Coastal Profile for Tanzania Mainland 2015
Portfolio of Actions – Volume V

Final Draft

Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania

NORDIC DEVELOPMENT FUND

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Acronyms[1]

Addax	International oil and gas exploration and production company
AEWA	African-Eurasian Waterbird Agreement
AGIP	Azienda Generale Italiana Petroli (General Italian Oil Company)
BG	British Gas
BMU	Beach Management Units
BoE	Barrels of oil Equivalent
CAMARTEC	Center for Agricultural Mechanization and Rural Technology
CARE	Cooperative for Assistance and Relief Everywhere
CBNRM	Community Based Natural Resource Management
CC	Carrying Capacity
CFMA	Collaborative Fisheries Management Areas
CFMU	Collaborative Fisheries Management Units
CITES	Convention on International Trade in Endangered Species
CMCA	Community Marine Conservation Areas
CMIP	Coupled Model Intercomparison Project
CNPC	China National Petroleum Corporation
CPTDC	China Petroleum and Technology Development Company
CPUE	Catch per Unit Effort
CPUF	Catch per Unit Fisher
CPUFV	Catch per Unit Fishing Vessel
CRIAM	Coastal Rapid Impact Assessment Matrix
CRIF	Coral Reef Information System
CSAG	Climate Systems Analysis Group (University of Cape Town)
CTI	Confederation of Tanzania Industries
DCCFF	Department of Commercial Crops, Fruits and Forestry
DDT	dichlorodiphenyltrichloroethane
DED	District Executive Director
DEM	Digital Elevation Model
DFMP	Department of Fisheries and Marine Products
DoE	Department of Environment
DSFA	Deep Sea Fishing Authority
DSS	Decision Support System
DWT	Dead Weight Tonnage
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
Engen	Energy company focusing on the downstream refined petroleum products
EPZ	Economic Promotion Zone
EPZA	Export Processing Zones Authority
ERA-Interim	Model for near real time reanalysis used by the European Centre for Medium-Range Weather Forecasts
ESRF	Economic and Social Research Foundation
EV	Evaluation Value calculated in CRIAM
EWURA	Energy and Water Utilities Authority
EximBank	China Export-Import Bank
FDD	Fisheries Development Division
FMP	Fisheries Management Plans
FYDP	National Fisheries Development Plan
GapCo	Gulf Africa Petroleum Corporation
GapOil	Retailers and marketer of petroleum products (GapCo subsidiary)

[1] The list of abbreviations and acronyms has been compiled for all five volumes of the coastal profile.

GCAP	Global Climate Adaptation Partnership
GCM	General Circulation Model
GDP	Gross Domestic Product
GHG	Green House Gasses
GIS	Geographical Information System
GoT	Government of Tanzania
GOZ	Government of Zanzibar
GPS	Global Positioning System
GSM	Global System for Mobile communication
HAT	Hotel Association of Tanzania
HEP	Hydro Electric Power
HIMA	Hifadhi Misitu ya Asili
HIV/AIDS	Human Immunodeficiency Virus/Acquired ImmunoDeficiency Syndrome
IBA	Important Bird Areas
ICM	Integrated Coastal Management
ICT	Information and Communication Technology
ICZM	Integrated Coastal Zone Management
IDD	Iodine Deficiency Disorder
IIDS	Integrated Industrial Development Strategy
IMS	Institute of Marine Sciences
IOD	Indian Ocean Dipole
IPCC	Intergovernmental Panel on Climate Change
ISCP	Innovation Systems and Cluster Programme
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
KNMI	Koninklijk Nederlands Meteorologisch Instituut (Royal Dutch Meteorological Institute)
LEAT	Lawyers' Environmental Action Team
LGA	Local Government Authority
LNG	Liquefied Natural Gas
LUP	Land Use Plans
MACEMP	Marine and Coastal Environmental Management Project
MAFSC	Ministry of Agriculture, Food Security and Cooperatives
MALE	Ministry of Agriculture, Livestock and Environment, Zanzibar
MANREC	Ministry of Agriculture, Natural Resources, Environment and Cooperatives
MARUHUBI	Zanzibar Institute of Tourism
MCS	Marine Control and Surveillance
MCU	Marine Conservation Unit
MIC	Ministry of Infrastructure and Communications
MIMCA	Mnemba Island Marine Conservation Area
MIT	Ministry of Industry and Trade
MKURABITA	Property and Business Formalization Program
MKUZA II	Zanzibar Strategy for Growth and Poverty Reduction
MLFD	Ministry of Livestock and Fisheries Development
MNRT	Ministry of Natural Resources and Tourism
MoT	Ministry of Transport
MOW	Ministry of Water
MoW	Ministry of Works
MPA	Marine Protected Area
MRPU	Marine Reserves and Park Unit
MSME	Micro, Small and Medium Enterprises
MSY	Maximum Sustainable Yield
MUKUTA	National Strategy for Growth and Reduction of Poverty (NSGRP)
MVIWATA	Mtandaowa Vikundivya Wakulimawa Tanzania (farmers network)
NAPA	National Adaptation Programme of Action
NAWAPO	National Water Policy

