The overall goal is *“to strengthen the resilience of coastal socio-ecological systems in the Western Indian Ocean region”*, which will be achieved by engaging in 4 focal areas: (i) *Strengthen adaptive capacities of local communities dependent on coastal and marine resources;* (ii) *Enhance resilience of critical coastal ecosystems and habitats;* (iii) *Influence coastal economic development to be more environmentally sustainable and socially equitable;* (iv) *Effectiveness of local governance in managing and influencing coastal ecological and social systems improved.* The focus areas are intimately aligned with the Nairobi Convention Strategic Action Plan, and as such the programme will contribute directly to its implementation.

The MFF Programme in the WIO, *Resilient Coasts (WIO)*, will adopt a reef to ridge approach, engaging with territorial waters, river basins and catchments affecting and being affected by coastal systems. Programme activities (Programmes of Work) will be centred around the three the Knowledge-Practice-Policy nexus and will build on lessons learnt from past and ongoing initiatives. A fourth area has been integrated into the Programme that is aimed at the deliberate establishment of mechanisms for the longer term sustainability of benefits realized. The Programme will apply a multi-stakeholder and multi-sectoral approach, bringing together governments, Private Sector (PS), NGOs, academia and community stakeholders involved in marine, coastal and river basin management.

The programme will initially be implemented over a period of 5 years (from 2014 through to 2018). An inception phase of 1 year will be used to set up all programme governance structures, design programme management tools and develop strategic partnerships. During this phase the programme will also identify priority landscapes / seascapes at regional and national scales, through a combination of expert driven analysis and participatory planning processes, using a set of criteria that will be applied across all countries. It is in these priority land-/seascapes that a proposed 3-year implementation phase will support pilot activities in the knowledge, practice and policy realms, whereby the focus will be on adding value to existing initiatives rather than starting completely new initiatives. A 1-year consolidation phase will be used primarily to share lessons learnt and begin scale out (which will include but not be limited to geographical expansion).

The main implementation partners are IUCN, the Nairobi Convention, WIOMSA, CORDIO in collaboration with participating Governments. These organisations also led the development of the Programme as presented here. Following the successful model used by MFF-Asia, strategic regional partnerships with other organisations in the region will be developed, in particular with organisations that can bring added value in terms of expertise, providing knowledge platforms, and contribute to its long term sustainability. At the national and local level, the programme will work as much as possible with existing structures to coordinate and deliver programme activities, while promoting collaboration between government, communities, researchers and the private sector for joint initiatives.

An innovative and complex regional programme such as this one will inherently carry a certain number of risks. Anticipated main risks include the weak functioning of governance structures and partnerships and

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the challenge of maintaining a coherent set of activities that remain strongly linked to the overall framework. Fortunately, this Programme can build on lessons learnt from MFF-Asia to mitigate these and other risks.

Capacity building and gender are incorporated in the programme as cross-cutting issues, and strategies for their effective mainstreaming will be developed during the programme's inception phase. Monitoring of the programme will be guided by the overall logical framework, national action plans and (logical) frameworks for individual activities. At field level, action learning approaches will be promoted, while at national and regional level monitoring will focus on drawing lessons with regard to best practices for resilience building (to be shared with a wider audience) as well as lessons learnt with regard to programme management and delivery mechanisms, as input for adaptive management.

A communication and knowledge management strategy will be developed to promote sharing best practices amongst Programme stakeholders and with a wider audience. The main focus of knowledge management at the national level will be to ensure all partners capture lessons learnt from their activities and to repackage those for national learning events and regional sharing. At the regional level, the core hub for knowledge management will be a website in which all knowledge products will be brought together for easy access by Programmatic stakeholders and external audiences. Other stakeholders will be invited to share their knowledge products on coastal systems and resilience building, with the aim of making the website a true repository of all regional knowledge on coastal systems.

2 Introduction

Today's world is increasingly complex and unpredictable. With rapidly changing demographics, economies and climates in a globalized world – we can no longer afford to engage as “business as usual”. Effective responses are required at multiple scales and by multiple actors. To adapt to changing circumstances communities are required to, for example, have higher levels of flexibility and be willing/able to change occupations/locations; be better able to plan, learn and reorganize; and have access to resources they require to do so. Institutional frameworks need to be supportive of community efforts to adapt – from local authorities to national financial planning processes. Coastal zone managers need to work with development sectors, such as mining, agriculture and tourism to mitigate against potential and actual threats and adapt to changing climates, restoring and protecting natural coastal ecosystems such as mangroves and coral reefs, that can provide cost effective natural buffers and assist in managing human-induced stresses.

Engaging with this complexity requires adaptive management approaches and strengthening the resilience of socio-economic, ecological and institutional systems to stresses and shocks. There are a number of ecosystem based management approaches available that provide a comprehensive framework to enable us to do so. However, implementing these approaches in reality has not been without numerous challenges and while approaches such as integrated coastal zone management (ICZM) are recognized as sound approaches to sustainable coastal development, they are far from becoming a routine process in the WIO region¹. Sectoral and programmatic initiatives by and large continue to operate in silos, with limited exchange and collaboration between them and the need for cross-country and regional exchange is greater than ever, given that all countries share ecological, socio-economic and political driving forces².

2.1 Programme Origins

Mangroves for the Future (MFF) was initially catalysed by the December 2004 Indian Ocean Tsunami, which emphasized the links between coastal ecosystems and human livelihoods as well as concerns for longer term coastal ecosystem management and coordination and collaboration between institutions and Governments. Recognizing the need to maintain the momentum and partnerships created during the response to the Tsunami, the IUCN Asia Regional Office (ARO) and UNDP initiated the establishment of a regional platform for action in 2006 on the basis of an extensive consultative process involving over 160 institutions, with assistance from the Office of the Special Envoy for Tsunami Recovery (OSE), the former President of the US, Bill Clinton. Given the success of the MFF initiative, Kenya and Tanzania officially applied to become dialogue countries in May/June 2009. After several discussions and consultation with the Regional Steering Committee (RSC) members, it was decided that Kenya and Tanzania would not join as full members in Phase 2. Instead, a model of creating an independent MFF in the Western Indian Ocean was suggested as a more effective, efficient and regionally relevant approach.

In November 2010, the IUCN eastern and southern Africa regional office convened the first stakeholder workshop involving Government and Non-Government representatives from Kenya, Mozambique and Tanzania to initiate discussions around the development of a programme of work specifically focusing on the Western Indian Ocean. This gave rise to a concept note for the preparatory phase. It was also agreed during the workshop that the development of the programme would be spearheaded by a consortium of

¹ Raphaë Billé and Julien Rochette. 2010. Feasibility Assessment of an ICZM Protocol to the Nairobi Convention: To the Parties of the Convention. COI/ReCoMAP and the Nairobi Convention Secretariat. February 2010

² Ibid

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partners comprising of the IUCN eastern and southern Africa Regional Office, Nairobi Convention Secretariat, the Western Indian Ocean Marine Science Association (WIOMSA) and CORDIO East Africa (CORDIO EA).

The preparatory phase was formally initiated in September 2012, with support from the Swedish International Development Corporation Agency (SIDA) through the UNEP Africa Marine and Coastal programme which is executed by the Secretariats of the Nairobi and Abidjan Conventions. The initial concept note was presented for consideration to and endorsed by member states of the Nairobi Convention during COP7, held in Maputo, Mozambique in December 2012, as per decision CP7/13. Thereafter, a desk-based analysis of the socio-ecological context as well as an institutional analysis was carried out and a regional consultant contracted to assist in using this initial analysis to develop the programme framework. Identification of core issues and the initial programme design presented in this document are based on stakeholder consultations carried out through national workshops and one to one interviews conducted in the three countries – Kenya, Mozambique and Tanzania.

This document is the final draft, discussed at the regional stakeholders' workshop in June 2013 and the High level decision makers meeting in August 2013

2.2 Programmatic scope and focus

The Mangroves for the Future Programme in the Western Indian Ocean (MFF-WIO) is centred around enhancing the resilience of coastal systems. Subsequently, it has been proposed that the title for the Programme “Resilient Coasts – WIO” more accurately captures the nature and intent of the Programme. This Programme is therefore referred to as Resilient Coasts (WIO) henceforth, with the understanding that it has been developed within the framework of the MFF-Asia Programme and adapted to the needs of the WIO.

The Programme views mangroves as a flagship species, in light of their multiple roles, benefits and uses to coastal ecosystems and people. More importantly, mangroves represent the significance of the inter-linkages between ecological processes at broad spatial and temporal scales – enabling us to better understand and engage with holistic, landscape based approaches.

Initially, *Resilient Coasts (WIO)* will be piloted in three countries, Kenya, Mozambique and Tanzania with the Seychelles³ and other interested countries invited to engage as dialogue partners to share lesson and experiences. It will adopt a reef to ridge approach, engaging with territorial waters⁴, river basins and catchments affecting and being affected by coastal systems. *Resilient Coasts (WIO)* will seek to scale out over time beyond these three countries to gradually encompass all biogeographically related countries of the region. To do so, it will draw upon Obura's (2012) recent analysis, based on the diversity and distribution of reef-building corals, which revises Spalding et al. (2007)'s definitions of Marine Ecoregions of the World (MEOW). While this analysis is based on corals, there are no similar regional socio-economic or ecosystem-based analyses on other habitats in the WIO. Obura's results point to the importance of the region's oceanography and this is likely to be equally important for other marine habitats.

³ Seychelles has been involved in the MFF Asia programme for a number of years now

⁴ Territorial waters are generally defined as within 12nm and available exclusively for citizens and residents. In contrast, the EEZ waters outside the 12nm zone are reserved for foreign exploitation of fisheries and minerals, including oil and gas.

3 Context

3.1 The WIO region – An area of global significance

The WIO region (Figure 1) extends from approximately latitude 12°N to 34°S and longitude 30°E to 80°E, an area of some 30 million km², equivalent to 8.1% of the global ocean surface. Its combined coastline exceeds 15,000 km² and a total continental shelf area of approximately 450,000 km².



Figure 1 - Map of WIO region (Source: UNEP, 2009)

The WIO comprises five marine eco-regions (Obura 2012, Spalding et al. 2007) which are closely defined by the oceanography of the WIO (Figure 2, Table 1) with its five distinct ocean circulation patterns of which three: i) the South Equatorial Current; ii) the Comoros gyre and related eddies in the Mozambique channel; and iii) the East African Coastal Current, are driving currents in this marine system (Scott and McCreary 2001). The eco-regions were defined by Obura (2012) based on the distribution of hard coral species, and give prominence to the oceanographic linkages across the Mozambique Channel. These ocean circulation patterns play an important role in conferring greater resilience to climate change in different areas of this region illustrating the importance of regional management and conservation planning approach (e.g. Obura et al. 2012).

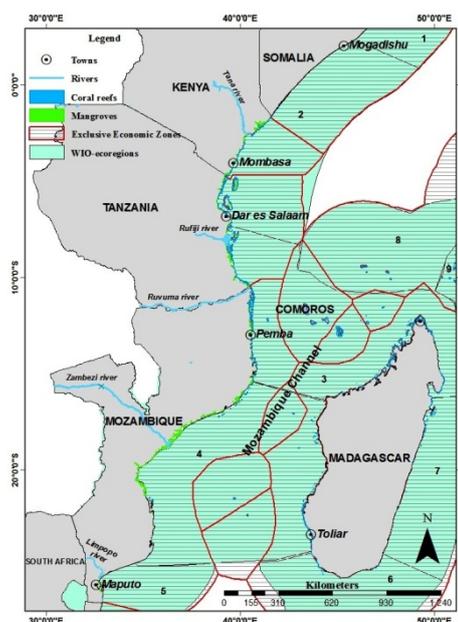


Figure 2 Map of the western Indian Ocean showing eco-regions (©Cordio 2013)

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Table 1 - Marine eco-regions in the WIO (*Obura 2012*)

No.	Geographic range
1	Somalia
2	Southern Somalia, Kenya, northern Tanzania - monsoon coast
3	Northern Mozambique Channel: southern Tanzania, northern Mozambique
4	Southern Mozambique Channel: central-southern Mozambique
5	Delagoa: southern Mozambique, northern South Africa

The WIO encompasses a large array of marine and coastal settings, ranging from small volcanic and coral islands to large continental countries with extensive coastlines and tropical and subtropical climates. The WIO's diverse coastal and marine ecosystems, which include coastal lowland forests, mangroves, seagrass beds and coral reef, support the productivity of the large marine ecosystems (LMEs), including fisheries. The region features a high level of biodiversity, including more than 2,200 species of fish, over 300 species of hard coral, 10 species of mangrove, 12 species of seagrass, over 1,000 species of seaweed, several hundred types of sponge, 3,000 species of molluscs, 300 species of crabs and more than 400 echinoderms. The region also sustains unique taxonomic groups, zones of high endemism as well as a suite of highly vulnerable and unusual species such as coelacanths, whale sharks and sawfishes, five of the world's seven species of marine turtle and more than 38 cetacean species. The total coral reef area is estimated at 13,000km², mangrove forests covering 10,000 km² as well as large areas of other coastal habitats such as seagrass beds, coastal forests, sandy beaches and rocky shores (UNEP, 2009).

The many river basins in the region, among which 12 major ones, have highly variable flow rates and sediment loads. Freshwater discharges from these rivers have a profound effect on the marine ecosystems in the region, driving various ecological processes and providing nutrients to sustain living marine resources, their coastal estuaries serving as habitat and nursery grounds for numerous fish and crustaceans.

The coastal and marine ecosystems provide essential sources of livelihood and income for numerous coastal inhabitants, and contribute to the growing economies of countries in the region. Over 48 million people, or 1/3 of the total population of the countries bordering the WIO inhabit the coastal areas of the WIO region (World Bank 2010), many of them dependent on the goods and services provided by the coastal and marine environment for their livelihood. It is estimated that the total value of the goods and services provided by the WIO coastal and marine habitats amounts to over 25 billion US dollars per year (UNEP, 2009), but potentially more⁵. Tourism is the largest source of income that is directly linked to the coastal and marine environment; the region's beautiful sandy beaches, mangrove forests, lagoons and coral reefs attract over 20 million tourists from all over the world every year, injecting more than 6 billion US dollars per year into the economies of WIO region. In general, tourism arrivals in sub-Saharan Africa have increased by 8% over the past 15 years, therefore providing an important economic growth sector.

The coastal and marine waters of the WIO, and in particular its coastal waters, lagoons, estuaries and continental shelves are also important fishing grounds. According to official statistics, the region generates about 4.8 % of the global fish catch, equivalent to about 4.5 million tonnes of fish per year (UNEP, 2009), although this is likely to be an underestimate due to the under-reporting of catches by some of the countries. While not as productive as some other well-known fishing grounds in the world, the WIO

⁵ For instance in the Republic of South Africa the estimated value of direct benefits obtained for all coastal goods and services amounted to R168billion in 2000, while indirect benefits contributed a further R168billion (UNEP 2011)

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fisheries sector is still of high importance in terms of food security, employment, and income generation for the growing coastal population. Furthermore, mangroves, seagrass meadows and coral reefs provide coastal protection, as well as food and shelter for fishes, crustaceans, molluscs and other organisms of immense ecological and commercial value.

