Annex VI. A summarized, prioritized, list of requirements for data collection OR analysis OR repatriation to inform the national MEDA.

PART 1 – Prioritized list of proposed activities from all themes of the MEDAs. Two high-priority activities from each theme (see PART 2) were considered.

Theme	Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (US$)
1.0 – **COUNTRY OVERVIEW** -				
2.1 – 2.4 **Description of the coast and distinctive features**, **General description of the climate**, **Marine and coastal geology and geomorphology**, **Freshwater resources and drainage, including rivers, estuaries, deltas and coastal lakes**	**8**	Geology and geomorphology of the southern coast of Tanzania	1) Acquisition of aerial photographs, maps, satellite imageries and desk study (US $ 30,000) 2) Field transport – 40 days (US S 4,000) 3) Field Allowance – 4 staff for 40 days @ US S 100 (US $16,000)	50,000
	2	Monitoring studies for shoreline changes: Causes of coastal erosion socio-economic impacts and mitigation options in 3 selected sites (Tanga, Mtwara and Zanzibar)	1) Acquisition of aerial photographs, satellite imageries and GIS synthesis of the data @ US $ 10,000 per site (US $ 30,000) 2) Seasonal monitoring of beach levels and erosion accretion cycles for two years at each site @ US $ 15,000 per site(US$ 45,000.0) 3) Gathering of relevant historical meteorological data (wind, rainfall, and other physical datasets (beach sediments, tidal currents) and socio-economic data (human activities that may influence beach sediment budgets, existing coastal mitigation being used etc) (US$ 45,000.0)	120,000
2.5 **Physical Oceanography**	**3**	Sea level measurements at Tanga, Dar es Salaam and Mafia	1) Tide gauge installation at 3 stations (USD 84,000.0) 2) Site inspections (USD1500.0) Local inputs (USD 6,000)	91,500
	4	Modelling of the dynamics of the ~~coastal waters - Invite regional~~ expert to assist local experts in	1) Air transport (USD 1,000.0) 2) Subsistence allowance for regional expert for 15 days (USD3,000.0)	8,800

		developing the model (ROMS). Outputs: currents, eddies, tides, sst, salinity, heat fluxes, etc	3) Allowance for 3 local experts for 15 days (USD 4,500.0) Transport for local experts (USD 300)	
	1	Mapping of the bathymetry of Tanzanian coastal waters (continental shelf only)	1) Bathymetry mapping – medium boat hire and fuel for 40 days (USD 8,000.0) 2) Multi-beam eco-sounder system (USD10,000.0) Field allowances – 4 staff for 40 days (USD16,000.0)	34,000
2.6 **Chemical and Biological Oceanography**	**18**	Zooplankton taxonomy and productivity	Graduate training on zooplankton (48,000)	48,000
	6	Nutrients analysis near rivers discharges and other important sites along the coast	1) Auto Analyzer (US$ 70,000) 2) Portable nutrient meters (US$ 25,000) Consumables and field allowances – 5 staff for 60 days (US$ 20,000)	115,000
2.7 **Coastal zone and continental shelf**	**13**	Conduct mangrove change detection using current satellite imagery and 2000 GIS data developed by Wang *et al.* (2000).	1) Purchasing current six (6) Landsat scenes (USD 2,400.0) 2) Field allowance for ground truthing for 4 local staff for 20 days (USD 8,000) Local inputs for mapping (USD 50,000.0)	60,400
	12	Mapping the distribution and densities of seagrass beds.	1) Purchasing high resolution satellite imagery (USD 50,000.0) 2) Medium boat hire and fuel for 60 days (USD 12,000.0) 3) Air transport (USD 2,000.0) 4) Subsistence allowance for regional expert for 60 days (USD 12,000.0) Local inputs (USD 30,000.0)	106,000
2.8 **Microfauna and meiofauna**	**19**	Ecophysiological studies of the micro- and meiofauna	1) To investigate the effects of temperature on the growth of micro and meiofauna (Tanks and their controls, temperature regulators, Aerators, respirometers, and accessories,) (160,000) 2) To investigate the effects of photoperiod on the growth of micro	220,000