NAWESCO	National Sustainable Wetlands Management Steering Committee
NBS	National Bureau of Statistics
NDC	National Development Corporation
NEMC	National Environmental Management Council
NFP	National Forest Programme
NGO	Non-Government Organisation
NICEMS	National Integrated Coastal Environment Management Strategy
NSGRP	National Strategy for Growth and Reduction of Poverty
PCB	Polychlorinated Biphenyl
PMO-RALG	Prime Minister's Office for Regional and Local Government
PSA	Production Sharing Agreement
Ramsar	International convention on wetlands management
REDD	Reducing Emissions from Deforestation and forest Degradation
RIAM	Rapid Impact Assessment Matrix
RV	Range Value calculated in CRIAM
SACCOS	Savings and Credit Cooperative Organizations
SAGCOT	Southern Agriculture Corridor of Tanzania
SCUBA	Self-Contained Underwater Breathing Apparatus
SEC	South Equatorial Current
SESIA	Strategic Environmental and Social Impact Assessment
SEZ	Special Economic Zone
SIDO	Small Industries Development Organization
SIDP	Sustainable Industrial Development Policy
SME	Small and Medium sized Enterprises
SMOLE	Sustainable Management of Land and Environment
SPM	Single Point Mooring
SSHS	Saffir-Simpson Hurricane Scale
SST	Sea Surface Temperature
STCDA	Stone Town Conservation and Development Authority
SUMATRA	Surface and Marine Transport Regulatory Authority
SWMP	Sustainable Wetlands Management
TAA	Tanzania Airports Authority
TAFORI	Tanzania Forestry Research Institute
TAMPA	Tanzania Milk Processors Association
TAMPRODA	Tanzania Milk Producers Association
TANESCO	Tanzania Electric Supply Company Limited
TASONABI	Tanzania Specialist Organisation on Community Natural Resources and Biodiversity Conservation
TASPA	Tanzania Salt Producers Association
TATO	Tanzanian Association of Tour Operators
TAWA	Tanzania Wildlife Authority
TAZARA	Tanzania-Zambia Railway
TCAA	Tanzania Civil Aviation Authority
TCCIA	Tanzania Chamber of Commerce, Industries and Agriculture
TCF	Trillion Cubic Feet
TCMP	Tanzania Coastal Management Partnership
TCPL	Trans Canada Pipeline Limited
TD	Tropical Depression
TEMDO	Tanzania Engineering and Manufacturing Design Organization
TEU	Twenty-foot Equivalent Units
TFCG	Tanzania Forest Conservation Group
TFNC	Tanzania Food and Nutrition Centre
TFS	Tanzania Forest Services
TGFA	Tanzania Government Flight Agency
TIPER	Tanzania Italian Petroleum Oil Refinery
TIRDO	Tanzania Industrial Research Development Organization
TLU	Total Livestock Units

TMA	Tanzania Meteorological Agency
TNBC	Tanzanian National Business Council
TNRF	Tanzania Natural Resources Forum
TPA	Tanzania Ports Authority
TPCC	Tanzania Portland Cement Company
TPDC	Tanzania Petroleum Development Corporation
TPSF	Tanzania Private Sector Foundation
TRAFFIC	The Wildlife Trade Monitoring Network
TS	Tropical Storm
TSH	Tanzania Currency Unit
TTB	Tanzania Tourist Board
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFPA	United Nations Population Fund
URT	United Republic of Tanzania
USD	United States Currency Unit
USDM	University of Dar es Salaam
VAT	Value Added Tax
VICOBA	Village Community Banks
VLFR	Village Land Forest Reserves
VPO	Vice President's Office
WB	World Bank
WCST	Wildlife Conservation Society of Tanzania
WRIAM	Water Resources Impact Assessment Matrix
WWF	World Wildlife Fund
ZATI	Zanzibar Association of Tourism Investors
ZATO	Zanzibar Association of Tour Operators
ZAWA	Zanzibar Water Authority
ZCT	Zanzibar Commission for Tourism
ZECO	Zanzibar Electricity Corporation
ZIPA	Zanzibar Investment Promotion Authority
ZNCCIA	Zanzibar National Chamber of Commerce, Industry and Agriculture
ZPC	Zanzibar Port Corporation
ZPRP	Zanzibar Poverty Reduction Plan

Table of Units

BoE	Barrels of oil Equivalent
ft	feet
ha	hectare
km	kilometre
km^2	square kilometre
m	meter
m^2	square meter
m^3	cubic meter
Mm^3	Million cubic metres
mmscf	million standard cubic feet
MV	Mega Volt
MW	Mega Watt
s	second
TCF	Trillion Cubic Feet
TEU	Twenty-foot Equivalent Units

Introduction

Tanzania Coastal Zone

The coastal zone in Tanzania is under development pressure induced by population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders depending on the coast for their livelihood. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather.

In order to address these management challenges the Government of Tanzania with World Bank assistance has through the project "Investment Prioritization for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.

The Project

The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.

The objective of the study is to prioritise geographically and thematically the actions to promote sustainable coastal livelihoods and ecosystems in Tanzania (both Mainland and Zanzibar). The results comprise proposals for measures for coastal management and climate change adaptation in Tanzania, which the Government of Tanzania, NGOs, and donors can use to guide their support and investments over a five year period.

Further details on the project are provided in the thematic part of the Coastal Profile for Tanzania and Zanzibar (Volume I).

Partners

The study is financed by the World Bank (WB) with trust funds provided by Nordic Development Fund (NDF).

The client for the project is Fisheries Department at the Ministry for Livestock and Fisheries Development (MLFD) in Dar es Salaam and the Department of Fisheries and Marine Resources at the Ministry of Agriculture, Livestock and Environment (MALE) in Zanzibar.

The consultants carrying out the study are DHI from Denmark and SAMAKI Consultants from Tanzania.

Study Objectives

The objective of the study is to prioritize geographically and thematically the actions to promote sustainable coastal livelihoods and ecosystems in Tanzania (both Mainland and Zanzibar). The results comprise proposals for measures for coastal management and climate change adaptation in Tanzania, which the Government of Tanzania, NGOs, and donors can use to guide their support and investments over a five year period. Specific objectives are:

1. Conduct a review of current coastal management and climate change adaptation studies and planning activities in Tanzania Mainland and Zanzibar, including an inventory of data and information available;

2. Identify, analyse and geographically locate the most important livelihood sources of Tanzania's coastal communities, and the ecosystems on which they depend;
3. Assess the economic costs of climate change on coastal communities and analyse the adaptive capacity of these communities;
4. Identify and geographically locate a gross list of major climate-related threats to sustain these livelihood sources and the ecosystems they depend on;
5. Evaluate the gross list of threats in terms of probability of occurrence, prediction confidence, and consequences if a 'business as usual' scenario is applied;
6. Identify possible adaptation measures to mitigate the threats and evaluate these measures in terms of cost-benefit efficiency and reasonability to implement;
7. Analyse the characteristics of the threats and adaptation measures to prioritize them and identify the most urgent and important investments for sustainable coastal livelihoods and ecosystems;
8. Identify on-going and planned projects supporting coastal management and climate change initiatives in coastal areas, and recognize overlaps with the above found priorities;
9. Identify data monitoring and research needs that should be addressed to augment the implementation and sustainability of the recommended investments;
10. Establish a GIS data base to document the results from the above objectives to the extent possible. The data base should be used as the basis upon which to undertake spatial analysis and thereby assist in prioritizing adaptation investments, based in large part on the characteristics and geographic locations of the major threats to sustainable livelihood sources.;
11. Develop an action plan for priority investment in the short-term (next five years) under multiple funding scenarios. The action plan should consider the prioritization results, total estimated costs compared to assumed available funds, and possible overlaps with existing initiatives. It should be specified whether the investments are targeted for Tanzania Mainland or Zanzibar.