3.2 Pilot Countries: Kenya, Tanzania and Mozambique

While the WIO region comprises 5 African mainland states (Somalia, Kenya, Tanzania, Mozambique and South Africa) and 5 island states (Mauritius, Comoros, Seychelles, Madagascar and Réunion (France)), the *Resilient Coasts (WIO)* will initially be piloted with three key mainland states of Kenya, Tanzania and Mozambique (hereafter referred to as pilot countries). This is primarily due to the fact that the Programme originated as a result of the initial interest expressed by Kenya and Tanzania and, thereafter, Mozambique. In light of the inter-linkages between ecosystems and biomes across the borders of the three countries; the fact that they are home to approximately 52% of the total coastal population of the WIO region, 65% of all mangroves in the region; and, given the rapid economic development taking place along the coast line (including oil and gas, mining and infrastructure development) – the three countries provide a strategic starting point for testing and piloting the Programme.

Table 2 - Main biophysical and geographic characteristics of Kenya, Tanzania and Mozambique (CORDIO, 2013)

Country	Coastline km	Territorial waters km ²	Continental shelf km ²	EEZ million km ²	Major rivers and length, km	Rivers MAR ⁱ	River sediment load Mt.yr ⁻¹	Coral reef area km ²	Mangrove area km ²	Seagrass area km ²
Mozambique	2,470	70,894	73,300	0.493	Zambezi – 2,650 Limpopo – 1,750	67-190 13	22-43 10-34	1,860	2,909	439
Tanzania	1,424	36,578	17,903	0.204	Ruvuma – 800 Rufiji - ~ 600	96 N/A	N/A 15-17	3,580	1,287	N/A
Kenya	536	12,832	8,460	0.104	Tana – 1,102 Sabaki - 650	38 35	6.8	630	610	33.6



Figure 3 - River basins Eastern Africa
(source: UNEP 2009)

The northern part of Mozambique, Tanzania, Kenya and southern Somalia receive long and heavy rains during March to May before the strong south east monsoon winds set in. Short rains are experienced from around October to December heralding the start of the lighter north east monsoon winds. However, this monsoonal pattern has become less predictable in recent years bringing more erratic rainfall and less consistent monsoon periods, as mentioned frequently by coastal communities whose lives are closely aligned to these weather patterns. Further south in Mozambique the climate shifts between tropical and sub-tropical regimes and cyclones are a feature of the southern Mozambique Channel. This southern weather pattern is driven by the Agulhas current, and is characterised by one long rainy season from around December to April, with tropical storms developing regularly in the Mozambique Channel.

There are a large number of river basins in Eastern Africa that flow into the WIO (Figure 2), of which the 6 main ones are: the Tana and Sabaki rivers in Kenya, the Rufiji and Ruvuma in Tanzania and the Zambezi and Limpopo in Mozambique, with the Ruvuma marking the boundary between Tanzania and Mozambique. The Zambezi and Limpopo are two of the nine largest river basins in Africa.

3.3 Habitats & species – Wide variety with rich biodiversity

Eastern Africa is characterised by coastal and marine ecosystems that include rivers and estuaries, coral reefs, mangrove forests, seagrass beds, sandy and/or muddy beaches and bays and rocky headlands. This variety of tropical coastal habitats confers rich marine biodiversity with over 6,000 species documented.

3.3.1 Mangroves

Mangrove forests occupy some of the largest areas of all coastal habitats in Mozambique, Tanzania and Kenya, typically in river estuaries, with smaller stands in reef lagoons and on open sea coasts. Together, these countries account for around 65% of all mangroves in the WIO region, with Mozambique accounting for 42%, Tanzania 18% and Kenya 6% (numbers based on UNEP, 2009).

The most extensive and diverse formations are found in the slightly wetter coastlines that extend along the central coastline of Tanzania and in central Mozambique, notably around the large and highly productive deltas of the Tana (Kenya), Rufiji (Tanzania) and Zambezi (Mozambique) rivers, with up to 10 different species found in these areas.

Within Eastern Africa, mangrove decline is estimated to have been about 8% from 1980 to 2005, compared with global projections of 25% decline by 2025 (Samoilys et. al, 2013). Thus it appears that the mangrove systems of eastern Africa are less impacted and are in relatively good health compared with the rest of the world. However, mangrove destruction is taking place at increasingly accelerating rates, with rapid urban

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development and large scale gas / oil exploration development adding to the ongoing pressure caused by its use for timber and firewood and clearing for other locally important land uses like salt pans. In all three countries, mangroves have partial protection (as forest reserves in Tanzania and Kenya, and with similar protection status in Mozambique⁶) but this has not been able to stop their decline.

3.3.2 River basins and estuaries

The 6 main river basins of Eastern Africa that flow into the WIO (see figure 3) provide significant water discharge to the sea reflecting their rainfall catchments inland. The long rains contribute the maximum river discharge in terms of water flow and sediment load and, together with river length and hence extent of catchment, this is intimately linked to the size of the river estuaries and the mangroves forests associated with them. The largest river discharge is found in the rivers of Mozambique which support extensive mangrove forests. These mangrove forests are also often associated with seagrass beds in shallow protected waters usually in bays. These mangrove-estuarine systems are highly productive due to a combination of nutrients flowing from upstream and because they provide nursery grounds and breeding areas for numerous important fishery species. In addition, many migratory bird populations rely on river deltas, wetlands and mangroves as stop-over and wintering habitat.

All the major rivers of the three countries have been dammed to varying extents for hydropower, or water supply or irrigation. Baseline data prior to dams are scant and therefore quantified estimates of the reduction in ecosystem health and productivity of these mangrove river basin systems are not available. Nevertheless, the relative health and productivity of these major river basin mangrove ecosystems is good. Based on these factors, the relative size of the deltas, their productivity and close links with neighbouring seagrass beds and coral reefs, four river basins/deltas are considered as regionally and nationally most significant: Zambezi, Ruvuma, Rufiji and Tana.

3.3.3 Coral reefs

Coral reefs dominate the coastal ecosystems of the WIO and are widely distributed along the Kenyan, Tanzanian and Mozambican coasts. They are typically shallow fringing reefs, often enclosing a lagoon, and often closely associated with seagrass beds. The reefs in southern Tanzania at Mnazi Bay and in northern Mozambique in Cabo Delgado are the exception, where reefs are more developed, covering extensive submerged areas, are less associated with seagrass beds and are also deeper.

Corals are threatened by sea surface temperature rise caused by global warming which bleaches corals and eventually kills them if higher water temperatures persist. This threat has been well documented in the Western Indian Ocean. Levels of coral bleaching from the extreme temperature event during the 1998 El Nino and the subsequent recovery of coral reefs has been quantified in the WIO and show that recovery rates and resilience to bleaching vary considerably within the region with the northern Mozambique and southern Tanzanian coral reefs appearing to be the most resilient or to recover the most quickly.

While Tanzania has by far the largest area of coral reefs within the WIO region, many of its reefs have been largely destroyed by the extensive use of dynamite for artisanal fishing. This practice is seriously undermining Tanzania's marine biodiversity, coastal productivity in the form of fisheries, and also shoreline protection. Conversely, Kenya has the smallest area of coral reefs in the region but they are some of the most effectively protected and managed, while the reefs in northern Mozambique are one of healthiest

⁶ Part of the mangroves in the Zambezi Delta have stronger protection as they are part of a Ramsar site.

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and most resilient coral systems in the WIO and are therefore recommended for World Heritage nomination.

3.3.4 Seagrass beds

Of the 60 seagrass species identified globally, there are 13 species spread across the WIO region, but the highest number of 12 species per country is found in Eastern Africa. Extensive seagrass beds are characteristic of all three countries, although accurate data are scarce. Mozambique has an estimated total area of 439 km² of seagrass beds and Kenya only 33.6 km² (CORDIO et al, 2013), with little data available for Tanzania. Seagrass beds are closely associated with the shallow fringing coral reefs of the narrow continental shelf of the three countries where seagrass beds occur in the back-reef lagoons and bays with narrow channels connecting the lagoons with the sea.

Seagrass ecosystems have so far received little conservation and management attention, yet they are amongst the most productive aquatic ecosystems: they provide important habitats for a diverse array of associated fauna and flora such as macro-algae, benthic invertebrates, sea urchins, various shrimp, lobster, crab, starfish and sea cucumber and over 100 fish species. They are important as nursery grounds and as foraging areas for dugong, turtles and fish; and provide predation refuges for numerous fish and invertebrate populations. Due to their high productivity and trapping of carbon in biomass and sediment trapping, seagrass beds are also among the most significant shallow marine carbon sinks, storing up to 500 tonnes/ha, equivalent to the amount of carbon stored in primary tropical forests.

The greatest threats to the seagrass beds of Eastern Africa are fishing such as trawling or active seine netting (e.g. beach seines) and, similar to mangrove, coastal infrastructure development such as the proposed Lamu port in northern Kenya and the gas / oil development in southern Tanzania and northern Mozambique. Seagrass ecosystems are also vulnerable to nutrient-enrichment and reduced visibility caused by upland forest clearing and land degradation in river basins.

3.3.5 Coastal forests

Though tiny and fragmented, coastal forests are important biodiversity areas and are listed as a hotspot by Conservation International. The forests are home to a variety of mammals (around 200 species of which 11 endemic), 633 bird species (11 endemic), around 4,000 plant species and large numbers of reptiles, amphibians and freshwater fish (CORDIO et al, 2013). Coastal forests also play an important role in carbon sequestration. The forests are found inland from the coast with outliers occurring along rivers and several locations where it grades into sub-mountain forests at the foothills of mountain ranges. Areas between the forests have different characteristics depending on the country in question: in Kenya it is mainly farmland, in Tanzania and Mozambique it is generally savannah woodland/thicket, but with farmed areas increasing.. Continued agricultural expansion, unsustainable use and bush fires are some of the biggest threat facing the coastal forests.

3.3.6 Species

The above described habitats supports a large number of species, some of which are of critical concern i.e. rare and endemic groups as well as those that are threatened by over-exploitation or by the destruction of their natural habitat. Table 3 provides a summary:

Table 3

Species	Description	Threats
Coelacanth	A "living fossil", with status of critically endangered. Two known	Accidental mortality (by-catch)

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	species in WIO region	
Marine mammals	Whales, dolphins and dugong	Dolphins are threatened by entanglement in gill nets. Of 8 whale species in WIO, three have the status of “threatened”, with main threat being mortality caused by accidental by-catch. Dugongs are a threatened species, and occur mostly in areas with seagrass beds, with biggest concentration near Bazaruto Archipelago Mozambique. Threats include habitat loss, and accidental mortality.
Sharks and rays	Shark species include whale shark, great white, Zambezi shark, several reef sharks.	Are threatened by market for their fins. Many are listed on IUCN Red list, and some sharks / rays have recently been added to the CITES list
Turtles	Five species found in WIO region	All five species are featured on the IUCN Red List of Threatened Animals, with the hawksbill and leatherback listed as ‘critically endangered’ and the green, loggerhead and olive ridley as ‘endangered’. Main threat is disturbance of nesting sites (beaches).

Other species of critical concern include seahorses, sawfish, groupers, coconut crabs and some coral species and shells, in particular those are harvested for the curio trade.

3.4 Coastal livelihoods – Socio-economic status

3.4.1 Overview

The coastal population in Eastern Africa has been steadily increasing through decreased infant mortality and through immigration to the coast from inland, possibly due the perception that the coast offers better livelihood opportunities. Nevertheless, the percentage of the total population that lives within 25 km of the coast differs considerably between the countries: from 32.7% in Mozambique and 13.6% in Tanzania to only 6.1% in Kenya (UNEP, 2009). It makes Mozambique the country with the highest percentage of population living in the coastal zone in the whole WIO region. However, Mozambique has the lowest population density along the coast, at around 113 persons / km² within the 25 km coastal strip, compared to around 154 for Tanzania and 171 for Kenya (see Table 4).

Overall population growth numbers for the three countries oscillate between 1.96% (Tanzania), 2.1% (Mozambique) and 2.6% (Kenya) (CORDIO et al, 2013). Growth in the coastal areas is assumed to be higher, since many of the coastal zones of Eastern Africa have experienced an influx of new residents related to rapid expansion of economic activities. Population growth in coastal areas places heavy demands on inshore marine ecosystems, notably seagrass beds, coral reefs and mangrove forests, leading to damage and depletion of some species. All three countries have some form of coastal infrastructure development, much of which is related to urban development and economic activities such as tourism, ports and harbours, industry, mining, road and railway transport.

Poverty levels are high in all three countries, both in terms of Gross National Income (GNI) per capita, and in terms of Human Development Index, with Mozambique the poorest country in the whole WIO region with a GNI per capita of USD 690 and an HDI score of 0.384 (UNEP, 2009, see Table 4).

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In all three countries poverty in rural areas, including most of the coastal zones, is much higher than in urban area. Estimated poverty levels⁷ in rural areas, according to the MDG indicator monitoring website, range from 37% in Tanzania (2007) and 49 % in Kenya (2005) to 56.9% in Mozambique (2008). Specific data for Kenya show that poverty levels in the coastal areas there are considerably higher than the national rural average with an estimated 62% below the poverty line (NERC, 2008). While poverty levels have been gradually reducing in Tanzania and Mozambique, the percentage of rural poor has remained largely unchanged in Kenya in the last two decades.

While coastal poverty fits generally into the patterns of rural poverty, there are some distinguishing features. Many coastal resources are less dependent on short-term weather patterns than terrestrial resources, allowing more reliability, although the ‘fugitive’ nature of other marine resources, particularly fish, adds a level of uncertainty to coastal livelihoods. The open-access nature of many coastal resources, while providing opportunities for people without property or capital, also opens the resource to competition or to expropriation for other uses, including tourism or conservation. This may aggravate the historical trend of diminishing access to resources among the poor, as demand for them increases, leading to situations whereby artisanal fishers are forced to resort to using illegal gear or fishing in protected areas.

The overall livelihoods strategy of coastal households is one of diversification. Many households will be involved in both fisheries and agriculture/animal husbandry (the main livelihoods strategies), using part of the production for self-consumption and selling any surplus to provide income for essential services such as access to health, payment of school fees and the like⁸.

Table 4 lists some demographic and development indicators for Kenya, Tanzania and Mozambique.