			and meiofauna 3) A Graduate Training (60,000)	
	17	Use of micro- and meiofauna as bioindicators of marine environmental health	1) Field work Research constituting a Graduate training (100,000) 2) Assaorted chemicals (4,000)	104,000
2.9 **Macrofauna (state of biological knowledge)**	**5**	Assessment of population of commercial species ie, Octopus, lobster, squids, cuttlefish, and sea-cucumber	See details in Part 2 of this Annex	288,995
	10	Assess finfish stocks in the territorial waters.	Ship-based sampling from Research Vessel (12 days per month x 4 months 1. Perdiems 6 scientists @USD 100 =USD 28,800 2. Perdiems 6 for technicians @USD60 = USD 17,280 3. Consumables USD 3,500 4. Fuel supply (cars) USD 300 5. Hiring a Research Vessel USD 80,000	129,880
2.10 **Long term predicted atmospheric changes**	**15**	Modelling of long term predictions – Invite regional expert to assist local scientists in analyzing historic data	1) Air transport (USD 1,000.0) 2) Subsistence allowance for regional expert for 15 days (USD3,000.0) Allowance for 3 scientists for 14 days (USD 4,500)	8,500
	14	Retrieval of oceanographic data from historic surveys and expeditions	Allowance for 3 scientists for 14 days (USD 4,500)	4,500
3.0 **HUMAN ENVIRONMENT**	**11**	Socioeconomic status of the coastal communities and population distribution	1) Purchase GIS and other accessories (USD 8,000) 2) Transport and subsistence allowances to Field assistants (USD 8,000) 3) Local inputs (USD 15,000.0) 4) Two zone stakeholder workshop (USD 45,000)	76,000
	9	Assessment of level of pollution is Coastal areas and population dynamics in coastal regions	1) Field allowance for 8 local staff for 20 days (USD 8,000) 2) Local inputs for mapping (USD	18,000

			10,000.0)	
6.0 **PLANNING AND MANAGEMENT**	**15**	Determine land use and cover changes and identify urban sprawling and disaster prone areas	1) Downloading DEM data for Coastal Rivers Catchment areas (USD 500.0) 2) Purchasing six (6) archival and current landsat imagery (USD 2500 3) Preparation of maps and determine areas of change (USD 25000)	28,000
	7	Improve fisheries data storage, retrieving and backup system - Assessment of the existing fisheries databases and the formats of their datasets in order to harmonize and facilitate data sharing and communication.	1) Assess the status and formats existing datasets 2) Harmonize data format and standards 3) Develop database that integrates the different datasets and formats (30000) 4) Develop internet-enabled data sharing mechanism such as web portal. (20000) 5) Allowances for 2 local experts for 15 days for assessing the existing fisheries database and datasets format (USD 4,000.0). 6) Allowances for 2 local experts for 30 days for reviewing formats used by other sectors' databases (USD 8,000.0) 7) Compilation of a report on suggested system and data formats to be used by the Fisheries (USD 2,000.0).	64,000

PART 2: – Prioritized list of proposed activities for each theme of the MEDAs.