The Coastal Profile

The coastal profile is based primarily on secondary data, acquired from key stakeholders during the extended inception period. A database has been established listing all relevant documents identified and linkages to soft copies have been included as available.

A Geographical Information Systems (GIS) has been established to contain acquired themes. The GIS has furthermore been used to examine inundation and flooding consequences of various Sea Level Rise scenarios. These analyses have been based on a Digital Elevation Model (DEM) developed for the coastal areas of the country. The GIS has also been used to produce district level statistical information.

The coastal profile is presented in five volumes:

Volume I: Coastal Themes, presenting the situation in the coastal zone thematically, i.e. from the perspective of various sectors and other country wide themes. There are separate volumes for Mainland Tanzania and Zanzibar.

Volume II: Coastal Districts, offering an overview of the situation in the coastal zone of each district, localising and adding detail to the information in Volume I. There are separate volumes for Mainland Tanzania and Zanzibar.

Volume III: Maps and Tables, presenting thematic and district maps in A3 format and offering tabulated information, collected from documents consulted or generated from the GIS. This is a combined volume for Mainland Tanzania and Zanzibar.

Volume IV: Overall Threat Mitigation, presenting action areas for the identified threats emerging from discussions in the two working groups established after the Inception stakeholder meetings. The working groups, one in Zanzibar and one in Dar es Salaam, assisted in validating and prioritising threats and in proposing overall adaption measures to address such threats. This is a combined volume for Mainland Tanzania and Zanzibar.

Volume V: A portfolio of prioritised actions to address threats to local communities and ecosystems in the coastal areas of Mainland Tanzania and Zanzibar. There are separate volumes for Mainland Tanzania and Zanzibar.

This is Volume V of the Coastal Profile for Mainland Tanzania.

Organization of Volume V

Volume V is organised in the following Sections:

- Introduction

A general introduction to the project as provided in all volumes of the coastal profile. This is followed by the current overview of the organization of Volume V of the Coastal Profile.

- Methodological Approach

The development of actions targeted by the study has been carried out in a sequence of steps. The methodology applied is presented and discussed in this section. The steps are:

i) identification and prioritization of threats to coastal communities and livelihoods through a structured update of coastal information based on available information and dialogues with key stakeholders and followed by a validation and a threat prioritization effort in broader stakeholder workshops;

ii) a rapid assessment of threat susceptibility to climate change applying a coarse ranking approach for each identified threat within different climate impact dimensions;

iii) participatory identification of broad management measures that could be applied for mitigating threats;

iv) a screening of action areas with the view of generating a shortlist of priority interventions for further detailing and

v) structured action formulation and compilation of a portfolio priority actions.

- Prioritized Actions

This key section of Volume V provides a summary overview of all actions followed by full actions sheets for all prioritised actions.

Methodological Approach

The study has adopted a sequential approach to formulating actions to promote sustainable coastal livelihoods and ecosystems as illustrated in Figure 1. It is recognised that the methodology applied is rapid to satisfy the requirement for early mobilization of urgent actions and that analyses and assessments in many cases rely on experiences and local knowledge, rather than on a comprehensive information base. The portfolio of actions formulated through the process serves to provide a holistic overview of the most pertinent interventions required in the short term to mitigate the current development problems in coastal areas. Each of these intervention requires further appraisals before decisions are made to develop full projects.