Table 4- Demographical and development indicators (derived from UNEP, 2009; CORDIO et al, 2013)

Country	Area	Pop. 2007	% Coastal population – 2000 / Population density			GDP 2007	GNI Per Capita 2007	HDI	Pop. growth 2007	Life expectancy 2006
			<25 km	<75 km	<100 km					
	km2	millions				billion US\$	US\$		%	
Kenya	582,650	37.53	6.1 / 171	7.5 / 70	8 / 56	29.51	1,540	0.521	2.6	53
Mozamb.	801,590	21.37	32.7 / 113	52.1 / 60	59 / 51	7.75	690	0.384	1.9	42
Tanzania	945,087	40.43	13.6 / 154	17.3 / 65	21 / 60	16.18	1200	0.467	2.4	52

3.4.2 Socio-economic activities

The main economic activities along the coastal areas of Eastern Africa are fisheries, tourism, agriculture, forestry, mining and industrial activity such as processing factories, and infra-structure development. Part of the coastal areas are excluded from economic activities because of their inclusion in conservation areas. The main economic activities are described in more detail below.

Fisheries

Fisheries is usually subdivided in small-scale, or artisanal, fisheries and the larger scale commercial and industrial fisheries. The coastal population in Eastern Africa is mostly involved in the small-scale fisheries,

⁷ Defined as proportion of population below US\$ 1 per day, as per Millennium Development Goals indicator

⁸ Note that water for domestic use is a “free” commodity in most areas, a situation that leads to lack of maintenance of boreholes and wells, which in turn forces the population to use water from inland lagoons, dams and rivers

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with only a small percentage of fishers having the means to graduate to commercial fishing (e.g. using larger motorised boats, more advanced gear, carrying ice to preserve the fish).

In the three countries, the small-scale fisheries supplies between 93 and 98% of total marine catch⁹, and is the main livelihoods activity for a large number of coastal HHs, in particular in Mozambique where it employs an estimated 334,000 people (of which around 280,000 fishers and the remainder working in fish processing) (GoM, 2007). Of the total annual estimated marine catch in Mozambique of around 160,000 tonnes (2010) around 85% comes from the artisanal fisheries, representing a monetary value of at least USD 200 million (GoM, 2011).

The coastal area in Tanzania supports around 56,000 artisanal fishers (UNEP, 2009), while in Kenya it employs around 10,000 people and generates an estimated US\$ 3.2 million per year (NERC, 2008). Population growth, along with high levels of poverty in the coastal regions, has contributed to increases in the number small-scale fishers in all three countries. This has, in turn, placed great strain on fish stocks along the coast, resulting in the over-exploitation of fisheries resources and reduced Catch Per Unit Effort (CPUE). Overall total fish catches have been increasing steadily but this is now levelling, indicating the maximum harvest potential may have been reached.

Some of the main constraints in the sector are the lack of processing facilities to create added value (in particular in Tanzania and Mozambique), and poor connection with markets due to inadequate infrastructure. Destructive fishing techniques, such as the use of nets with small mazes and the widely-spread practice of dynamite fishing in Tanzania, threaten both the fish resources and related ecosystems (coral reefs in particular) as well as the livelihoods of the people depending on them.

Mariculture

At present, mariculture is only practised in a few places along the Eastern African coast, as opposed to the situation in much of Asia where it is widely practised. All three countries have been experimenting with mariculture, but these efforts have been hampered by problems such as lack of training, theft, conflict with other coastal users, lack of hatcheries, limited research and generally a not very conducive enabling environment. Most mariculture activities are concentrated in Tanzania, where finfish, seaweed and mud crab being farmed in all coastal regions, and pearls and prawns being farmed in some places like Mafia and Tanga.

The potential for mariculture is considered high, since environmental conditions, suitable land, brood stock, export infrastructure and labour are available in the three countries, with in particular Tanzania and Mozambique providing good opportunities for shrimp farming.

Agriculture & forestry

Agriculture has always been the mainstay of the economies in Eastern Africa, and is also practised by many of the coastal households. With soils and climatic conditions generally less favourable along the coasts (except near river estuaries) than in the hinterland, most agriculture is subsistence-based rainfed crop production, often combined with livestock rearing. Farm sizes of subsistence farmers vary from an average of 6 hectares in Kenya to around 1 to 2 hectares in Tanzania and Mozambique (NERC, 2008). The importance of agriculture for coastal livelihoods has often been underestimated, with policies for coastal areas focusing primarily on the fisheries sector. This is now slowly changing with agriculture receiving more attention in integrated coastal management approaches.

⁹ It should be noted though that in Tanzania and Kenya, freshwater fish catches are much more important than marine catches.

Coastal forests and mangroves are important sources of timber and firewood for the coastal communities. Coastal forests also provide non woody products that are traded by local communities and contributing to improvement of their livelihoods, including bee products, food, fruits, nuts, medicinal plants, gums, resins, barks, thatch grasses, natural dyes, aromatics and fibre.

Increasingly, coastal forests are being cleared for agricultural purposes, not only for subsistence farming but also for larger plantations, often near rivers to allow for irrigated crops. Similarly coastal wetlands are often converted into rice fields or sugar cane plantations. Mangroves are being exploited for timber, firewood and even charcoal production.

Tourism

Tourism is a growing sector and the coastal areas of Eastern Africa have seen the number of tourists grow substantially over the last decades. In Kenya, coastal tourism now contributes around 60% of overall tourism earnings, while in Mozambique almost all tourism is related to the coastal areas and contributed to an estimated 3.2% of GDP in 2003, while employing around 350,000 people (roughly the same number of people as employed in artisanal fisheries) (NERC, 2008). Tourism in the Tanzanian mainland is concentrated around wildlife-based tourism in the hinterland, but coastal tourism is an important income earner for Zanzibar.

Tourism development has been suffering from political instability (such as in 2007 in Kenya), natural disasters (floods in Mozambique in 2000) and from a lack of coordination at national policy levels, which leads for example to increased fees for visas and other red tape that do not contribute to a conducive environment. Revenues from tourism activities have also been less than optimal, largely because much of the tourism industry is run by foreign companies, with much of the tourism payments and profits being handled and kept outside the country that actually provides the tourist attraction.

Other economic activities

Mining, ports and the emerging gas / oil industry are the main other economic activities in the coastal zones. Mining activities are taking place in all three countries, with the largest scale mining in northern Mozambique where mineral-rich dunes (heavy sands) are being mined. Coastal mining in Tanzania and Kenya is mostly focused on cement, coral, sand and lime.

The discovery of large gas reserves near the coasts of south Tanzania and northern Mozambique will have a huge economic impact. While it will create many employment opportunities, it is questionable in how far coastal households will be able to benefit from these opportunities, since education levels are low. The influx of workers and money in these hitherto isolated areas will also have a huge social impact, with people being displaced and the social fabric of coastal communities likely to suffer.

3.5 Linkages between ecosystems and with livelihoods

There are strong linkages between the various coastal and marine ecosystems as well as with river basin ecosystems. However, the role of river basins, estuaries and mangroves as ecosystem service providers to a broad diversity of other systems (e.g. coral reefs, fisheries, land protection) is generally poorly recognised in the legislation, institutions and social systems of east African coastal communities and governments.

These ecosystems provide different type of services as depicted in Figure 4.

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Provisioning	Regulating	Cultural
<ul style="list-style-type: none"> • Food/ fish • Timber/ fuel • Building materials • Curios • Fibre • Medicines • Genetic resources 	<ul style="list-style-type: none"> • Atmosphere and climate regulating • Hydrological balance • Disease control • Waste assimilation • Erosion control • Storm/flood protection 	<ul style="list-style-type: none"> • Recreational • Spiritual and religion • Aesthetic • Inspirational • Educational • Heritage • Research
Supporting <ul style="list-style-type: none"> • Nutrient cycling • Primary production • Provisioning of habitat • Supporting life cycles 		

Figure 4 - Services provided by coastal and marine ecosystems (UNEP, 2009)

Mangroves are among the most productive habitats on earth and have tremendous social and ecological value. Wood production and growth rates of mangrove species are very high. They provide sheltered nursery grounds for many fish and invertebrate species that spend their adult lives in other coastal and pelagic ecosystems. More indirect ecosystem goods and services include the role of mangroves as nurseries for economically important fisheries, especially for prawns; filtering and trapping of pollutants, stabilisation of coastal land by trapping sediment and protection of shore lines against storm damage. Mangroves are also important carbon sinks. Their primary production is intimately linked to river basins that discharge into the ocean, since they depend on these discharges for the seasonal influx of nutrients. Mangroves provide direct provisioning services to the population in the form of timber and fuel wood.

The continued damming of river basins for hydropower, water supply or irrigation, has negative impacts on water flow and nutrient discharge to the coast, and this directly affects mangrove growth and hence productivity and provision of ecosystems services, which in turn has negative consequences on associated valuable fisheries.

Coral reefs are known to provide main ecosystem services. These include coastal shore protection against storms and floods, nursery area for offshore fish, lobster etc. and support to primary production since coral reefs create a productive ecosystem in a “nutrient desert”. When combined with mangroves, river estuaries and seagrass beds, coral reefs are highly productive ecosystems. Direct provisioning services for the coastal population include their relevance for artisanal fisheries and the high tourism potential.

Coastal forests and associated grasslands provide numerous direct benefits for the population, including timber, firewood, charcoal, wildlife, medicinal products, fruit, honey, insects and products used for curios. Coastal forests are major sources of primary production, acting as carbon sinks and oxygen generators. Forests and grasslands provide habitat for a large biomass and a great diversity of species, many of which spend all or major parts of their life cycle in this ecosystem. Nutrient cycling is a particular benefit, especially in the process of creating fertile organic matter.

Seagrass beds are a common but inadequately studied ecosystem, despite the great benefits that are generated. Subsistence fishers and gatherers (often women) collect food from seagrass beds, especially during the low tides. These products include fish and shellfish, worms, sea cucumbers for export, clams, oysters and numerous other living marine species. In many cases the beds generate fishes such as seahorses and ornamental shells. Seagrasses contribute to atmospheric regulation and carbon

sequestration through their primary production. Sediment and waste assimilation (thus clearing the water), storm protection and erosion control (through their ability to attenuate waves) are also important regulating services provided by seagrass.

3.6 Global trends

3.6.1 Climate change

Climate change and variability in the WIO region is already influencing rainfall patterns, evidenced by the frequency and intensity of extreme weather events, while increased sea water temperatures have already led to widespread bleaching of coral reefs.

In the decades ahead, projections from IPCC suggest that Eastern Africa will see annual temperatures rise by 1.8°C to 4.3°C (with a mean of 3.2°C) by the period 2080-2099. Warming is likely to be greatest during the period of June to August (IPCC, 2007) and will affect inland areas more than the coastal zones. Projected changes in precipitation patterns are less clear, due in large measure to uncertainty regarding how the inter-related processes of the ICTZ, tropical monsoon and ENSO patterns will be altered in a warmer world. Available reports, however (as synthesized in the 2007 Assessment Report of the Intergovernmental Panel on Climate Change), suggest that the region will likely experience an increase in average precipitation over the region. However, this increase will be accompanied by greater seasonal variation in rainfall patterns, a possible increase in the occurrence of intense precipitation events, and increased frequency of drought. It is expected that the El Niño and La Niña phenomena will also become more pronounced.

A detailed study for Mozambique (World Bank, 2010) concluded that sea level rise in combination with increase in storm surges, as direct consequences of human-induced climate change, has significant implications for low-lying coastal areas and beyond, including major direct impacts—inundation of low-lying areas, loss of coastal wetlands, increased rates of shoreline erosion, saltwater intrusion, higher water tables, and higher extreme water levels, which lead to coastal flooding. Using the IPCC mid-range estimates for sea level rise, the report estimates that between 20 and 100 km²/year of coastal land will be lost.¹⁰ Similar impacts can be expected for Kenya and Tanzania.

The expected increases in rainfall and extreme events (including those related to El Niño and La Niña) will lead to changes in water flows and sediment loads of river basins that flow into the WIO, which in turn will lead to increased floods and to direct impact on ecosystems such as mangroves and seagrass beds.

3.7 Institutional context

3.7.1 National policy and legal frameworks – Key issues

The system of government varies in the different national jurisdictions. However, and notwithstanding the decentralisation processes that are ongoing, the government systems of Kenya, Mozambique and Tanzania can all still be characterised as centralised. The key legal and policy characteristics for all three countries concern the existence of environmental provisions in the constitution, the existence of a framework environmental act, including environmental assessment provisions, and at least a policy promoting the notion of integrated coastal area management. A detailed overview of relevant policies and legislation for

¹⁰ The study also looked at the impact if sea level rise is considerably higher as predicted by (Rahmstorf, 2007). A sea level rise of 1.2 meter by 2100 would lead to a land loss of up to 160 km² / year.

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each of the countries can be found in the detailed analysis undertaken as preparation for the *Resilient Coasts (WIO)* design (WIOMSA et al, 2013).

Of direct relevance for *Resilient Coasts (WIO)* is the fact that all three countries have made progress in promoting more integrated approaches to coastal zone management (ICZM). This process started in 1993 when Ministers of Environment from the WIO region met to deliberate on the strategy for implementation of Chapter 17 of Agenda 21 of the UN Conference on Environment and Development-UNCED (GEF, 2012). The implementation of ICZM calls for the establishment of Inter-Ministerial Committees to oversee the integration of actions to achieve sustainable use of marine and coastal resources, and such committees have now been established in all three countries. Importantly, the Nairobi Convention has given new impetus to this process of promoting ICZM through the development of the ICZM protocol to the Nairobi Convention. Kenya has now developed an ICZM policy, while Tanzania and Zanzibar have both developed coastal management strategies.

Also of direct relevance for *Resilient Coasts (WIO)* is the fact that all three countries have made efforts to address climate change related issues at a national level. Recent assessments of climate change adaptation activities at a national level highlight differences in levels of preparedness to address this overarching environmental challenge. Priority sectors have most often been agriculture, water resources, and health, as well as in the case of the mainland countries, energy. Although most country strategies and plans also include fisheries, coastal zones, or coastal and marine ecosystems, there have to date been relatively few adaptation initiatives focused on these sectors.

Based on feedback received during stakeholder consultations, it can be cautiously concluded that the overall policy and legal framework in Eastern Africa provides a good enabling environment for sustainable management of coastal and marine management, although there are still gaps to be addressed e.g. on aspects such as co-management arrangements and specific policies for ecosystems like seagrass beds. A special case is Kenya where all policies and legislation need to be reviewed to ensure they are aligned with the new constitution.

In spite of the positive overall assessment, actual implementation of policies and legislation is generally weak, as confirmed by all stakeholders consulted. A number of factors contribute to this and these are summarised below.

Lack of awareness – This applies in particular at local government levels and to local communities. National policies and legislation are often not well communicated to these levels, leading to situations whereby neither the local government staff nor the communities are sufficiently aware of their roles, their rights and their responsibilities related to the coastal and marine management. It is often only in areas where specific projects are being implemented that awareness raising is undertaken in a structured manner.

Enabling without regulating – While the policy and legal framework provides a good enabling environment, actual regulation is still weak. Enforcement and compliance is primarily a role of local level stakeholders, yet local governments and local branches of national ministries are generally understaffed and underfunded, which makes effective law enforcement a difficult task. Where co-management arrangements exist, the same problem of lack of resources (e.g. boats) also applies to community organisations with regulating responsibilities in coastal / marine management. In addition to this the sustainable financing and organisational capacity of such local co-management arrangements remains a challenge.