1.0 – **COUNTRY OVERVIEW**

2.1 – 2.4 **Description of the coast and distinctive features**, **General description of the climate**, **Marine and coastal geology and geomorphology**, **Freshwater resources and drainage, including rivers, estuaries, deltas and coastal lakes**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and cost	Total cost for activities (US$)
1	Monitoring studies for shoreline changes: Causes of coastal erosion socio-economic impacts and mitigation options in 3 selected sites (Tanga, Mtwara and Zanzibar)	(i) Acquisition of aerial photographs, satellite imageries and GIS synthesis of the data @ US $ 10,000 per site (US $ 30,000) (ii) Seasonal monitoring of beach levels and erosion accretion cycles for two years at each site @ US $ 15,000 per site(US$ 45,000.0) (iii) Gathering of relevant historical meteorological data (wind, rainfall, and other physical datasets (beach sediments, tidal currents) and socio-economic data (human activities that may influence beach sediment budgets, existing coastal mitigation being used etc) (US$ 45,000.0). (iv) Geomorphological study of the southern coast of Tanzania: Acquisition of aerial photographs, topographic maps for systematic mapping of beach ridges and marine terraces (US $ 30,000); Field transport for detailed ground truthing – 40 days @ US $ 100 (US $ 4,000); Field allowance for 4 staff during 40 days field campaign @US $100 (US $16,000)	170,000.0
2	Awareness campaigns to coastal developers and other coastal stakeholders on sustainable shore management	(i) Education brochures (about 10,000 brochures) on causes of shoreline changes and mitigation measures (Designing – US, 2,000, Printing – US $ 10,000) (ii) Stakeholders workshops in Tanga, Dar es Salaam, Mtwara and Zanzibar @ US $10,000	US $ 22,000
3	Coastal environmental impacts due to water abstractions and climate change in Rufiji and Pangani river basins and adaptation solutions	(i) Appraisal of current and future projected rate of water abstractions in Pangani and Rufiji River Basins. Consultative interviews with Pangani and Rufiji Water Basins Authorities (US $ 5,000).	25,000

		(ii) Analyses of rainfall data at Pangani and Rufiji River Basins (US $ 5,000). (iii) Appraisal of current and projected future river discharges (US $ 5,000). (iv) Mapping of coastal ecosystem (US $ 5,000) (v) Vulnerability assessment of coastal ecosystem due to anticipated changes in river discharges and adaptation solutions (US $ 5,000).	

2.5 **Physical Oceanography**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (USD)
1	Sea level measurements at Tanga, Dar es Salaam and Mafia	3) Tide gauge installation at 3 stations (USD 84,000.0) 4) Site inspections (USD1500.0) 5) Local inputs (USD 6,000)	91,500.0
2	Modelling of the dynamics of the coastal waters - Invite regional expert to assist local experts in developing the model (ROMS). Outputs: currents, eddies, tides, sst, salinity, heat fluxes, etc	4) Air transport (USD 1,000.0) 5) Subsistence allowance for regional expert for 15 days (USD3,000.0) 6) Fees for regional expert (USD 10,000.0) 7) Allowance for 3 local experts for 15 days (USD 4,500.0) 8) Transport for local experts (USD 300.0) 9) Workstation computer (1) and software (USD 10,000.0)	28,800.0
3	Mapping of the bathymetry of Tanzanian coastal waters (continental shelf only)	3) Bathymetry mapping – medium boat hire and fuel for 40 days (USD 120,000.0) 4) Multi-beam eco-sounder system (USD200,000.0) 5) Field allowances – 4 staff for 40 days (USD 16,000.0)	336,000.0
4	On the job training on satellite data collection, interpretation and analysis- Invite regional expert to assist local scientists (oceanographers and meteorologists)	1) Air transport (USD 1,000.0) 2) Subsistence allowance for regional expert for 15 days (USD3,000.0) 3) Fees for regional expert (USD 10,000) 4) Allowance for 3 local experts for 15 days (USD 4,500.0) 5) Transport for local experts (USD 300)	18,800
5	Wave measurements along severely eroded coastal beaches – Invite regional expert to assist local scientists	1) Field allowance for 4 local staff for 20 days (USD 8,000) 2) Local transport and boat hire (USD 1,000) 3) Air transport (USD 1,000.0) 4) Subsistence allowance for regional expert for 15 days (USD3,000.0) 5) Fees for regional expert (USD 10,000)	23,000