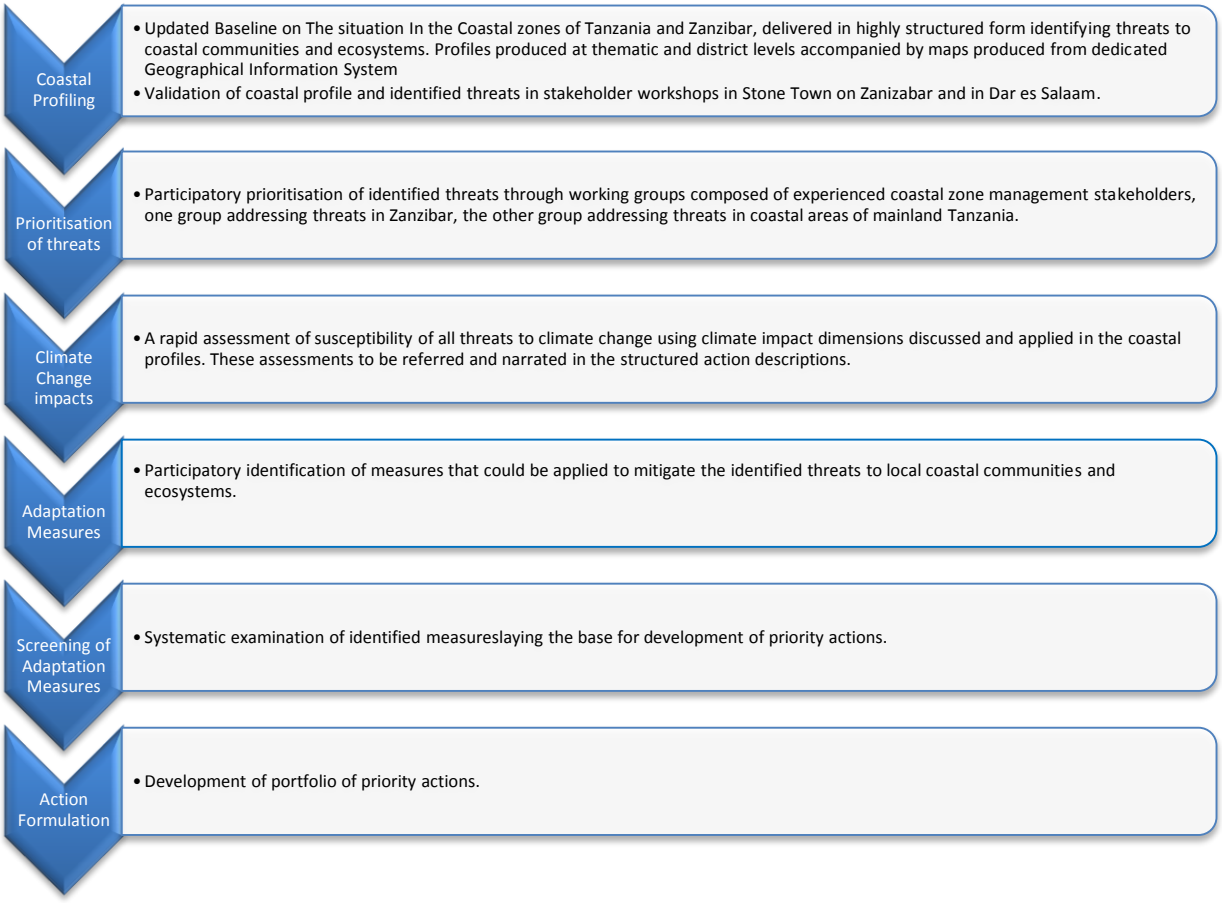


Figure 1: Sequence of study activities towards action formulation.

The lack of information in itself is one of major constraints to good decision making and planning in the complex situations prevailing along the coasts, and the development of a comprehensive information infrastructure to support development planning is a major requirement.

The following sections add some more detail to each of these steps.

Identification and Prioritisation of Threats to Coastal Communities and Livelihoods

Structured update of Coastal Profile

The first step in the study has been to examine current information available in Tanzania and Zanzibar on the situation in the coastal areas. A very structured approach has been applied to provide the systematic and holistic description offered in the first edition (version 0) of the coastal profiles. The first edition was organized in three separate volumes for Tanzania mainland and Zanzibar respectively:

- Volume I, giving a thematic overview covering natural resources and economic sectors and also discussing local communities, climate change and shoreline conditions. A general description of each sector was provided covering resources and their management, discussing economic and socio-economic importance and identifying sector associated threats to local communities. These threats were further discussed to evaluate to which extend they were influenced by climate change and a brief general outlook for the sector was given.
- Volume II, providing a geographical perspective presenting the coastal situation by district for mainland Tanzania and by region for Zanzibar. For each district or region an overview is given covering climate, population and the economy basis. This is followed by a more detailed description of the local coastal environment, encompassing physical, ecological, water, marine species, natural resources, settlements and infrastructure dimensions. Major threats to local communities have been identified and vulnerability to climate change assessed in brought terms, particularly with respect to sea level rise. Finally significant local projects and plans are described with a bearing on coastal conditions.
- Volume III, presenting maps and statistical information generated from the geographical information system that has been built to support the coastal profiles and analyses under the study.

The initial baseline thus produced consists of the following documents:

- Coastal Profile for Tanzania Mainland 2014 Thematic Volume – Draft 0
- Coastal Profile for Tanzania Mainland 2014 District Volume – Draft 0
- Coastal Profile for Zanzibar 2014 Thematic Volume – Draft 0
- Coastal Profile for Zanzibar 2014 Region Volume – Draft 0
- Coastal Profile for Tanzania 2014 - Map and Table Volume – Draft 0

These are available in digital versions (pdf), which have been broadly disseminated to stakeholders in connection with the Inception Stakeholder dialogues held in Stone Town and Dar es Salaam in April 2014.

Participatory evaluation and prioritization of threats

The initial coastal profiles were developed based on a compilation of existing documents and information and on dialogues with a range of stakeholders in the data acquisition process. A more comprehensive validation of the coastal profiles was achieved through two stakeholder workshops held in Stone Town for the Zanzibar Profile and in Dar es Salaam for the Mainland Tanzania Profile, both in April 2014. These workshops were attended by a large number of government as well as non-government stakeholders and encompassing central as well as local administration, private sector professionals, academia, civil society and NGOs. The workshops were designed to provide feedback on the coastal profiles with a special emphasis

on the identified threats to local communities and coastal livelihoods, while at the same time initiating a discussion on prioritization of these threats.

A tool to support the prioritization of threats was presented and tested during the workshops. The "Coastal Rapid Impact Assessment Matrix (CRIAM)" uses a set of 5 criteria (geographical extent, magnitude, permanence, reversibility and cumulativeness) to rank the severity of threats and it was applied to rank all threats in the thematic volumes of the coastal profiles looking at the severity from a central management level and all the threats identified in the district and regional volumes applying a local management angle.

To consolidate the CRIAM assessments two smaller working groups were formed in Dar es Salaam and Zanzibar to systematically review, assess and prioritise all identified threats. The results from the working group sessions in June 2014 have since been incorporated into separate sub-chapters in an expanded version of the coastal profiles. The overall ranking of problems are also tabulated in the thematic and district/region sections of Volume IV of the Coastal Profile.

More details about the CRIAM method, the participation in the stakeholder workshops and the composition of the working groups are provided in annexes to the thematic and district volumes of the coastal profiles (Volumes I and II).

Rapid Assessment of Threat Susceptibility to Climate Change

A further step in the study has then been to carry out a broad examination of all identified threats as to how susceptible these treats are to be further impacted by climate change using the following areas of impact, discussed in the thematic coastal profiles:

- Changes in weather patterns
- Extreme weather events
- Sea-level rise
- Seawater temperature rise
- Seawater acidification

Within each area the climate change impact has been ranked as follows:

+++	Threat is severely aggravated from climate change dimension
++	Threat is aggravated from climate change dimension
+	Threat is slightly aggravated from climate change dimension
0	No influence of threat from climate change dimension
-	Remediating effect on threat from climate change dimension

The examination of such climate change impacts is presented in the thematic and sector sections of Volume IV of the Coastal Profile.