Administrative overlaps and changes in mandate – Management of coastal and marine ecosystems in Eastern Africa is not the responsibility of one Ministry, but of several Ministries with overlapping mandates. As a result, there are many pieces of legislation involving many ministries and Authorities that are relevant to the marine and coastal environment. This myriad of legislation has led to difficulties in coordination and synergy resulting in duplication of efforts poor awareness across different sectors and Ministries, and sometimes gaps in implementation. A good example is mangroves, which may see overlapping mandates and policies from Ministries of Forestry, Ministries of Fisheries, Ministries of Environment and also the Ministries in charge of Protected Areas if the mangrove forest has a protected status. A further complication is that Ministry mandates are regularly changed, especially after elections. An example is Mozambique where the Ministry of Fisheries was for a while incorporated into the Ministry of Agriculture, thereby reducing the political weight of the fisheries sector which affected progress in improving fisheries management.

Coordination issues – This is directly related to the above, since mandate overlaps requires good coordination between the various government institutions. Two issues in particular are important in this respect. First of all, the difficulty that environmental ministries face in trying to coordinate environmental aspects across sectors. Sector ministries tend to focus on implementing their sector plans, with cross-cutting issues such as environmental concerns taking backstage. Secondly, the inadequate understanding of the link between river systems and coastal/marine systems is reflected in a disconnect between coastal management coordination mechanisms and river basin management coordination mechanisms. For example, the ICZM coordination structures referred to earlier do not yet adequately incorporate important stakeholders in river basin management such as the river basin authorities or the private sector. A specific challenge on coordination is faced by Tanzania, where marine and coastal management are not Union issues but are dealt with separately by Tanzania mainland and Zanzibar, in spite of them occurring in the same geographical setting. For example, each has developed its own coastal management strategy, without necessarily ensuring harmonisation with the other.

Limited recognition of role of ecosystem services - While the need to build ecosystems resilience is recognised in national policies, this recognition is still mostly limited to the objective of biodiversity conservation. The important role that ecosystems play for human livelihoods through provision of goods and services is not explicitly analysed. This leads to an underrating of the economic value of ecosystems, and hence their importance is not receiving the attention due, especially at the national level where macro-economic planning and related budget processes are taking place.

3.7.2 Regional policies and legal frameworks

There are a number of regional multi-lateral agreements and bodies that relate to coastal and marine management, such as the Convention on the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention) with its Secretariat at UNEP in Nairobi, Kenya; the South Western Indian Ocean Fisheries Commission (SWIOFC) with its Commission based in Harare, Zimbabwe and the UNESCO-IOC Sub Commission for Africa and the Adjacent Island States (IOC-AFRICA), based in Nairobi.

Within the context of *Resilient Coasts (WIO)*, the Nairobi Convention (NC) is the most important of these, as it provides the main framework for regional cooperation in the protection, management and development of the WIO region's marine and coastal environment, for sustainable socio-economic growth and

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prosperity. The Secretariat of the NC is hosted by UNEP. At the national level, the Convention has focal points in each of the WIO countries, hosted in Mozambique by the Ministry of the Coordination of the Environment, in Kenya at the National Environmental Management Agency and in Tanzania by Ministry of Environment in the Vice President's Office.

Of particular relevance is the endorsement by the NC member states of the Strategic Action Programme for the Protection of the Marine and Coastal Environment in the Western Indian Ocean from Land-based Sources and Activities (SAP), which is a key reference document for the design of *Resilient Coasts (WIO)* (Section 5.3).

Equally of importance is the development, under the NC, of a regional protocol on Integrated Coastal Zone Management (ICZM). A draft protocol has been developed and is expected to be negotiated and adopted in the biennial period 2013-2014. The purpose of this Protocol is to provide a framework for regional and national integrated coastal zone management for sustainable development within the geographical coverage of the WIO region. The protocol provides for inter and intra-sectoral institutional coordination mechanisms to enable implementation of national ICZM frameworks. It is recommended that Contracting Parties establish national ICZM Committees (or strengthen existing structures to carry out the required functions) as well as establishing modalities to ensure their sustainability. Additionally, the proposed ICZM protocol will provide for the establishment of a regional ICZM network composed of representatives of national ICZM committees in order to enhance regional dialogue, information exchange, coordination and collaboration. Other expert groups already established under the Nairobi Convention include the Consortium for the Conservation of Marine and Coastal Regional Coral reef task force, Mangrove Network for the WIO region and the Seagrass Taskforce for the WIO region.

3.7.3 Regional and national stakeholders – Many initiatives of relevance for *Resilient Coasts (WIO)*

In order to be effective in enhancing resilience, *Resilient Coasts (WIO)* needs to engage across multiple sectors and stakeholders – including but going beyond the more traditional institutions engaged in natural resource management of marine resources (e.g. Environment, Fisheries and Forestry) and reaching out to, for example, sectors responsible for and/or engaging in climate change, economic and rural development as well as those focusing on upstream issues (such as Agriculture and Water). The Programme needs to be able to create inclusive platforms that allow for exchange between the private sector, non-governmental as well as governmental organizations across multiple levels (site, national and regional). Furthermore, it needs to ensure an effective mix of organizations that can add value across the knowledge-practice and policy nexus.

A detailed institutional analysis was carried out during the course of the preparatory phase which was used to inform stakeholder consultations as well as develop a preliminary stakeholder map (included as Annex 2).

4 Programme justification

4.1 Core problem – High vulnerability of ecosystems and livelihoods

Vulnerability of ecosystems and livelihoods can be seen as a function of exposure and sensitivity to threats, the potential impact and the adaptive capacity (Figure 5).

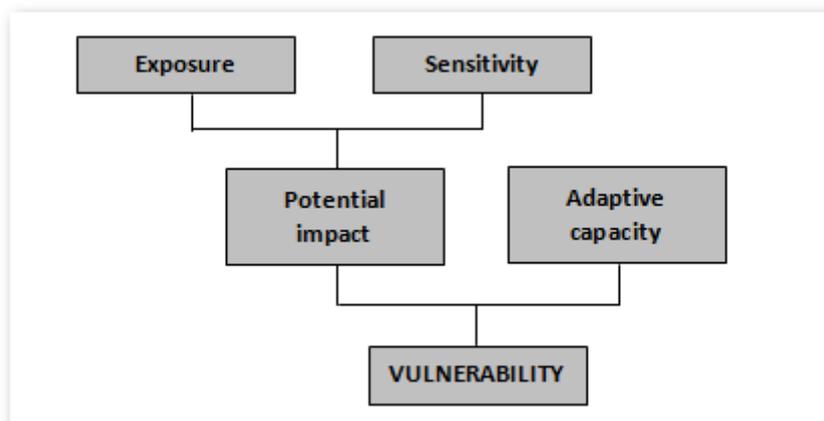


Figure 5 - Conceptual model vulnerability (IPCC, 2007)¹¹

A thorough assessment of vulnerability requires a complex analysis of all these factors, for which the available information is largely insufficient. Nevertheless, some analysis on vulnerabilities of coastal livelihoods and ecosystems has been undertaken in background studies for *Resilient Coasts (WIO)* and is summarised below.

The root causes of vulnerability of coastal HHs to natural hazards include poverty, natural resource dependency and strong dependence on vulnerable livelihoods activities (e.g. fishing, agriculture), weaknesses in local governance, degraded resources, and insecure or inequitably distributed property rights.

Coastal communities in Eastern Africa are highly vulnerable to floods as a result of location of settlement and crop cultivations within and adjacent to the flood plains; erosion and destruction of trees in the catchment areas; lack of awareness of the flood hazard by the local communities; reduced capacity of the soil to absorb water; weak buildings that can't withstand flood water and high risk infrastructure. Coastal communities and ecosystems in Eastern Africa are also particularly vulnerable to climate change, due to sea surface temperature increase and sea level rises. Climate change is also expected to increase the frequency of storms, the occurrences of floods as well as droughts, directly affecting agricultural and fisheries production. Although the regions was spared the tsunami impact that Asia saw (and that sparked the interest in starting MFF-Asia), future tsunamis cannot be ruled out, and many of the coastal villages and cities are vulnerable to such an event.

The high dependency of coastal communities on the services and goods provided by the coastal and marine ecosystems makes them particularly vulnerable to any negative impacts on those ecosystems. The main threat to these ecosystems might in fact well be the increased pressure on these resources from those very

¹¹ Exposure: The nature and degree to which a system or individual experiences environmental or socio-political stress Sensitivity: The extent to which a human or natural system can absorb the impacts without suffering long-term harm or some significant state change. Adaptive capacity the preconditions necessary to enable adaptation to take place, where adaptation is a process or activity undertaken in order to alleviate the adverse impacts of environmental stresses or take advantages of new opportunities

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communities, caused by population growth, limited alternative livelihood opportunities and the demise of traditional mechanisms for sustainable management (which have so far not been replaced by effective new governance and management structures). This leads to a downward spiral with ecosystems less able to provide services and goods, forcing the population to further increase the pressure on these systems. Fisheries is the key example here, with catch rates declining in all coastal regions of Eastern Africa.

The ecosystems are also negatively impacted by more external factors. Climate change will directly impact their health. Corals in particular are threatened by sea surface temperature rise caused by global warming which bleaches corals and eventually kills them if higher water temperatures persist. Mangroves will be affected by both sea level rise and increased storm surges¹². Changing temperatures and more perturbation of coastal waters from storm surges will negatively impact on existing seagrass beds. Growth of seagrass may also be negatively affected by changes in atmospheric CO₂ levels and in the pH-levels of oceanic waters. Low-lying coastal forests will be impacted by sea level rise, both through direct flooding and through increased salinity levels of ground water.

River basins in the three countries are increasingly dammed, leading to changes in water flows and nutrient discharges that affect mangroves and seagrass beds in particular, which in turn has negative consequences on associated fisheries. The problem is further exacerbated by the lack of sustainable management practices in the river watersheds, leading to deforestation, land degradation and pollution from agriculture, affecting both the nutrient load and water quality of the river discharges.

Urban and ports development, coastal mining and the rapidly developing oil and gas industry in southern Tanzania and northern Mozambique impact on mangroves through clearing for housing and for large infrastructure development along the coast.^{13 14} Seagrass will be impacted by pollution from the mining and the gas/oil industries, and its low visibility (compared to coral reefs and mangroves) as an important ecosystem makes it all the more vulnerable.

Coastal forests will also be impacted by infrastructure development for the gas and oil industry as well as urban and port development. Of particular concern is the clearing of coastal forests for commercial farming (such as plantations for sugar cane, palm trees, bio-fuel crops), continued clearing for small scale agriculture (often “slash and burn” due to poor coastal soils) and for tourism development.

The vulnerability of coastal socio-ecological systems to such developments is for a large part also determined by the legal framework and governance systems that are in place. While a strong legal framework that defines the rights of communities and the important role of ecosystems for local livelihoods is important, it is ultimately the quality of the governance processes that determine whether such frameworks are effectively applied and thereby help to reduce the vulnerability of coastal communities and ecosystems. Such processes do not only need to be transparent and allow equitable participation of all stakeholders, they also need to be well informed for it to lead to sound decision-making.

Table 5 summarises the main threats and their potential impact on coastal and marine ecosystems and coastal livelihoods.

¹² A detailed study of CC impact on mangrove in Tanzania (5) found that mangroves were increasingly affected by erosion caused by strong wave action.

¹³ Near the small village of Palma, in Mozambique, 6000 ha will be cleared for liquid gas facilities, with approximately 60% of this area currently covered by mangrove.

¹⁴ IUCN is currently actively involved in trying to mitigate negative impacts through the Fair Coasts project

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Table 5 - Summary of threats and potential impacts

Threat	Main ecosystems impact	Main livelihoods impact
Over-exploitation of coastal and marine resources	All ecosystems affected and less able to provide goods and services	Less production from ecosystems: fish, mangrove timber, shells from seagrass beds, etc. Increased conflicts over access to reduced resources
Climate change	Coral reef bleaching; erosion of mangrove stands; seagrass growing conditions negatively affected	Directly vulnerable to storm waves / floods. Long term impact on fisheries. Problems in agriculture through increased salinity levels.
Deforestation / land degradation / dam construction in river catchments	Shifts in water flows, nutrient load and water quality (pollution) affect mangrove and seagrass.	More floods, threatening crops and houses. Reduced flows from dam construction can restrict water use for domestic / irrigation. Positive: more nutrients may increase soil fertility.
Conversion of forests / wetlands into commercial farming	Destruction of coastal forests, which are habitat for many species. Loss of regulatory / buffer functions of forests and wetlands	Loss of source for timber and non-woody products. Loss of agricultural land. Positive impact: employment creation.
Large economic development developments (ports, urban expansion, gas/oil)	Destruction of mangrove, coastal forests. Damage to seagrass beds.	Displacements. Loss of access to mangroves, fishing grounds. Environmental risks such as groundwater pollution, oil spills on the ocean, etc. Employment creation could be positive impact, but required qualifications will largely exclude coastal communities. Further positive impacts possible from corporate social / environmental responsibility programmes.

4.2 Enhancing resilience – the main focus of *Resilient Coasts (WIO)*

The Mangroves for the Future Programme in the Western Indian Ocean, *Resilient Coasts (WIO)*, is centred around enhancing the resilience of coastal socio-ecological systems (understood to be inter-related ecological and livelihood systems) to reduce the core problem of their vulnerability to natural hazards and to developments that impact on them such as specific macro-economic trends, coastal and offshore urban and industrial developments and developments upstream and in river basins that affect coastal and marine systems.

Resilient Coasts (WIO) utilises the definition of resilience defined by the Intergovernmental Panel on Climate Change (IPCC, 2008) as: “*The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change*”.

Building resilience into socio-ecological systems in today’s complex and unpredictable world requires effective responses to threats and shocks at multiple scales and by multiple actors. To adapt to changing circumstances communities are required to, for example, have higher levels of flexibility and be willing and able to change occupations or locations; be better able to plan, learn and re-organise, and have access to resources they require to do so. Institutional frameworks need to be supportive of community efforts to adapt – from local authorities to national financial planning processes. Engaging with this complexity

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requires adaptive management approaches and strengthening the resilience of socio-economic, ecological and institutional systems to stresses and shocks.

IUCN's experiences across a number of programmatic initiatives suggest that resilience is built by integrating four components¹⁵, termed the "resilience framework":

1. **Ecological and Social Diversity** – of the relationships between nature, the economy, livelihoods
2. **Innovative and sustainable infrastructure and technology** – using approaches that integrate ecosystem services and combine appropriate design and operation of engineered infrastructure and the 'natural infrastructure' of ecosystems
3. **Equitable and resilient governance systems** – through inclusive governance and empowerment in adaptive institutions
4. **Data and information for adaptive management** – from better information and capacity building for individuals and institutions

Diversity plays a central role in resilience – whether it is biodiversity within a coral reef or diversity within the livelihood or economic strategies of a social structure. Eastern Africa is characterised by a rich variety of tropical coastal habitats - mangrove forests, seagrasses and coral reefs. The existence and interaction of these habitats with the broader landscape - river basin estuaries and catchments and coastal forests inland and offshore ocean currents provide a concentration of high biodiversity and productivity, including high levels of endemism. While these systems have been shown to have high intrinsic levels of resilience in some locations (as exemplified by the recovery rates and resilience to coral bleaching from ocean warming in the northern Mozambique Channel), their resilience and hence diversity is increasingly threatened by indirect shocks such as damming of rivers and by unsustainable use linked to population growth and limited diversity of livelihood options (e.g. fishing and agriculture).