2.6 **Chemical and Biological Oceanography**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (USD)
1	Graduate training on zooplankton taxonomy and productivity	3) Graduate training on zooplankton (48,000)	48,000
2	Nutrients analysis near rivers discharges and other important sites along the coast	1) Auto Analyzer (US$ 70,000) 2) Portable nutrient meters (US$ 25,000) 3) Consumables and field allowances – 5 staff for 60 days (US$ 20,000)	115,000
3	Conduct investigations on spatial and temporal distribution of HAB along TZ coast	1) DGGE and PCR machines for genetic studies (US$ 60,000) 2) Allowance for 3 local experts for 30 days (USD 15,00.0)	75,000
4	Training on studying and monitoring Radioactive pollution	1) GC-MS instrument (US$ 150,000) 2) Consumables for GC-MS and AAS (US$ 15,000) 3) Training on AAS and GC-MS (US$ 5,000) 4) Training on studying and monitoring Radioactive pollution (US$ 6,000)	176,000

2.8 **Microfauna and meiofauna**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (USD)
1	Ecophysiological studies of the micro- and meiofauna	4) To investigate the effects of temperature on the growth of micro and meiofauna (Tanks and their controls, temperature regulators, Aerators, respirometers, and accessories,) (160,000) 5) To investigate the effects of photoperiod on the growth of micro and meiofauna 6) A Graduate Training (60,000)	220,000
2	Use of micro- and meiofauna as bioindicators of marine environmental health	3) Field work Research constituting a Graduate training (100,000) 4) Assaorted chemicals (4,000)	104,000
3	Effect of predation or avoidance by downward migration and/or competition for food resources on the spatial patterns of micro-and meiofauna.	1) Under what conditions does predator-induced dispersal of meiofauna occur and can we document `costs` (e.g. energetic, mortality) that meiofauna incur due to this dispersal? (60,000) 2) Does competition between meiofauna influence small-scale	120,000

		spatial distributions? If so, can we identify the limiting resources and link them their spatial distribution to meiofauna patterns? (60,000)	
4	Large scale patterns in meiobenthic diversity and community composition	1) To investigate the factors most important in discriminating the assemblages. (25,000) 2) To define the taxonomic level needed to discriminate these patterns in dataset (25,000)	50,000
5	Effects of changes in physico-chemical parameters on the micro and meiofauna	1) HORIBA (Multparameter Meter) 8,000 2) Laboratory experiments (50,000)	58,000
6	Feeding relationships in micro and meiofauna.	1) Are reductions in micro/meiofaunal abundances, due to foraging by nonselective, highly mobile predators, masked by meiofauna dispersal? (25,000) 2) Do selective, territorial or sedentary predators create small but measurable patches with low abundances of micro/meiofauna or altered taxonomic composition? (25,000)	50,000
7	Species assembly rules	1) To understand the factors enabling high diverse communities to co-exist (30,000) 2) To estimate the relative importance of biological processes versus abiotic factors and stochastic processes in structuring communities. (30,000)	60,000

2.9 **Macrofauna (state of biological knowledge)**

Priority	**Requirement for data collection, analysis or repatriation**	**Activities, equipment and Cost**	**Total cost for activities (USD)**
1	Assess prawn stocks	Ship-based sampling from Research Vessel (12 days per month x 4 months 1. Perdiems 4 scientists @USD 100 =USD 19,200 2. Perdiems 4 for technicians @USD 60 = USD 11,520 3. Consumables USD 2,500 4. Fuel supply (cars) USD 200 5. Hiring a Research Vessel USD 50,000 Shore based sampling from artisanal fishers for 8 days 1. Perdiems for 2 scientist @USD	93,055