Additional comments are given in the tabulations as relevant. The evaluations are intended to inform the final portfolio of prioritized actions in climate change sub-sections of each action profile.

Threat Mitigation Measures

The two working groups also in the June 2014 work sessions considered what broad measures could be taken to mitigate the prioritized threats. The broad measures brought forward fell into a series of management dimensions. For many threats measures suggested included several to many of these dimensions, reflecting the complexity of the situation in the coastal areas and underscoring the need for management to adopt a holistic approach and consider

integrated solutions in a framework that provides for coordination between many actors. The management dimensions identified for threat mitigation included:

- Integrated Coastal Zone Management (ICZM)
- Integrated Water Resources Management (IWRM)
- Land Use Management
- Shoreline Management Planning
- Solid and Liquid Waste Management
- Sanitation
- Capacity building
- Technology
- Law enforcement
- Legal Review
- Alternative/Improved Livelihood
- Awareness raising
- Education

The measures suggested by the working groups have been further processed and organized in tables by theme and by district/region in Volume IV of the Coastal Profile. From these tables a number of action areas have been extracted for final screening before developing more detailed action sheets.

Screening Matrices

The extracted action areas have been entered into screening matrices and subjected to an initial evaluation based on general knowledge and site-specific conditions. This is a qualitative evaluation, where each measure is narratively evaluated against the following criteria:

Win/win[2]. Does the action measure have positive impact on other management challenges or opportunities?

Regret/No Regret[3]. Is the action measure beneficial without climate change impact?

Flexibility. Is the action measure receptive for adjustments according to new knowledge? The predictions of threat impact/development and of climate change impacts may at present be associated with high degree of uncertainty and new knowledge and information may require adjusted or different adaptation measures.

Resilience[4]. Does the action measure make the management system more robust in responding to the threat and climate change impacts?

Urgency. How will the implementation of the action measure be influenced if it is delayed? Impact of threat and climate change may not be catastrophic events, but may develop gradually. As the impact however may influence decisions/structures with long lifetimes

[2] Where everyone gains an advantage – in this case: initiatives that benefits more than one aspect/interest group.

[3]'No-regrets solutions' are those which are feasible and beneficial even if the climate does not change as expected (or does not change at all, for that sake). They are attractive in a context where action is required, but set against a background of incomplete financial resources and uncertainty about exactly how the climate will change in the time to come.

[4]Climate resilience is the ability to withstand a climate-related pressure, or to recover from an adverse climate-related event. Climate resilience is an important cross-cutting development goal in a context of high vulnerability and increasing exposure to climate-related pressures and events.

(planning horizons), lack of actions can eventually have huge implications on adaptation options and costs.

Political acceptability. Does the action measure require awareness raising and sensitization of the political process or has it already been addressed in policies.

Costs. Are huge investments associated with the action measure?

In an attempt to provide a prioritized assessment, each action area has been translated into scores ranging from "**+ + +**" for the best positive score, through "**0**" as neutral, to "**-- -**" as the worst score. Positive and negative scores are added separately allowing the following rating of the implementation measures:

High positive score = high priority in implementation

High negative score = a high level of controversy, high cost or otherwise problematic measure.

In the matrices the adaptation measures have been ranked according to the level of positive scoring. The negative score, if any, for a given adaptation measure emphasizes that careful planning and design must be carried out specifically seeking to minimize these negative aspects prior to implementation.

The currently evaluated measures, the evaluation criteria and the actual scores might be incomplete and may not reflect the actual situation in a fully objective manner. Therefore the screening matrices need to be updated and / or extended appropriately through interactive participation of local stakeholders.

The assessments made have been included as tables in the thematic and district/region sections of Volume IV of the Coastal Profile Version 1. In the narrative part of these sections recommendations are made for which action areas should be further processed into action sheets for inclusion in the portfolio of prioritised actions.

Action Formulation

The final step in the study has been to develop a portfolio of actions constituting a holistically generated overview of priority actions to address threats faced by local communities and ecosystems. Each action is presented in a uniform manner applying the format presented in Table 1, below. This format has been chosen as it is aligned to LFA formats extensively used as basis for development of Project Documents. It should be understood that the action sheets thus prepared do not provide the basis for committing financing for the action. Such commitment necessitates further more dedicated evaluations. The portfolio of actions on the other hand does give a holistic overview of high priority interventions required to mitigate the most pertinent threats to local communities and ecosystems in coastal areas of Mainland Tanzania and Zanzibar. As such the portfolio can provide the basis for government and development partners to agree on distribution of efforts needed to further appraise the feasibility of implementing actions contained in the portfolio.

The portfolio of actions has been prepared as Volume V of the Coastal Profile, one for Mainland Tanzania and one for Zanzibar. This is Volume V of the Coastal Profile for Mainland Tanzania.