Innovative and Sustainable infrastructure and technology - Alongside engineered solutions, natural infrastructure plays a critical role with regards to reducing levels of exposure to natural disasters and maintaining or enhancing resilience. Engineered and natural solutions need to be combined (such as the use of wetlands, floodplains and mangroves for storing water and sediments, lowering flood peaks or buffering coastal communities from the impacts of flooding) to reduce levels of vulnerability to external shocks. Unfortunately, the focus in infrastructure development in Eastern Africa is currently almost entirely on engineered solutions – mining, building ports, transport corridors, building pipelines for oil and gas, and building future coastal mega-cities with little consideration being given to the potential environmental, social and demographic impacts.

Equitable and resilient governance systems – The capacity for self-organisation is a key element of social resilience of communities, with this strength often emanating more from informal networks and relationships than economic wealth or even formal institutions. Within Eastern Africa, the traditional systems of self-organisation related to sustainable resource use are no longer respected and social cohesion and social structures are under pressure from migration. On-going decentralisation processes provide opportunities for new forms of self-organisation and local governance mechanisms, but are as yet

¹⁵ Adapted from: Smith, M. (2011) Development and Application of a Resilience Framework to Climate Change Adaptation, SEARCH Project – Briefing Paper, Global Water Programme, IUCN, Switzerland

far from being fully effective. (*Note: A more detailed overview of governance related issues, particularly at national and regional levels is provided for in Section 3.7).

Data and information for adaptive management - The challenge of resilience lies not in being able to prepare for anticipated dangers but rather the timely detection of and ability to quickly adapt in the face of unanticipated threats. To do so, our understanding of connections and relationships needs to be improved (e.g. the relation between river basins and critical coastal habitats; the roles of seagrasses and mangroves as nursery grounds; the danger of removing key species from a system) and better ways need to be found to recognise when a system is approaching a critical threshold – where even a small disturbance occurring at the right place and time can completely destroy an entire system. Learning in the context of resilience also requires investing in the “soft processes” that allow for exchange and interaction between different stakeholder groups as well as different sectors.

The above described elements of resilience have been used as the reference framework and starting point for the design of the *Resilient Coasts (WIO)* programme as described in Section 4.

5 Programme design principles

5.1 Ridge to Reef

As highlighted in Section 1, important functional relationships exist between river basins and coastal areas. The two systems are linked through both natural processes (water flows and sediment) and human activities (urban development, rural activities, infrastructure, waste and pollution). It has become increasingly evident that the human activities carried out in further inland areas bear significant impacts on the health of coastal ecosystems. Habitats such as mangroves and seagrass beds are directly impacted by changes in river flows, sediment loads and water quality. With 6 major rivers flowing into the WIO in Eastern Africa, and with much of these river basins being the subjects of developments such as deforestation for agriculture and damming for hydropower, there is a clear need for a more holistic approach to management of coastal systems. The Ridge to Reef approach (Figure 6) attempts to make the relation between river systems and coastal systems more explicit, by understanding the impacts of processes in river basins on coastal systems, by promoting ridge to reef planning processes at a landscape scale and by strengthening the institutional linkages between “ridge stakeholders” (river basin authorities, government agencies in charge of agriculture and hydropower development, inland communities, private sector companies using fresh water in their production process, etc.) and coastal stakeholders.



Figure 6: Ridge to Reef

5.2 Knowledge – Practice – Policy nexus

Resilient Coasts (WIO) engages with all three aspects of the Knowledge – Practice – Policy nexus.

It will support creating new knowledge, models and approaches to resilience building for sustainable coastal development. Knowledge will be generated on technical and economical aspects, but also on institutional aspects, i.e. analysing the broader frameworks that influence coastal investment decisions. The focus will be on generating knowledge that will strengthen the case for sustainable management of coastal resources and for nature-based solutions to resilience building.

The programme will use the knowledge generated to promote innovative actions (practice) on the ground to manage coastal ecosystems sustainably and enhance the resilience of vulnerable coastal communities and ecosystems. Through such actions, and by promoting an action-learning approach, new knowledge will be generated and additional information gaps will be identified, which will in turn inform the programme's support to knowledge activities.

The results of the knowledge and practice activities will be used to promote scaling up of best practices and to influence policy frameworks and governance processes at multiple levels: from the local level (e.g. influencing district planning processes) and the national level (e.g. promoting the integration of nature-based resilience building in NAPs, PRSPs, ICZM and strengthening EIA processes) to the regional level (e.g. policy dialogue/policy support at the national and regional levels to facilitate the implementation of the ICZM protocol), and policy support for climate change strategies. All levels involve multiple actors and sectors – civil society, government and the private sector.

Through the Knowledge-Practice-Policy nexus the programme will tackle both the direct and the underlying causes of ecosystem degradation, unsustainable livelihoods and persistent vulnerability in coastal areas.

5.3 Using lessons learnt and building on existing initiatives

Resilient Coasts (WIO) is unique in that it provides a broad programme framework for regional and national cooperation on coastal resilience building in the WIO region. There are however many (past, ongoing and planned) global, regional and national initiatives on coastal systems management that can provide valuable lessons for design, and that provide a basis for the Programme to build on.

These can be grouped into two main categories:

1. Those related to programme governance, management and implementation; and
2. Those related to resilience building and sustainable management of coastal systems

Resilient Coasts (WIO) will draw strongly on the experience of the MFF-Asia programme in the design of its governance, management and implementation arrangements. The programme will also build on existing regional initiatives for its governance and management, in particular the institutional structures for regional and national coordination on coastal management as set up under the Nairobi Convention, and related institutional initiatives such as the WIO-C (a consortium of NGOs in partnership with inter-governmental organisations).

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Resilient Coasts (WIO) will contribute to the NC endorsed Strategic Action Programme (SAP) for the Protection of the Coastal and Marine Environment of the Western Indian Ocean from Land-based Sources and Activities (WIO-SAP). This programme has four main objectives:

1. Critical coastal habitats in the WIO region protected, restored and managed for sustainable use
2. Water quality in the WIO region meets international standards by year 2035
3. River flows in the WIO region are wisely and sustainably managed by the year 2035
4. By 2015, stakeholders will collaborate effectively at the regional level in addressing transboundary challenges

In Section 6.3 more details are given on how the *Resilient Coasts (WIO)* contributes to these four objectives of the SAP.

While there have been many programmes and projects on coastal and marine management in the WIO region in general and in Eastern Africa in particular, there is limited information providing a consolidated overview of lessons learnt from these initiatives with regard to their effectiveness and their impact on coastal socio-ecological systems. One of the first activities under the *Resilient Coasts (WIO)* will therefore be to collate and analyse lessons learnt and emerging best practices on coastal management from all past and ongoing initiatives¹⁶. This will help ensure that the Programme is able to focus its support on initiatives with the highest added value in terms of knowledge generation, piloting new approaches and scaling up best practices and not repeating past mistakes.

5.4 Significance of multi-stakeholder & sectoral collaboration to resilience building

Resilience building requires integrating the four components of diversity, sustainable infrastructure & technology, governance and the use of data & information for adaptive action. It is through such an integrated approach that adaptive capacities of socio-ecological coastal systems can be meaningfully enhanced. This requires institutional frameworks at different scales and different levels in which state and non-state stakeholders from different sectors effectively coordinate and collaborate.

For example: Coastal zone managers need to work with climate change specialists to promote restoring and protecting natural coastal ecosystems, such as mangroves and coral reefs, that can both provide cost effective natural buffers and reduce human impacts as well as continue to provide vital provisioning services such as fisheries. Private sector companies and government agencies in charge of mining and tourism need to collaborate with communities to ensure that large-scale coastal economic development does not negatively impact on the local livelihoods and the ecosystems on which they depend. Ridge stakeholders such as river basin authorities and agricultural agencies have to coordinate with Reef stakeholders to mitigate negative impacts of river basin development on coastal systems. National governments of the countries in Eastern Africa have to collaborate on management of coastal systems with transboundary characteristics such as shared river basins and on large marine ecosystems that are vital for all coastal systems.

Resilient Coasts (WIO) will promote multi-sectoral and multi-stakeholder approaches from the local to the regional level through different strategies. It will directly support existing cross-sectoral institutional arrangements on coastal management, or support creation of such structures where they don't exist, the latter in particular at landscape level. It will encourage linkages with academic institutions and support

¹⁶ Reports from regional projects such as ASCLME and WIO-LAB will be important sources of lessons learnt.

research that will promote integrated approaches to coastal management. When supporting action on the ground, the Programme will encourage collaboration and partnerships between governments, PS, NGOs, academia and community stakeholders by including such partnerships in selection criteria for activities to be supported.

6 Programme design

6.1 Vision, mission and goal

The vision of *Resilient Coasts (WIO)* is “Healthy coastal ecosystems for a more prosperous and secure future for coastal communities”. It is the same vision as originally formulated for MFF-Asia.

The mission of *Resilient Coasts (WIO)* is “to use a partnership-based approach that builds knowledge, supports action on the ground and enhances governance and policy processes in support of building resilience of coastal systems against external shocks and hazards, including climate change”. This mission statement emphasises the elements of *partnerships* (between governments, civil society, private sector and academia) and of the *Knowledge-Practice-Policy* nexus, with the policy aspect encompassing governance processes at all levels (from local to regional).

The goal for *Resilient Coasts (WIO)* is “to strengthen the resilience of coastal socio-ecological systems in the Western Indian Ocean region”. As such, the programme will address all 4 aspects of the resilience framework described in previous sections.

6.2 Focus areas, results and Programmes of Work

Using conceptual modelling based on the resilience framework described in section 4.2, four main focus areas (components) have been identified, with the following objectives

Focus area 1 - Strengthen adaptive capacities of local communities dependent on coastal and marine resources;

Focus area 2 - Enhance resilience of critical coastal ecosystems and habitats

Focus area 3 - Influence coastal economic development to be more environmentally sustainable and socially equitable.

Focus area 4 - Support the effectiveness of good governance mechanisms as an enabling framework for enhancing coastal resilience

For each of these focus areas, the programme will support activities, or Programmes of Work, structured on the basis of results for each aspect of the Knowledge-Practice-Policy nexus. This is illustrated in Figure 7 (next page), which shows the expected knowledge, practice and policy (governance) results for each of the focus areas.

For each result area, up to 6 Programmes of Work have been identified. These PoWs are detailed in Annex 3. All initiatives under the *Resilient Coasts (WIO)* will contribute to at least one of these PoWs but in most cases to more than one. Key indicators for the programme have been identified at the level of focus areas and result areas, and are also listed in the results-based logical framework in Annex 3.

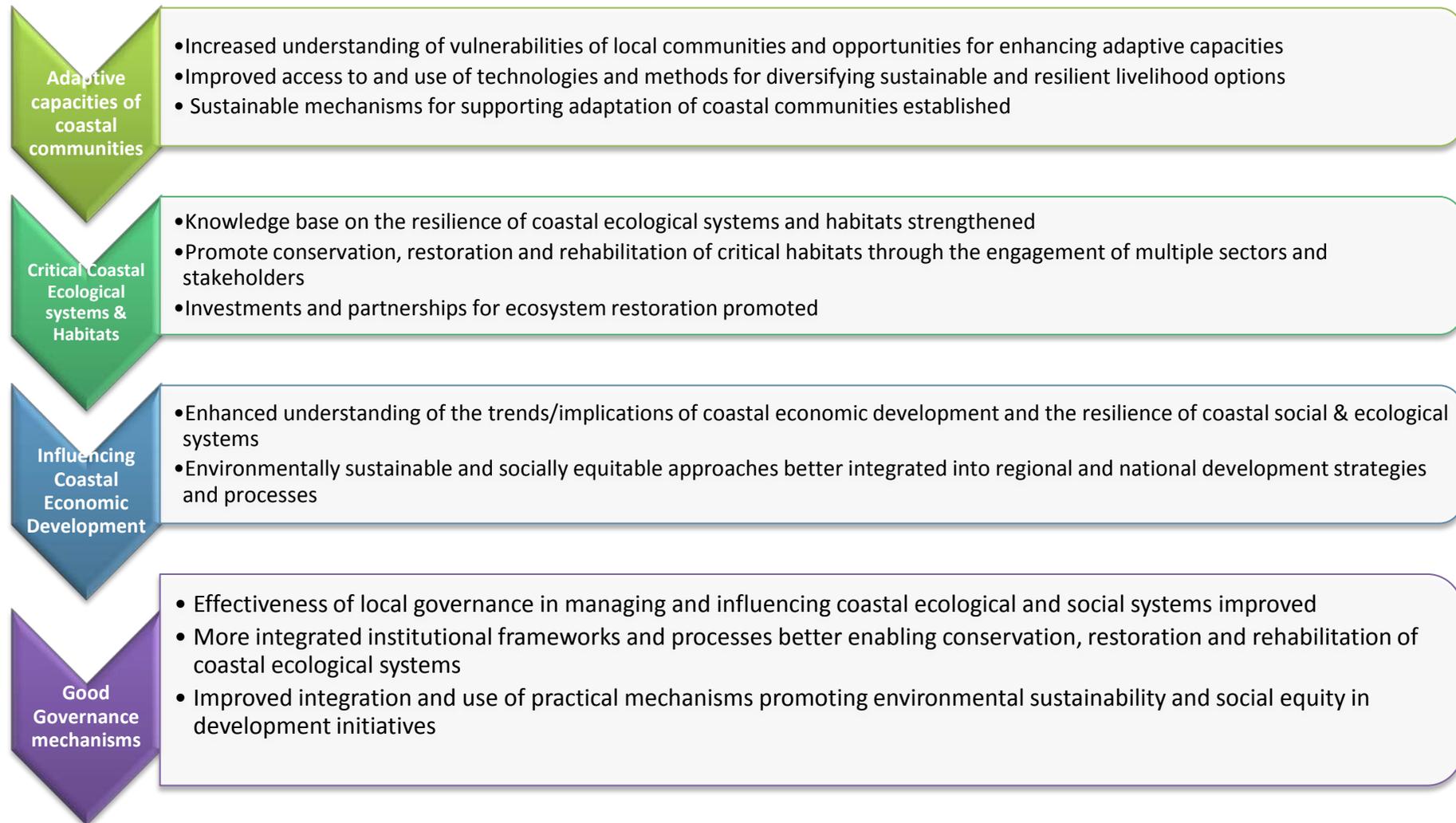


Figure 7 Programme Framework - An Overview (Refer to Annexes 3 and 4 for details)

6.3 Alignment with the Strategic Action Programme

Table 6 shows how the result areas of *Resilient Coasts (WIO)* contribute to the Strategic Action Programme for the protection of the coastal and marine environment of the Western Indian Ocean from Land-based Sources and Activities.