		100 =USD 3,200 2. Perdiems for 4 technicians @USD 60 =USD 3,840 3. Perdiem for 2 drivers @USD 60 =USD 1,920 4. Fuel for field work USD 675	
	Assess biomass and potential yields of lobster	Shore based sampling from artisanal fishers for 8 days per month for 12 months 1. Perdiems for 6 technicians @USD 30 =USD 17,280 2. Vernia Callipers 6@USD 10 =USD 60 3. Ground transport USD 100 4. Stationery USD 100	17,540
	Assess population, maturity weight and breeding period of Octopus.	Shore based sampling from artisanal fishers for 8 days per month for 12 months 1. Perdiems for 6 technicians @USD 30 =USD 17,280 2. Weighing equipment USD 600 3. Ground transport USD 100 4. Stationery USD 100	16,880
	Assess biomass and potential yields of squids and cuttlefish.	1. . Perdiems 4 scientists @USD 100 =USD 19,200 2. Perdiems 4 for technicians @USD60 = USD 11,520 3. Consumables USD 2,500 4. Fuel supply (cars) USD 200 5. Hiring a Research Vessel USD 50,000	83,420
	Conduct an assessment of the sea cucumber stocks and their habitats.	**Shallow sampling methods equipment** Dinghy =USD 15,000 GPS =USD 600 Belt transect 100m X 8m= USD 100 2 divers @USD 500x20days = USD 20,000 Use chainman to measure transect length USD 100 **Deep sampling methods equipment** Drop camera (SeaViewer) USD 700 GPS to measure transect length 2 divers @USD 500x20days = USD 20,000	56,500
	Identify and map critical dugong habitats (sea grasses) in Tanzania.	1. Village meetings 40@USD 100=USD 4000 2. Posters14000@USD 0.3 =USD 4,200 3. Travel / transport car fuel and boat hire USD 5,000 4. Car hire USD 4,000 5. Habitat mapping study USD 2000 6. Admin/Coordination USD 2,400	21,600
2	Assess finfish stocks in the	Ship-based sampling from Research	129,880

	territorial waters.	Vessel (12 days per month x 4 months 6. Perdiems 6 scientists @USD 100 =USD 28,800 7. Perdiems 6 for technicians @USD60 = USD 17,280 8. Consumables USD 3,500 9. Fuel supply (cars) USD 300 10. Hiring a Research Vessel USD 80,000	

2.10 **Long term predicted atmospheric changes**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (USD)
1	Modelling of long term predictions – Invite regional expert to assist local scientists in analyzing historic data	1) Air transport (USD 1,000.0) 2) Subsistence allowance for regional expert for 15 days (USD3,000.0) 3) Fees for regional expert (USD 10,000.0) 4) Allowance for 3 scientists for 14 days (USD 4,500)	18,500
2	Retrieval of oceanographic data from historic surveys and past expeditions	1) Allowance for 3 scientists for 14 days (USD 4,500)	4,500

3.0 **HUMAN ENVIRONMENT**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (USD)
1	Socioeconomic status of the coastal communities and population distribution	5) Purchase GIS and other accessories (USD 8,000) 6) Transport and subsistence allowances to Field assistants (USD 8,000) 7) Local inputs (USD 15,000.0) 8) Two zone stakeholder workshop (USD 45,000)	76,000
2	Assessment of level of pollution is Coastal areas and population dynamics in coastal regions	3) Field allowance for 8 local staff for 20 days (USD 8,000) 4) Local inputs for mapping (USD 10,000.0)	18,000
3	Mapping of sites of religious and cultural significance and its current status	4) Transport (USD5000) 5) Local inputs for mapping (USD10,000.0)	15,000.0
4	Mapping coastal infrastructure showing their current status and spatial distribution	1) Transport (USD 8,000.0) 2) Subsistence allowance for regional expert for 20 days (USD 8,000.0) 3) Allowance for 3 local experts for 15 days (USD 6,000.0)	24,000