Table 1: Format for Action Sheets

Background:	*A brief presentation of the setting for the prioritised action. This presentation will as relevant draw on the GIS and make reference to information and knowledge acquired in reviews and in stakeholder dialogue.*	
Title:	*The title of the actions agreed upon in stakeholder dialogues.*	
Action Reference:	*Unique identifier for action database and other references.*	
Justification:	*Provide statements justifying that this action should be considered for funding. The statements can draw on the outcome of the prioritization and screening efforts.*	
Objective:	*Establish what the action if implemented is expected to achieve.*	
Expected outputs:	*Identify key outputs required to fulfil the objective.*	
Activities:	*List key activities that have to take place to produce the outputs.*	
Assumptions:	*State what assumptions concerning conditions outside the control of the action that must be met.*	
Risks:	*Identify risks that the source of funding and the responsible for the action should be aware of and try to mitigate.*	
Means of implementation:	Logistics, technical, scientific	*Outline expectations for logistic requirements, technical and scientific environment.*
	Human Resources	*Outline expectations on human resources engagement*
Budget estimate:	*Provide an assessment of budget requirements in very broad terms as detailed assessments can only be made in project appraisal and detailed design. The budget requirements may assess both project preparation (appraisal and design) and project implementation dimensions*	
Source of funding:	*Identify potential funding sources, including government, development partners, private sector, etc. or combination thereof if applicable. The identification should to the extent possible be aligned with strategies and plans of the funding sources.*	
Responsible for the action:	*Identify which institutions would be responsible for implementing the action, government and or non-government. One institution should be overall responsible but contributing institutions should as applicable also be identified.*	
Beneficiary from the action:	*Make qualitative assessment of beneficiary (ies). Quantitative assessment of beneficiary (ies) can at best made in very broad terms until appraisal.*	
Schedule:	*Indicate a time schedule for the implementation of the action The time schedule overarching the actions is 5 years.*	
Links to other actions:	*Identify and explain linkages to other actions*	
Performance indicators:	*Identify verifiable performance indicators that can be used to monitor the implementation of the action.*	
Comments:	*Provide any comments that are considered useful for the considerations by funding sources and institutions responsible for the action.*	

Prioritised Actions

The remaining part of this Volume V presents the portfolio of prioritised actions to address the threats identified to local coastal communities and ecosystems in Zanzibar.

A small summary of actions is provided introducing the portfolio after which a structured presentation of each action is given in the action sheet format mentioned above.

Summary of Actions

A total of 63 prioritised actions have been identified and included in this portfolio of action sheets, out of which 9 are considered systemic and 54 local.

Systemic actions are actions directed towards improving the enabling environment for sustainable management of the development in the coastal zone. In this sense the systemic actions will be supportive for all local actions. They have been identified based on the mitigation intervention analysis in Volume IV of the Coastal Profile. These analyses considered both the thematic threats described in Volume I and the district/region threats described in Volume IV of the coastal profile. An important action concerns information management which has been discussed in the volumes mentioned above but which emerges particularly from the work carried out linked to the GIS described in Volume III of the Coastal Profile.

Local actions are more site specific actions derived from mitigation measures addressing threats emerging from district/region level analyses in Volume 2 of the Coastal Profile.

Table 2 below lists and summarises these actions by type, name, location and total cost. The total budget for all 63 actions adds up to USD 657,550,000. Projects are of various sizes cost wise as indicated in Table 2.

Table 2: Number of projects grouped by budget size.

Budget Size group	2 million USD and below	Between 2 and 5 million USD	Between 5 and 10 million USD	Between 10 and 25 million USD	Above 25 million USD
Number of projects	13	6	23	17	4

Table 4 adds further detail to these actions in the form of major activities for each action and their implementation schedule. The schedule covers a 10 years where the first 5 are arranged by quarters. Most activities as required in the scope of work for the study fall within the first 5 year period and includes project design, appraisal and mobilisation, which in most cases has been assessed to require one year. The schedule is ambitious and therefore likely in a detailed project design to be extended with a longer duration.

Table 3: Summary of actions identified actions for Mainland Tanzania

Type	Action Title	Location	Action ID	Cost USD
Systemic	Integrated Coastal Zone Management Framework for Zanzibar	Over-arching	Tan-S01	2.000.000
Systemic	Integrated Spatial Planning	Over-arching	Tan-S02	3.850.000
Systemic	Shoreline Management Policy Framework	Over-arching	Tan-S03	2.000.000
Systemic	Information System as Decision Support for Coastal Development Management	Over-arching	Tan-S04	2.000.000
Systemic	Primary and Secondary Education	Over-arching	Tan-S05	1.800.000

Type	Action Title	Location	Action ID	Cost USD
Systemic	Overall Awareness Raising	Over-arching	Tan-S06	2.450.000
Systemic	Integrated Review of Legal Framework for Coastal Development Management	Over-arching	Tan-S07	1.250.000
Systemic	Support for the NEMC	Over-arching	Tan-S08	1.700.000
Systemic	Support for Tourism Management Planning	Over-arching	Tan-S09	1.250.000
Rivers	Rehabilitation and clean-up of four east-flowing rivers	Mkinga	Tan-L01	13.500.000
Rivers	Rehabilitation and clean-up of Sigi and Mkulumzi rivers	Tanga and Muheza	Tan-L02	13.500.000
Rivers	Rehabilitation and clean-up of lower Pangani River	Pangani and Muheza	Tan-L03	13.500.000
Rivers	Safeguarding of the Wami River	Bagamoyo	Tan-L04	7.500.000
Rivers	Rehabilitation and clean-up of Ruvu River Basin	Bagamoyo	Tan-L05	13.500.000
Rivers	Rehabilitation and clean-up of Mkuza and Mpiji rivers	Bagamoyo and Kinondoni	Tan-L06	13.500.000
Rivers	Rehabilitation and clean-up of seven east-flowing rivers	Kinondoni	Tan-L07	13.500.000
Rivers	Rehabilitation and clean-up of Msimbazi River Basin	Ilala-Kinondoni	Tan-L08	17.700.000
Rivers	Rehabilitation and clean-up of Kizinga and Mzinga river basins, Ilala and Temeke districts	Ilala-Temeke	Tan-L09	13.500.000
Rivers	Safeguarding Nguva River and other rivers in Temeke District	Temeke	Tan-L10	5.500.000
Rivers	Rehabilitation, clean-up and safeguarding the lower Rufiji and Mohoro rivers	Rufiji	Tan-L11	9.200.000
Sanitation	Sewage treatment facility Tanga City	Tanga city	Tan-L12	24.300.000
Sanitation	Sewage treatment facility Pangani Town	Pangani	Tan-L13	24.300.000
Sanitation	Sewage treatment facility Bagamoyo Town	Bagamoyo	Tan-L14	34.300.000
Sanitation	Sewage treatment facility Kinondoni Municipality	Kinondoni	Tan-L15	34.300.000
Sanitation	Sewage treatment facility Ilala Municipality	Ilala	Tan-L16	34.300.000
Sanitation	Sewage treatment facility Temeke Municipality	Temeke	Tan-L17	34.300.000
Sanitation	Sewage treatment facility Kilindoni Town	Mafia	Tan-L18	24.300.000
Sanitation	Sewage treatment facility Kilwa Kivinje Town	Kilwa	Tan-L19	24.300.000
Sanitation	Sewage treatment facility Kilwa Masoko Town	Kilwa	Tan-L20	24.300.000
Sanitation	Sewage treatment facility Lindi Town	Lindi Urban	Tan-L21	24.300.000
Sanitation	Sewage treatment facility Mikindani Town	Mtwara Urban	Tan-L22	24.300.000
Sanitation	Sewage treatment facility Mtwara Town	Mtwara Urban	Tan-L23	24.300.000
Sanitation	Safe toilet facilities for Bwejuu and Jibondo islands, Mafia District	Mafia	Tan-L24	6.800.000
Waste	Urban solid waste collection and processing facility Tanga City	Tanga	Tan-L25	6.800.000
Waste	Urban solid waste collection and processing facility Pangani town	Pangani	Tan-L26	6.800.000
Waste	Urban solid waste collection and processing facility Bagamoyo town	Bagamoyo	Tan-L27	6.800.000
Waste	Urban solid waste collection and processing facility Kinondoni	Kinondoni	Tan-L28	7.800.000