Table 6 - Alignment of Resilient Coasts (WIO) with SAP

Objectives of Strategic Action Programme Focus areas / results of <i>Resilient Coasts (WIO)</i>	Strategic Action Plan Objectives			
	A. Protecting, Restoring and Managing Critical Coastal Habitats	B. Managing water quality	C. Managing river flows wisely	D. Strengthening governance & awareness
Focus area 1. Strengthen adaptive capacities of local communities dependent on coastal and marine resources				
Result 1.1 Increased understanding of vulnerabilities of local communities and opportunities for enhancing adaptive capacities	X		X	
Result 1.2 Improved access to and use of technologies and methods for diversifying sustainable and resilient livelihood options	X			
Result 1.3 Effectiveness of local governance in managing and influencing coastal ecological and social systems improved				X
Result 1.4 Sustainable mechanisms for supporting adaptation of coastal communities established				
Focus area 2. Enhance resilience of critical coastal ecological systems and habitats				
Result 2.1 Knowledge base on the resilience of coastal ecological systems and habitats strengthened	X		X	X
Result 2.2 Enhanced involvement of multiple stakeholders in the conservation, restoration and rehabilitation of critical habitats	X		X	X
Result 2.3 More integrated institutional frameworks and processes better enabling conservation, restoration and rehabilitation of coastal ecological systems.	X	X	X	X
Result 2.4 Investments and partnerships for ecosystem restoration promoted				
Focus area 3. Influence coastal economic development to be more environmentally sustainable and socially equitable				
Result 3.1 Relationship between coastal economic development and the resilience of coastal systems better understood				X
Result 3.2 Improved integration and use of practical mechanisms promoting environmental sustainability and social equity in development initiatives	X			
Result 3.3 Environmentally sustainable and socially equitable approaches better integrated into regional and national				X

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development strategies and processes				
Focus Area 4: Governance and knowledge management				
Result 4.1 Strengthened governance structures and knowledge management systems				
Result 4.3 Support to the development and implementation of the ICZM protocol provided				
Result 4.3 Effectiveness of governance at all levels in managing and influencing coastal ecological and social systems improved				
Result 4.4 Multisectoral processes to enhance coordination and collaboration between environment and non-environment sectors established and/or strengthened e.g. ICZM committees, networks				

7 Implementation approach

7.1 Programme phases

Resilient Coasts (WIO) will initially be implemented over a period of 5 years (from 2014 through to 2018). The programme will start with an inception phase of maximum 1 year, a full implementation phase of 3 years, and a consolidation phase of 1 year.

The inception phase will be used to set up all programme governance structures, design programme management tools and methods and develop strategic partnerships. This phase will also be used as a “listening” phase, in particular at the national level, to ensure that national priorities are well understood and guide national programme implementation. This will be done through:

- i. Expert driven spatially explicit analysis to map vulnerability, ecosystem functions, health and adaptability to prioritize land and seascapes for practical action; and
- ii. Highly participatory planning processes that further define and prioritize land/seascapes; targets; and actions relevant both at the national as well as regional levels.

During the implementation phase, the focus of the programme will be on supporting pilot activities in the knowledge, practice and policy realms, with the focus gradually shifting from generating knowledge to applying knowledge through action on the ground and then towards using the knowledge and lessons learnt for influencing policies and governance processes. During this phase, the programme will also initiate discussions with other countries in the WIO region to assess the possibilities for a gradual expansion of the programme’s geographical scope.

In the consolidation phase the programme’s main attention will shift towards knowledge management and promoting scaling up of best practices nationally and regionally. During this phase, the programme will also consolidate strategies aimed at expanding the programme, with the ultimate goal of institutionalizing the Programme in the WIO region as a long term framework for regional cooperation on resilience building of coastal systems.

7.2 Geographical scope

The programme will initially be implemented in Eastern Africa, encompassing the coastal systems of Kenya, Tanzania and Mozambique. As mentioned above, discussions with other WIO countries will be initiated during the implementation phase and this may lead to the inclusion of more countries into the Programme. The ultimate goal is for *Resilient Coasts (WIO)* to become a truly regional programme that covers all countries of the WIO region.

Priority Ridge to Reef landscapes/ seascapes will be identified where the programme will support field-level activities. The selection of these landscapes/seascapes will be done during the inception phase, and will be based on a number of criteria (Box 1) that will be applied across all countries.

Within each priority landscape / seascape, the programme will identify ongoing initiatives (projects, planning processes, economic activities, infrastructure development, etc.) to which it can add value to by supporting such initiatives in piloting the incorporation of resilience building aspects into their work. Where needed, the programme will also support small new initiatives that can provide “proof of concept” of innovative models or approaches for resilience building of coastal systems, using where possible an action-learning approach that sees researchers and practitioners jointly implement such initiatives.

1. Ecological

- a) Ridge to Reef (Land-sea connectivity) and regional (ocean) connectivity
- b) Significance of ecosystem functions in terms of ecosystem services and resilience of the system
- c) Existence of critical habitats (in particular mangroves)
- d) Outstanding Universal Value

2. Social

- a) Vulnerability
- b) Levels of adaptability and resilience
- c) Levels of capacity and awareness

3. Economic

- a) Developments (ongoing, planned)

4. Governance

- a) Existing of structures (at different levels) which the programme can engage with, with scope for ensuring clarity of roles and responsibilities and added values of participating bodies.

5. Relevance

- a) Alignment with national priorities
- b) Significance of the area to resilience at a wider geographical level (national & regional)

6. Operational

- a) Ongoing initiatives of relevance
- b) Engagement of more than 2 sectors & more than 2 types of stakeholders

Box 1 - Criteria for selection of priority landscapes / seascapes

7.3 Partnerships

7.3.1 Main implementing partners

IUCN

IUCN, the International Union for the Conservation of Nature, was established in 1948 and brings together 83 States, 110 government agencies, over 800 non-governmental organizations (NGOs), and some 10,000 scientists and experts from 181 countries in a unique worldwide partnership. Its 1,100 staff are located in 40 countries thus it is a multicultural, multilingual organization with the world's largest and most important conservation network. Its mission is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable. Its headquarters and secretariat is in Switzerland and its undisputed strength is the scientific basis of its activities.

IUCN has been working in Eastern and Southern Africa for several decades and officially opened its offices in the region in the 1980s, pioneering a number of conservation initiatives. To improve its efficiency, in 2008 IUCN merged the two regional offices of Eastern and Southern Africa and established the Eastern and Southern Africa Regional Office (IUCN ESARO) in Nairobi, Kenya. Today, IUCN ESARO has 7 offices across the region: Kenya, Mozambique, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. The IUCN ESARO Programme is operationalized through six thematic areas¹⁷, each of which is led by a thematic technical expert and a technical team of Programme Officers (at both regional and country levels). There are 13 IUCN members across Kenya, Mozambique and Tanzania with Kenya as a State Member and Government Agencies as members in both Mozambique and Tanzania. 9 of these members are drawn from Non-Governmental Agencies, 3 of which are International Organizations.

IUCN ESARO has a long history of engaging in marine and coastal issues across the region and has contributed to several important interventions in the WIO region. Currently, IUCN ESARO is implementing the Fair Coasts Initiative which is “enhancing the capacity of key stakeholders in the north-eastern Mozambican coast (government ministries and agencies, oil and gas companies, eco-tourism sector, coastal communities, fisher folk, etc) to maximize the opportunities presented by the discovery of natural gas to achieve fair and sustainable results in respect of economic development, biodiversity conservation and community development and to minimize or mitigate economic, social, political, business and biodiversity risks inherent in gas and infrastructure development in one of the world's most biogeographically, geologically and oceanographically unique coasts

IUCN has an active Global Marine and Polar Programme (IUCN GMPP) that focuses on the use of science and technology for the sustainable management and conservation of marine ecosystems and resources. This includes the provision of scientific information on the impact of climate change on the marine environment and policy recommendations on Ecosystem-based Adaptation (EbA) to international processes such as the United Nation Framework Convention on Climate Change (UNFCCC). IUCN also has an Environmental Law Centre (ELC) based in Germany that is part of the rich network of environmental law expertise that comprises the IUCN Environmental Law Programme (ELP). The ELP is an integrated programme that is geared towards assisting decision makers with information, legal analysis, advisory services, legislative drafting, mentoring and capacity building at national, regional and global levels. The Programme also provides the opportunity and the forum for governments, non-government organisations

¹⁷ These include: Conservation Areas and Species Diversity; Business and Biodiversity; Drylands; Forests & Climate Change; and Marine & Coastal; and Water and Wetlands

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and others to network and to share information and discuss ideas. The ELP is delivered through both the ELC as well as the IUCN Commission on Environmental Law (CEL) – a global volunteer network of over 500 environmental law specialists in more than 130 countries.

Nairobi Convention

The Nairobi Convention for the protection, management and development of the marine and coastal environment of the Western Indian Ocean region is the Regional Seas Convention for Eastern and Southern Africa including the Island states in the Western Indian Ocean (WIO). The Contracting Parties to the Convention include Comoros, France, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, Tanzania and the Republic of South Africa. The convention was developed by UNEP as part of the implementation of the 1972 Stockholm Agenda and as a response to transboundary problems in the WIO such as marine pollution and the need for regional management of the marine and coastal environment.

The Nairobi Convention framework includes 1) the Eastern Africa Action plan for cooperation on environmental assessment and management adopted in 1985; and 2) A legally binding convention embodying the general commitment adopted in 1985 and ratified by the ten Contracting Parties as well as three detailed protocols on: a) Combating marine pollution in cases of Emergency adopted in 1985; b) Protected Areas and Wild Fauna and Flora adopted in 1985; and c) Land Based Sources and Activities adopted in 2010. A fourth protocol dealing with integrated coastal zone management has been drafted for negotiation and adoption in the coming biennium.

The Nairobi Convention offers a legal framework for regional cooperation through which the Contracting Parties in the Western Indian Ocean region addresses critical national and transboundary issues in response to the numerous threats to the marine and coastal environment. The Convention provides a valuable framework to share regional expertise and experiences to protect, manage and develop the coastal and marine resources as well as to create opportunities for sustained socio-economic growth and industrial prosperity.

The Convention and its protocols are implemented through detailed Work Programme on themes identified and prioritised by Contracting Parties during Conferences of Parties. The Conference of Parties is the premier decision-making organ for the Convention- a biennial meeting that convenes Ministers of Environment and technical experts from all countries that are parties to the convention and regional and international organisations. For instance in decision CP 5/2 of the Fifth Conference of Parties (COP5), Contracting Parties inter alia endorsed and supported the use of the eco-system based management approach, including the involvement of up-stream countries, for the conservation of the coastal and marine environment of the WIO region. In decision CP7/13 Contracting Parties also endorsed the Mangroves for the Future Partnership and agreed to engage in dialogue to develop this initiative further in the Western Indian Ocean region. As a consequence, these prioritised themes comprise substantive programme activities for the current biennium.

The Convention's Work Programme is implemented through a coordination structure that constitutes the Programme Coordination Office in Nairobi which provides strategic direction; a Bureau of Contracting Parties that provides guidance in the implementation of the Convention; a network of national focal points; thematic experts groups such as Coral Reef Taskforce, and Legal and Technical Working Group; the Forum for Heads of Academic and Research Institutes (FARI); the Consortium for the Conservation of Marine Resources in the Western Indian Ocean (WIO-C); and the Regional Coordination Unit based in the Seychelles which is responsible for implementing activities that enhance the political visibility of the

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Convention. The Work Programme is also implemented through dialogue and strategic partnerships with national, regional and international NGOs, UN organisations and Regional Economic Commissions.

WIOMSA

The Western Indian Ocean Marine Science Association (WIOMSA) was established in 1993 as a regional professional, non-profit, membership organisation. WIOMSA is dedicated to promoting the educational, scientific and technological development of all aspects of marine sciences throughout the region of Western Indian Ocean (Somalia, Kenya, Tanzania, Mozambique, South Africa, Comoros, Madagascar, Seychelles, Mauritius, and Reunion (France)), with a view toward sustaining the use and conservation of its marine resources. WIOMSA has a particular interest in linking the knowledge that emerges from research to the management and governance issues that affect marine and coastal ecosystems in the region.

WIOMSA has over the years provided a wide range of services to a broad spectrum of national, regional and international organisations. The services provided have included project and programme planning and delivery, organization of events, technical and professional capacity development, administration of grants funds, review of technical documents, and a broad range of consultancy on behalf of different clients. WIOMSA has several unique characteristics that make it attractive as a vehicle to work in partnership with other leading regional organisations on programmes such as this MFF-WIO initiative:

- Recognition as an important partner by governments, regional and international organizations, development partners, NGOs and regional programmes/projects due to its extensive knowledge and understanding of regional issues, priorities and processes;
- Regional and international recognition as a source of reliable and accessible knowledge on the WIO region;
- Established working relationships with key individuals as well as a number of institutions within and outside the WIO region. The Association has Memoranda of Understanding with UNEP as the Secretariat of the Nairobi Convention, the Wildlife Conservation Society, and the Coastal Resource Center of the University of Rhode Island;
- A multi-disciplinary membership representing a pool of expertise that could be called upon to be involved in the implementation of activities;
- Proven experience in designing and implementing activities in collaboration with national, regional and international partners.

CORDIO

Coastal Oceans Research and Development – Indian Ocean (CORDIO) specialises in generating knowledge to find solutions to the problems facing coastal people and marine environments in the Western Indian Ocean (WIO). CORDIO is a regional research-based not-for-profit organisation focused on marine and coastal ecosystems in the Western Indian Ocean. CORDIO was initiated as a programme in the Indian Ocean in 1999 as a direct response to the El-Niño caused mass bleaching and mortality of corals in 1998. CORDIO East Africa was registered in Kenya in 2003 as a company, limited by guarantee, under the laws of Kenya and has an office in Mombasa and Nairobi. The geographic scope of CORDIO East Africa's office is the WIO: Comoros, Kenya, Madagascar, Mauritius, Mozambique, Somalia, Seychelles, Tanzania. CORDIO also works in the Gulf of Aden and Red Sea.

CORDIO East Africa's research and conservation work addresses problems that are linked in the Western Indian Ocean: growing population and consumption; limited resources and habitat; high dependency; low education and wealth; poor governance. CORDIO emphasises linked solutions to these problems: ecological

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and social resilience; adaptive capacity; environmental conservation; sustainable use; education, policy and governance; investment in livelihoods and improved capacity. CORDIO implements work across three sectors to search for solutions and to enable their implementation: Research and Knowledge; Management and Policy; Capacity Building.