2.7 & 6.0 **Coastal zone and continental shelf**, **PLANNING AND MANAGEMENT**

Priority	Requirement for data collection, analysis or repatriation	Activities, equipment and Cost	Total cost for activities (USD)
1	Mapping the distribution and densities of seagrass beds.	1) Purchasing high resolution satellite imagery (USD 50,000.0) 2) Medium boat hire and fuel for 60 days (USD 12,000.0) 3) Air transport (USD 2,000.0) 4) Subsistence allowance for regional expert for 60 days (USD 12,000.0) 5) Local inputs (USD 30,000.0)	106,000.0
2	Conduct mangrove change detection using current satellite imagery and 2000 GIS data developed by Wang *et al.* (2000).	1) Purchasing current six (6) Landsat scenes (USD 2,400.0) 2) Field allowance for ground truthing for 4 local staff for 20 days (USD 8,000) 3) Local inputs for mapping (USD 50,000.0)	60,400.0
3	Assessment of the impacts of sedimentation to coral reefs resulting from speedboats, both small and large (especially the boats that travel between Zanzibar and Dar es Salaam).	(i) Subsistence allowance for regional expert for 30 days (USD 6,000.0) (ii) Allowance for 3 local experts for 30 days (USD 9,000.0) (iii) Transport and hiring diving gears for the experts (USD 20,000)	35,000.0
4	Systematic monitoring for coral reefs (geographically and temporally).		
5	To determine the cover and species densities of seagrass beds and extent to which threats pose a problem.		
6	To determine the actual length of the shoreline	(i) Purchase high resolution (QuickBird, Ikonos, WorldViewer imagery) (ii) Interpretation of imagery (iii) Categorise the shoreline- Mainland, Island, Islets and the straight line	
7	Determine land use and cover changes and identify urban sprawling and disaster prone areas	1) Downloading DEM data for Coastal Rivers Catchment areas (USD 500.0) 2) Purchasing six (6) archival and current landsat imagery (USD 2500 3) Preparation of maps and determine areas of change (USD 25000)	28,000
8	Modelling of the dynamics of coastal waters with respect to oil spill movement, tsunami/other seismic incidences run-up, storm surges - Invite regional expert to assist local experts in developing	1) Air transport (USD 2,000.0) 2) Subsistence allowance for regional expert for 20 days (USD 4,000.0) 3) Allowance for 3 local experts for 15 days (USD 6,000.0) 4) Transport for local experts (USD 300)	12,300.0

	the model. Outputs: currents, oil spill movement, directions, spatial distribution, etc		
9	Mapping sand beaches showing their richness for feeding and nesting of the various species. Invite regional expert to assist local scientists.	1) Air transport (USD 2,000.0) 2) Subsistence allowance for regional expert for 30 days (USD 6,000.0) 3) Allowance for 3 local experts for 30 days (USD 9,000.0) 4) Transport for field trips by local experts (USD 4,500)	21,500
10	Mapping of the current extent of urban sprawling.	1) Purchasing six (6) current satellite imagery (USD 2,400.0) 2) Local inputs for mapping (USD 15,000.0)	17,400
11	Reviewing responsibilities of the different government institutions/departments (forests, fisheries, wildlife, agriculture, ports, surveying of land and issuing of titles, and mineral mining) to address existing conflicts	1) Two Zonal Stakeholders workshop to identify controversial issues (USD 40,000.0) 2) Reviewing sector Policies and Laws by 4 local staff for 20 man-days (USD 40,000.0) 3) Stakeholders feedback workshop (USD 30,000) 4) Compilation and submission of final document to responsible sectors (USD 10,000)	120,000.0
12	Improve fisheries data storage, retrieving and backup system. Assessment of the existing fisheries databases and the formats of their datasets in order to harmonize and facilitate data sharing and communication.	8) Allowances for 2 local experts for 15 days for assessing the existing fisheries database and datasets format (USD 4,000.0). 9) Allowances for 2 local experts for 30 days for reviewing formats used by other sectors' databases (USD 8,000.0) 10) Compilation of a report on suggested system and data formats to be used by the Fisheries (USD 2,000.0).	14,000