Type	Action Title	Location	Action ID	Cost USD
Waste	Urban solid waste collection and processing facility Ilala	Ilala	Tan-L29	7.800.000
Waste	Urban solid waste collection and processing facility Temeke	Temeke	Tan-L30	7.800.000
Waste	Urban solid waste collection and processing facility Kilindoni	Mafia	Tan-L31	7.800.000
Waste	Urban solid waste collection and processing facility Kilwa Kivinje	Kilwa	Tan-L32	6.800.000
Waste	Urban solid waste collection and processing facility Kilwa Masoko	Kilwa	Tan-L33	6.800.000
Waste	Urban solid waste collection and processing facility Lindi town	Lindi urban	Tan-L34	6.800.000
Waste	Urban solid waste collection and processing facility Mikindani/Mtwara	Mtwara Urban	Tan-L35	6.800.000
Freshwater Supply	Study, review, design and trial freshwater supply options for Tanga City	Tanga	Tan-L36	5.500.000
Freshwater Supply	Study, review, design and trial freshwater supply Lindi Town	Lindi Rural	Tan-L37	6.700.000
Freshwater Supply	Study, review, design and trial freshwater supply options for outlying small islands in the Mafia Island Marine Park	Mafia	Tan-L38	7.700.000
Freshwater Supply	Study, review, design and trial freshwater supply options for outlying villages in Mnazi Bay Ruvuma Estuary Marine Park	Mtwara Rural	Tan-L39	6.700.000
Fisheries	Fisheries sector review by fishery types and management areas	Over-arching	Tan-L40	3.600.000
Fisheries	Small pelagic fisheries support programme for mainland Tanzania	Over-arching	Tan-L41	1.700.000
Fisheries	Support for mainland fisheries monitoring, control and surveillance programme	Over-arching	Tan-L42	5.000.000
Fisheries	Support MCS to end blast fishing	Over-arching	Tan-L43	3.300.000
Fisheries	Strengthening the management of octopus fisheries on mainland Tanzania	Over-arching	Tan-L44	1.000.000
Fisheries	Strengthening the seaweed farming industry on mainland Tanzania	Over-arching	Tan-L45	1.000.000
Fisheries	Tuna fisheries support programme for Mtwara and Lindi Regions	Mafia	Tan-L46	2.600.000
Fisheries	Prawn fisheries support programme for Rufiji District	Rufiji	Tan-L47	1.700.000
Fisheries	Fish farming research and cage trials in Tanga and Kilwa	Tanga	Tan-L48	6.000.000
Erosion	Beach erosion study for coastal Tanzania mainland	Over-arching	Tan-L49	6.600.000
Erosion	Kilwa Kisiwani WH Site,	Kilwa	Tan-L50	3.100.000
Oil Waste	Waste oil treatment facility, DSM Harbour, Tanga Harbour, Kilindoni Harbour (Mafia), Mtwara harbour	Over-arching	Tan-L51	24.300.000
Turtles	Turtle and nesting beach protection	Pangani	Tan-L52	200.000
Urban Plan	Bagamoyo town planning	Bagamoyo	Tan-L53	400.000
Mangrove	Mangrove rehabilitation around Bagamoyo Town	Bagamoyo	Tan-L54	550.000
			Totals	**657,550,000**