To address these objectives CORDIO works to define processes, biodiversity and resource use in marine ecosystems in the WIO, and to assess ecological and socio-economic impacts of human activities including fishing and climate change. CORDIO has a strong focus on indicators and long term monitoring and assessment to monitor trends in key coastal environmental indicators. Research results and long term trends are published in CORDIO's WIO Status Reports, which also extend to the northern Indian Ocean, including Maldives, Sri Lanka, India and Indonesia.

CORDIO East Africa also works in environmental education and awareness through its Education Programme which focuses on school teachers, children and adult education, including literacy. CORDIO also has extensive experience in technical training in field based surveys on coral reefs, fishery monitoring and field identification of corals and fishes. CORDIO works in partnerships to achieve its objectives but also to build scientific capacity within the WIO region, particularly through supporting post-graduate students and through a student intern programme.

CORDIO East Africa also facilitates, in partnership, the development of alternative or supplementary livelihoods for coastal communities to reduce fishing effort on wild stocks. The livelihood programme is strongly focused on building capacity to manage marine resources through adult learning which includes the use of interactive telecommunication tools suitable for rural coastal communities.

With a twelve year history of grant and project management CORDIO East Africa can demonstrate effectiveness and delivery with a broad range of partners and donors.

7.3.2 Strategic regional partnerships

During the initial stages of *Resilient Coasts (WIO)*, possible partners (organisations or broad programmes) who could become involved in the Programme at a strategic (regional) level will be identified, following the successful model of strategic partnerships used by MFF-Asia. Provisional criteria for such partnerships include:

- Active programmatic engagement in the region and options for synergies between *Resilient Coasts (WIO)* and their current initiatives;
- Interest in becoming involved in *Resilient Coasts (WIO)*;
- The expertise they can bring to the programme, in particular expertise that complements the expertise of the initial implementing partners (e.g rural development, sustainable agriculture, Integrated Water Resources Management, watershed management);
- The national, regional and global networks that they are part of and that can be mobilised to strengthen *Resilient Coasts (WIO)* knowledge management as well as the Programme's institutional width and depth;
- Their potential in contributing to long term sustainability of *Resilient Coasts (WIO)*, both institutionally and financially.

Experiences from Asia have shown that MFF's strengths and uniqueness lie in the nature of the partnerships established between public and private sectors, multi-lateral agencies and civil-society (including academia). *Resilient Coasts (WIO)* will similarly strive for diversity in establishing strategic partnerships, learning from both the successes and the challenges of MFF-Asia.

7.3.3 National and local level partnerships

At the national level, partnerships will primarily be developed and established through existing national structures, as far as possible (such as the ICZM Committees). Experience from MFF-Asia has shown that extra efforts are required to ensure that effective mechanisms are built to reflect the multi-sectoral nature of the programme, with government, Private Sector, civil society and the research community all represented in a balanced way. Furthermore, a Ridge to Reef approach requires good representation of Ridge stakeholders such as river basin authorities and ministries in charge of agriculture and rural development. Through national coordination structures, the programme will promote joint initiatives across sectors. Acknowledging that transaction costs of partnerships are generally high, the programme will support partnership-based approaches at this level, integrating targeted capacity building activities as relevant and appropriate to each situation.

At the local level, the programme will support partnerships between local governments, communities and the private sector by giving preference to joint initiatives in assessing proposals for action on the ground. Action-research, with researchers collaborating with local stakeholders, will also be given priority over stand-alone research activities. Collaboration between local level “ridge” stakeholders and “reef” stakeholders will be particularly encouraged.

7.4 Programme governance and management

7.4.1 Regional Levels

A Regional Steering Committee will be formed that will act as the highest level oversight body for *Resilient Coasts (WIO)*. The ToR and exact composition of the RSC will be determined during the inception phase of the programme, but it will be based on the successful model of MFF-Asia, whereby the RSC is not primarily a management committee, but rather an oversight structure (with an important decision-making role in programmatic steering) and a regional knowledge sharing platform.

The RSC will reflect the multi-sector, multi-stakeholder approach of *Resilient Coasts (WIO)* in its composition, and may include the following:

1. Implementation partners;
2. Regional / national government stakeholders;
 - a) National focal points of the Nairobi Convention, who will also be representing national coordination structures of the *Resilient Coasts (WIO)*, ensuring that the programme is relevant to national priorities
 - b) Selected key government ministries and agencies involved in agriculture, climate change, coastal management, rural development and river basin management.
3. Private Sector organisations representing important sectors such as gas/oil industry, mining, tourism, energy.
4. National NGOs, ideally representing national umbrella organisations or forums related to coastal management.
5. International development NGOs with a regional reach; ideally ongoing relevant programmes in each country of Eastern Africa.
6. Academic and/or other research institutions involved in research related to coastal systems
7. International development partners, including *Resilient Coasts (WIO)* donors (as observers).

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The total membership of the RSC will be pegged at a number to be agreed upon at inception to allow for meaningful discussions at plenary level and to ensure that the costs for these meetings remain within reasonable limits.

The RSC will meet once per year with an agenda that is balanced between the strategic focus and oversight functions of the RSC and activities giving opportunity for knowledge-sharing and networking between countries and partners. Timing of the meeting will as much as possible be harmonised with regional meetings under the Nairobi Convention. This will not only be cost-efficient, but will also strengthen the linkages with the Convention, and the possibility to bring emerging issues and evidence-based lessons learnt from *Resilient Coasts (WIO)* directly into the NC agenda.

7.4.2 National & Landscape/Seascape levels

The National Coordinating Committee will be responsible for the coordination of *Resilient Coasts (WIO)* at the national level. This will be guided by National Coastal Resilience Strategic Action Plans (NCRSAPs) which will be elaborated during the inception phase. As with the RSC, the NCCs will also function as national platforms for information sharing and exchange. The NCC will have important decision-making powers relating to the implementation of *Resilient Coasts (WIO)* in their country, in particular with the identification of priority activities and targets outlined in the NCRSAPs. The composition of the NCCs largely mirrors that of the RSC at national level.

The NCCs is expected to have at least 2 regular meetings per year. The agenda for the meetings will include analysis and approval process for proposed activities to be funded under the *Resilient Coasts (WIO)* as well as analysis of progress of ongoing activities with a focus on successes, challenges and lessons learnt that are of relevance for both *Resilient Coasts (WIO)* and a wider audience. Full ToRs for the NCC's will be developed during the inception phase.

Each of the three countries currently have existing coordinating structure for coastal zone management albeit with different levels of functionality. During stakeholder consultations for *Resilient Coasts (WIO)* it was widely suggested that the programme can build on these structures for the creation of the NCC, since they already provide a cross-sectoral platform for coordination of coastal management initiatives and also act as national taskforces for the Nairobi Convention. During the inception phase, the programme will engage with these coordinating structures in the countries to assess the possibility to expand their mandate to become the multi-stakeholder national coordination structure of the *Resilient Coasts (WIO)* and to analyse what changes in their composition and mandates would be required for them to be able to play that role effectively.

Where the NCC will be able to build on the existing coordinating structure, the NCC meetings will as much as possible be synchronised with planned meetings of the existing coordination structure for reasons similar to those explained for the RSC. If required, the NCC, or a delegated sub-committee, can meet on ad-hoc basis to discuss issues that require urgent decision-making.

It should be noted that the role of the RSC and NCC vis-à-vis existing regional and national coordination structures on coastal management should not be seen as trying to supplant those structures. Rather, the RSC and NCC will be able to enrich the discussions and improve the quality of decision-making processes of those regional and national coordination structures by providing a knowledge platform on evidence-based lessons learnt and best practices related to building resilience of coastal systems.

7.4.3 Regional and national management support structures

Regional, national and landscape level coordination structures will be supported in their tasks by a Project Facilitation Unit (PFU).

The Regional PFU will be responsible for the day-to-day management and coordination of *Resilient Coasts (WIO)*, acting as a liaison between landscape, national and regional levels. It will have wide-ranging tasks that include preparing annual plans and budgets (in close collaboration with landscape & national coordination structures), develop tools, methods and guidelines for communications, grant making and MLE, coordinate approaches for cross-cutting issues such as capacity building and gender mainstreaming, coordinate all monitoring and progress reporting activities, organise regional meetings / workshops / exchange visits, develop regional-level projects and develop and coordinate the *Resilient Coasts (WIO)* knowledge management strategy (including maintaining a web portal). Provisionally it is foreseen that the regional PFU will need to be staffed by:

- A regional coordinator
- Project activity facilitations officer(s)
- A financial and administrative manager
- A monitoring & KM officer

The main tasks of the national PFUs include:

- Supporting the coordination committees in developing and regularly reviewing strategic and operational action plans
- Administrative and financial management of all *Resilient Coasts (WIO)* funded activities
- Preparing annual plans and budgets
- Supporting the committees in developing and implementing country-specific versions of communication and KM strategies, operational guidelines etc.
- Organising committee meetings, information sharing events, thematic workshops
- Supporting the committees in implementing the MLE framework

Detailed ToRs for the PFUs will be developed during the inception phase and submitted to the regional committee for approval.

7.5 Project facilities

Resilient Coasts (WIO) will deliver national and local level projects through several mechanisms – including grant facilities, modelled after MFF-Asia experience and lessons learnt with grant making. Such projects (research, direct action, capacity building, etc.) represent the main approach taken by the Programme to achieve real impact on the ground in terms of piloting innovative approaches for coastal ecosystem restoration/rehabilitation and sustainable livelihoods for coastal resource-dependent communities. The projects also help to empower communities to play a stronger role in coastal resources governance processes.

Two types of grants for national and local initiatives will be made available under the programme: small grants and medium grants (with pre-defined budget ceilings). An important pre-condition for the latter type of grants is that they will only be awarded for proposals in which at least 2 of the 4 main stakeholder categories (government, civil society, private sector, research institutions) collaborate. Stakeholders will be invited to submit proposals through competitive calls for proposals. Only projects that contribute to the priority PoWs identified in the country's action plans will be considered for funding. Field-level projects will

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be limited to the priority landscapes / seascapes identified in action plans, with preference given to proposals that build on existing initiatives.

Detailed guidelines for the small and medium grants will be developed during the inception phase. The overall guidelines will be the same for all countries, but each country will have country-specific elements such as the geographical focus areas and the key PoWs to which the projects are to contribute.

Apart from grant making, the programme will also work with its strategic partners on identifying and developing initiatives that go beyond national borders, i.e. initiatives related to transboundary coastal systems shared by two countries, or initiatives which have relevance for the whole Eastern Africa region (and possibly the whole WIO region). Such projects will be coordinated by *Resilient Coasts (WIO)* strategic partners, and will have to be approved by the regional committee.

7.6 Risks, Assumptions and Mitigation Measures

A complex regional programme like *Resilient Coasts (WIO)* will inevitably have a fairly high number of risk factors that may affect its effective implementation. Given the high number of stakeholders to be involved in the programme, the highest risks relate to ensuring active participation of all stakeholder categories (government, civil society, private sector, research institutions) at all levels of programme governance and implementation. This includes for example the risk of low attendance at committee meetings due to the full agendas of their members, and the risk of low involvement of Private Sector partners in these governance structures, a risk which was already evident during stakeholder consultations in preparation of the *Resilient Coasts (WIO)* programme.

Another major risk area is the challenge of translating the complexity of resilience building into practical initiatives in the Knowledge-Practice-Policy nexus without losing the link with the overall framework. If this link would be lost, *Resilient Coasts (WIO)* could end up supporting a large number of “business as usual” isolated coastal management project, instead of being at the forefront of strengthening all inter-related components of coastal resilience building at a regional level.

A major overall mitigating factor for risks in *Resilient Coasts (WIO)* is the fact that the programme can build on lessons learnt from MFF-Asia. Lessons that have informed *Resilient Coasts (WIO)* design include for example the need for sufficient staff at national and regional PFU level, the importance of an inception phase during which in-country analyses are carried out to inform the action plans and the need to develop capacity building and gender mainstreaming strategies (see next sections).

An overview of risks and related assumptions and mitigation measures can be found in Annex 5.

7.7 Cross-cutting issues

7.7.1 Capacity building

Building capacity of local, national and regional stakeholders will be promoted by *Resilient Coasts (WIO)* at all levels and in all activities. Capacity development is defined as the process through which individuals, organisations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time (MFF-Asia). *Resilient Coasts (WIO)* will mainstream capacity building aspects in all pillars of the knowledge – practice – policy nexus, as depicted in Figure 9.

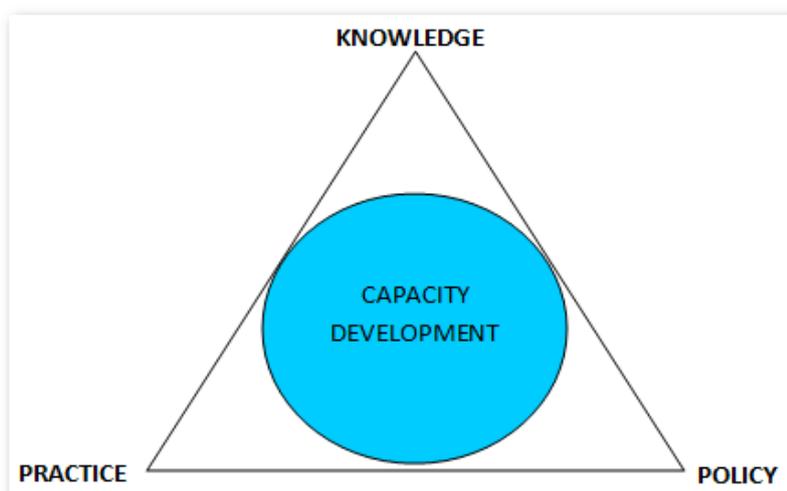


Figure 8 Integrating capacity building in the knowledge-practice-policy nexus

Within the context of *Resilient Coasts (WIO)*, capacity development focuses on understanding the value, functioning and inter-relationships of coastal socio-ecological systems (and related river basins), on managing these systems to strengthen their resilience, and on equitable and integrated governance, policy and planning processes in support of resilience building. Applying the concept of Integrated Coastal Zone Management (ICZM) will be a key element in capacity development efforts.

Capacity development will further address organisational development aspects i.e. building the capacity of organisations and institutional structures involved in coastal management (including the Programme's own structures like the regional, national and landscape level committees) to constantly improve their capacity to effectively carry out the mandate entrusted to them by society in an accountability and transparent manner. At community level, the capacity of CBOs and other community structures to effectively engage in governance processes around coastal systems will receive particular focus. Grant recipients will also be trained in project development & management and in financial management.

A capacity development strategy will be developed during the inception phase of the programme. This will start with a capacity needs assessment in each of the three countries, as part of the preparation of the national action plans, making sure similar recent assessments are consulted to avoid duplication. This will ensure that capacity development will be fully mainstreamed in the NSAPs and other relevant national strategies and plans.

Mainstreaming capacity development in all projects will further be promoted by stipulating that all proposals for small and medium size grants need to incorporate a capacity needs assessment of the stakeholders involved in the project. These will be used by the programme to identify and organise capacity building activities that benefit stakeholders across multiple *Resilient Coasts (WIO)*-supported initiatives.

The programme will set aside a specific budget for a wide range of capacity development activities such as:

- Supporting formal training institutions in developing training courses related to resilience building of coastal systems;
- Developing field level resilience training modules and manuals for use by *Resilient Coasts (WIO)* grant recipients;
- Training trajectories for *Resilient Coasts (WIO)* grant recipients (researchers and practitioners) in which they share experiences

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- Linking researchers with practitioners on understanding resilience aspects of coastal socio-ecological systems, at field level, national level and regional level.
- Supporting action learning approaches at community level and local government level
- Linking researchers and communities to strengthen the link between traditional and scientific knowledge;
- Linking the Private Sector with communities to develop community business related issues
- Scholarships
- Study tours / learning events
- Master classes

The capacity development activities will continuously be evaluated and updated with new insights and best practices emanating from the research and action on the ground supported by *Resilient Coasts (WIO)*, as they are identified through the MLE framework. Capacity building activities will oftentimes be combined with learning events, such as an annual national review workshops.

7.7.2 Gender

For a programme like *Resilient Coasts (WIO)* which focuses on resilience building of socio-ecological coastal systems, the importance of gender mainstreaming cannot be overstated. Coastal households, in particular the poorer quintiles, are highly dependent on the ecosystems for their livelihoods, but men and women make different uses of the ecosystem goods and services and have therefore different perceptions on the management of these systems. While this is relatively well researched within the fisheries sector (see Box 3), gender aspects and perspectives related to use and management of other ecosystems such as mangroves and coastal forests, and the ridge- reef link, are less well understood. There is also a lack of knowledge on how climate change and other hazards that affect these ecosystems will impact differently on the vulnerability of men and women. How important it is to understand this better was made very clear by the tsunami of 2004, which resulted in a much higher death toll amongst women and children than amongst men, because many men were fishing at sea when the tsunami struck. Less obvious vulnerability differences include for example access to fresh water (generally the responsibility of women).

In small-scale fisheries, men and women have distinctly different roles. Men tend to fish offshore or in major inland water bodies, while women fish close to shore and are often forced to use unsustainable methods like use of mosquito nets to be able to catch anything. Women also tend to be more involved than men in post-harvest activities, such as fish processing and marketing. In terms of management of fisheries resources, women are generally under-represented in local decision making bodies such as Beach Management Units. This means that management and resilience building efforts will tend to focus on fish species that are important for men i.e. those that are caught on the open seas, while largely ignoring the fish species, shells, crabs and other sea products collected by women along the shoreline.

Box 2 – Gender differences in small-scale fisheries

A gender analysis will be undertaken during the inception phase to address the gaps in knowledge on gender aspects, in particular by analysing the gender specific issues for each of the 4 elements of the resilience framework. The results will be used to develop a gender strategy that ensures effective and equitable involvement of both men and women in building resilience through the PoWs. The strategy will learn from MFF-Asia's experience in gender mainstreaming, but will also draw from lessons learnt from coastal management programmes in Eastern Africa, such as the Tanga Coastal Zone Conservation and Development Programme (Box 4) which was supported by IUCN from 1994 to 2005.

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Box 3 – Lessons learnt on gender mainstreaming in coastal programmes, from the Tanga Coastal Zone Conservation and Development Programme (T.van Ingen et. Al, 2002)

- The need to use techniques that stimulate the participation of women, such as participatory techniques.
- The need to provide adequate training and awareness raising on gender, involving all stakeholders, and providing periodic ‘refresher’ training
- The value of creating “role-models” for women and encouraging leadership and responsibility in promoting gender equity
- The need to ensure equitable participation in all activities
- The importance of a good gender monitoring programme, that is well understood, simple to use, and that is maintained.

The gender strategy is expected to provide a mix of approaches and methods for mainstreaming such as:

- Using the results of the gender analysis to elaborate country-specific gender strategies as part of the national and landscape level action plans;
- Including gender aspects in guidelines for presentations, articles, documentaries, website, but also in internal reports etc.;
- Development of gender manuals / guidelines / toolkits for use by Programme structures and in Programme projects, combined with capacity building;
- Ensuring that a minimum percentage of income generating activities benefits women;
- Approaches to promote gender balance in the Programme’s governance and management structures;
- Recruiting gender expertise where needed;
- Ensuring that government ministries with responsibilities for gender affairs are member of the Programme Committees;
- Setting aside a % of grant funds for research and action projects that research / address specific gender issues;
- Carrying out regular gender audits (e.g. as part of annual reviews or external evaluations).

Institutionally, *Resilient Coasts (WIO)* will follow the approach adopted by MFF-Asia, with the Programme Facilitation Unit having the overall responsibility for coordinating gender aspects, monitored by the regional committee. At the national level, each national committee will appoint a gender focal point who, with support from the project facilitation unit, will be responsible for ensuring that the gender mainstreaming strategy is effectively applied at country level.

7.8 Monitoring, Learning and Evaluation

The aim of the MLE framework is:

- To have an ongoing and systematic collection of information for demonstrating changes from known baselines as the result of Programme initiatives;
- To capture lessons learned, especially from *Resilient Coasts (WIO)* projects on the ground;
- To enable Programme stakeholders to meet and learn from each other; and
- To identify knowledge gaps and training/learning needs which *Resilient Coasts (WIO)* can address via other forms of support.

At project level, monitoring will be guided by a limited set of key process, results and outcome indicators that should be included in the project proposal, and progress will be as much as possible assessed against baseline data. With *Resilient Coasts (WIO)* prioritising building on existing initiatives over starting new

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projects, it is expected that a minimum set of baseline data will in most cases be available. Projects will be required to report explicitly on lessons learnt as they relate to relevant PoWs. In annual review and planning workshops at the national and regional level, such lessons learnt will be shared amongst stakeholders. This will culminate in annual assessment at national and regional level of progress made and lessons learnt on issues such as:

- Effectiveness of new approaches and concepts for resilience building of coastal systems: what works, what doesn't, what are the main challenges, which aspects require further research / piloting, what are key capacity gaps, which elements have good potential for scaling up and how can this be achieved, which policy issues need to be addressed to strengthen the enabling environment for such new approaches, which opportunities exist for regional learning based on successes of the different countries in addressing specific PoWs.
- Programme management and implementation issues: efficiency in the use of resources, effectiveness of grant making facilities, adequacy of project proposal evaluation process, effective involvement of all stakeholder categories, balance of supported initiatives in terms of addressing all critical PoWs, financial management issues, success in mainstreaming gender aspects.

The assessment will inform the annual review of the action plans and the planning and budgeting of *Resilient Coasts (WIO)* activities for the next year.

At field level, the programme will promote the use of an action learning approach, which apart from the learning element is also an effective capacity building method. National stakeholders, and in particular members of the national committees, will be encouraged to participate in MLE field visits. Exposure to field level sites provides a good learning opportunity and will allow them to become more adaptive to the dynamic and changing context of their work and to be more effective advocates for required institutional and policy changes at national level. Learning amongst stakeholders within each priority landscape will also be promoted, e.g. by organising field days in the landscape in which all Programme supported initiatives can present and discuss their successes and challenges in building resilience of coastal systems.

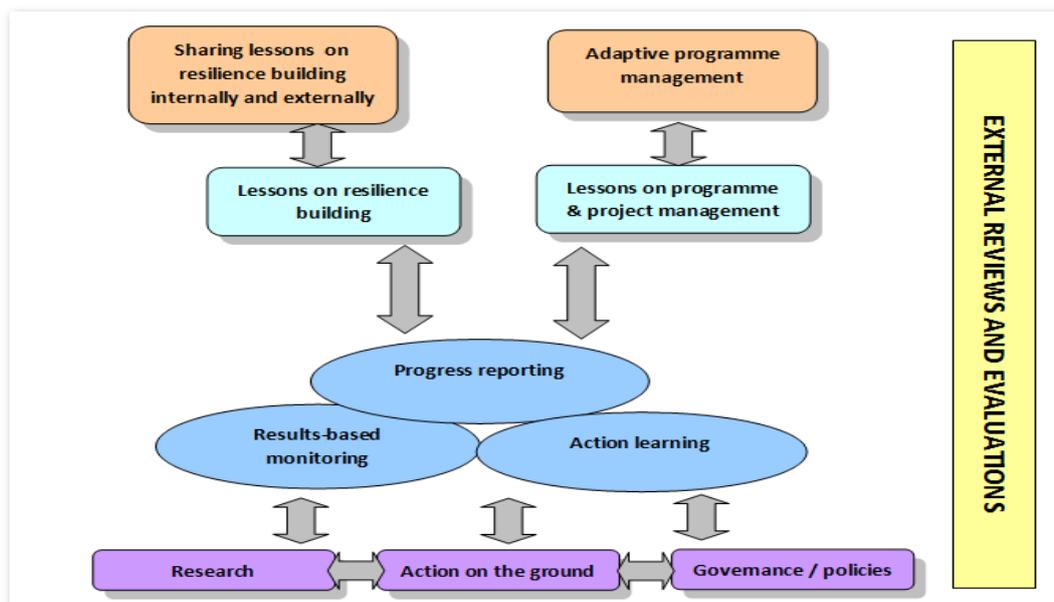
At the regional level, learning will further be facilitated through various approaches such as exchange visits, establishing regional communities of practice (using a mix of approaches such as regional thematic workshops and webinars) and, possibly, longer term "secondment" of stakeholder representatives from one country to a successful *Resilient Coasts (WIO)* supported initiative in another country to gain in-depth insight in the key factors behind such success so that these can be replicated in the home-country.

All recipients of *Resilient Coasts (WIO)* grants will be required to submit regular progress reports, but the programme will refrain from imposing a standardised report format. Instead a list of guidelines with minimum information requirements will be developed, to allow grant recipients to include this information in their standard reporting formats. The focus for *Resilient Coasts (WIO)* will not be on describing activities implemented, but rather on demonstrating the added value of the grants received and on identifying lessons learnt and information gaps.

Mid-year reviews and end of phase evaluations will also be carried out, commissioned and managed by the regional committee.

The different elements and information flows of the MLE framework are illustrated in Figure 10

Figure 9 – Schematic overview of the MLE framework



7.9 Communication & Knowledge Management

7.9.1 Communication

A communication strategy is an important tool for a programme as broad and wide ranging as *Resilient Coasts (WIO)*. A detailed communication strategy will be designed during the inception phase to support efficient programme delivery, maintain good working relations with stakeholders, ensure the scaling up of lessons from demonstration projects and to serve as a knowledge base and promotional platform to influence management and policy, support new partnerships and attract donor funding. The strategy will address, inter alia, the following communication aspects:

1. *Resilient Coasts (WIO)* branding guidelines (use of logos, letterheads etc.; production / distribution of branding material like caps, T-shirts)
2. Internal reporting formats
3. Guidelines for use and distribution (use of the CC: field) of emails
4. Guidelines for the production and distribution of (digital) newsletters, brochures, and other “popular” content for a wider audience;
5. Guidelines for the use of the results of research funded by *Resilient Coasts (WIO)* in research papers and scientific publications;
6. The design and maintenance of an *Resilient Coasts (WIO)* website, including guidelines for the production of articles, for uploading of material, organisation of webinars, etc.
7. Specific communication projects for external audiences such as production of films, placing videos on Youtube, airing documentaries on national TV, poster presentations at international conferences.

The communication strategy will in particular outline the roles and responsibilities of all *Resilient Coasts (WIO)* stakeholders in all the above internal and external communication activities. Following the example of MFF-Asia, a network of national Programme communication focal points will be established whose main role will be to ensure that the communication strategy is effectively implemented in each of the countries.

7.9.2 Knowledge management

Resilient Coasts (WIO) key strength lies in linking knowledge, practice and policy work through a multi-stakeholder approach involving government, civil society and private sector at regional, national and local level. The knowledge management approach of the programme will reflect these design principles by establishing national and regional knowledge platforms that serve as hubs for the consolidation, exchange and dissemination of the knowledge generated through the programme.

National Committees will be in charge of coordinating knowledge management efforts at the national level. The main focus at this level will be to (i) ensure that all grant recipients capture and document relevant information on project outcomes and on lessons learnt and (ii) to consolidate and repackage the knowledge generated through the various national and local *Resilient Coasts (WIO)* initiatives and using these to organise knowledge events around specific issues of importance. Knowledge products and events can have different forms such as:

- Master classes in which research results are presented and explained to policy makers and/or coastal managers;
- Production of targeted policy briefs to be submitted to the highest level of government;
- Production and dissemination of guidelines and toolkits related to resilience building of coastal systems, based on *Resilient Coasts (WIO)* supported research and action on the ground;
- Presentation of lessons learnt in existing forums / knowledge platforms / roundtable meetings (including those primarily targeting and engaging the private sector);
- Contributions to National Environmental Outlook reports
- Involvement in poverty reduction strategy elaboration and monitoring processes through production / presentation of briefs that showcase the value of ecosystems for poor coastal HHs.
- Active engagement of managers and policy makers

The national committees will also be responsible for the information flow to / from the regional level, synthesising national lessons learnt into regionally relevant knowledge products, and bringing regional experiences back to the national level through “domestication” of best practices from other countries and promoting their uptake within their respective countries. The national committee is also expected to maintain a network of contacts that allows national and local Programme stakeholders to share their knowledge in an effective manner, e.g. by linking them with national television, newspapers, educational institutions, etc. The national committees will be supported in all these tasks by the PFU.

Apart from capturing lessons learnt, *Resilient Coasts (WIO)* grant recipients will also be encouraged to develop their own knowledge management initiatives, for example through supporting them in sharing their experiences in other networks and forums of which they are a member.

At the regional level, the core element of the knowledge hub will be the Programme website in which all knowledge products will be brought together for easy access by stakeholders and external audiences. The website will not be limited to Programme knowledge products; other stakeholders will be invited to share their knowledge products on coastal systems and resilience building, with the aim of making the website a true repository of all regional knowledge on coastal systems. E-newsletters and regularly organised webinars will help ensure that the website and its contents will be known to a wide audience and will inform resilience building efforts within and beyond the WIO region.

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The website will use a contents management system that will allow authorised users to easily upload information to the site. The website will also have a restricted access area for a selected group of *Resilient Coasts (WIO)* stakeholders will have login permission. This part of the website will mainly serve as a Management Information System, in which all results from the MLE framework will be accessible for *Resilient Coasts (WIO)* managers.

A key role at the regional level is to synthesise national learning experiences and to identify opportunities for increased regional learning and promote regional collaboration in developing knowledge products like guidelines and toolkits on resilience building. These processes will be supported with video-conferences, webinars and, occasionally, regional thematic workshops as part of developing communities of practice.

The KM activities at regional level will also target stakeholders beyond the WIO region. This will include for example actively exchanging information with MFF-Asia and other emerging *Resilient Coasts (WIO)* initiatives. Through IUCN's international network of members, programmes and experts, globally relevant best practices in resilience building will be shared widely, and feedback from these networks will in turn inform the *Resilient Coasts (WIO)* programme.