Table 4: Schedule of all actions with estimated budgets for key activities

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Grand Total	**All**	**657,550,000**																									
ICZM Framework	**Tan-S01**																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
1) Mobilisation of national ICZM Platform		100,000																									
2) Mobilisation of local ICZM Platforms		200,000																									
3) Establish/update ICZM Baseline		700,000																									
4) ICZM Policy		200,000																									
5) ICZM Action Plan		300,000																									
6) Capacity Building		400,000																									
ICZM Framework	**Total**	**2,000,000**																									
Spatial Planning	**Tan-S02**																										
a) Project design and appraisal.		50,000																									
b) Project tendering		50,000																									
1) Establish/activate inter-sector technical working committees/groups at National and district levels for spatial planning		50,000																									
2) Baseline on state of the spatial planning in Tanzania		100,000																									
3) Spatial planning policy/strategy		100,000																									
4) Situational analysis for spatial planning in coastal Tanzania (overall and district)		1,000,000																									
5) Examine development scenarios for coastal Tanzania (overall and district)		1,000,000																									
6) Prepare spatial plan for coastal Tanzania pursuing preferred development scenarios (overall and district)		1,000,000																									
Capacity Building		500,000																									
Spatial Planning	**Total**	**3,850,000**																									
Shoreline Management	**Tan-S03**																										
a) Project design and appraisal.		50,000																									
b) Project tendering		50,000																									
1) Map and describe sediment cells and sub-cells along the coastline as basis for determining boundaries for Shoreline Management Planning areas and		300,000																									
2) Identify vulnerable areas for detailed shoreline management planning.		200,000																									
3) Vulnerability assessment through Shoreline Management Study and Plan.		400,000																									
4) Identify and quantify erosion/accretion along the coast and translate into management policies and strategies taking projected sea level rise into account.		400,000																									
5) Mainstream shoreline management planning into land use/local planning.		200,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
6) Capacity building		400,000																									
Shoreline Management	**Total**	**2,000,000**																									
Information Management	**Tan-S04**																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
1) Establishment of technical committee		300,000																									
2) Information needs assessment		200,000																									
3) Strategy development		400,000																									
4) Meta database development		400,000																									
5) Updating/consolidating shared database		200,000																									
6) Capacity building		400,000																									
Information Management	**Total**	**2,000,000**																									
Education in Primary and Secondary	**Tan-S05**																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
1) Establish coordination platform between Ministry of Education and schools to participate in action		50,000																									
2) Needs assessment		50,000																									
3) Review of existing curricula and its use		50,000																									
4) Develop revised curricula incorporating coastal issues		100,000																									
5) Develop teaching material		200,000																									
6) Train teachers		200,000																									
7) Test revised curricula in testing schools		400,000																									
8) Evaluate test		50,000																									
9) Capacity building		500,000																									
10) Expansion of programme		100,000																									
Education in Primary and Secondary Schools	**Total**	**1,800,000**																									
Awareness Raising	**Tan-S06**																										
a) Project design and appraisal.		50,000																									
b) Project tendering		50,000																									
1) Establish coordination platform between for action		50,000																									
2) Stakeholder identification and profiling (targets for awareness)		50,000																									
3) Stakeholder Assessment		50,000																									
4) Awareness raising strategy		50,000																									
5) Awareness raising programme		50,000																									
6) Training of press		100,000																									
7) Training of key staff		300,000																									
8) Awareness raising programme implementation		1,000,000																									
9) Impact evaluation among target groups		200,000																									
10) Capacity building		500,000																									
Awareness Raising	**Total**	**2,450,000**																									
Integrated Legal Review	**Tan-S07**																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
1) Establish coordination platform for action		50,000																									
2) Institutional and Legal Baseline		100,000																									
3) Participatory assessment		200,000																									
4) Reform Strategy		50,000																									
5) Action Plan		50,000																									
6) Reform preparation		500,000																									
7) Capacity Building		200,000																									
Integrated Legal Review	**Total**	**1,250,000**																									
Support for the NEMC	**Tan-S08**																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
1) Establish coordination platform for action		50,000																									
2) Stakeholder identification/profiling (targets for awareness)		100,000																									
3) Awareness raising strategy		200,000																									
4) Awareness raising programme		50,000																									
5) Training of key staff and relevant stakeholder on target areas		200,000																									
6) Impact evaluation among target groups		500,000																									
7) Capacity Building		500,000																									
Support for the NEMC	**Total**	**1,700,000**																									
Support for Tourism Management Planning	**Tan-S09**																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
1) Establish coordination platform for action		50,000																									
2) Institutional Baseline		100,000																									
3) Participatory assessment		200,000																									
4) Development of Training Strategy		50,000																									
5) Action Plan		50,000																									
6) Training preparation		500,000																									
7) Capacity Building		200,000																									
Support for Tourism Management Planning	**Total**	**1,250,000**																									
Rehabilitation of four east-flowing rivers in Mkinga District	**Tan-L01**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of four east-flowing rivers in Mkinga District	**Total**	**13,500,000**																									
Rehabilitation of Zigi and Mkulumzi rivers in Tanga Urban and Muheza districts	**Tan-L02**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of Zigi and Mkulumzi rivers in Tanga Urban and Muheza districts	**Total**	**13,500,000**																									
Rehabilitation of lower Pangani River, Pnngani District	**Tan-L03**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of lower Pangani River, Pangani District	**Total**	**13,500,000**																									
Safeguarding the Wami River, Bagamoyo District	**Tan-L04**																										

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		1,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		4,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Safeguarding the Wami River, Bagamoyo District	**Total**	**7,500,000**																									
Rehabilitation of Ruvu River, Bagamoyo District	**Tan-L05**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of Ruvu River, Bagamoyo District	**Total**	**13,500,000**																									
Rehabilitation of Mkuza and Mpiji rivers, Kinondoni District	**Tan-L06**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of Mkuza and Mpiji rivers, Kinondoni District	**Total**	**13,500,000**																									
Rehabilitation of seven rivers, Kinondoni District	**Tan-L07**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of seven rivers, Kinondoni District	**Total**	**13,500,000**																									
Rehabilitation of Msimbazi River Kinondoni - Ilala districts	**Tan-L08**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		5,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		10,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		800,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of Msimbazi River Kinondoni - Ilala districts	**Total**	**17,700,000**																									
Rehabilitation of Kizinga and Mzinga rivers Ilala - Temeke districts	**Tan-L09**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		3,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		8,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of Kizinga and Mzinga rivers Ilala - Temeke districts	**Total**	**13,500,000**																									
Safeguarding Nguva River and other rivers - Temeke District	**Tan-L10**																										
a) Project preparation and mobilisation		100,000																									
b) Mobilisation and review of river basin influences		200,000																									
1) Enforce relevant legislative/regulatory instruments		300,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		1,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		2,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Safeguarding Nguva River and other rivers - Temeke District	**Total**	**5,500,000**																									
Rehabilitation of lower Rufiji River and safeguarding Mohoro River, Rufiji District	**Tan-L11**																										
a) Project preparation and mobilisation		100,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
b) Mobilisation and review of river basin influences		200,000																									
1) Evaluate agrochemical usage and enforce relevant legislative/regulatory instruments		1,000,000																									
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins		1,000,000																									
3) Rehabilitate natural sources of streams and bank vegetation		5,000,000																									
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams		600,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		1,000,000																									
Rehabilitation of lower Rufiji River and safeguarding Mohoro River, Rufiji District	**Total**	**9,200,000**																									
Sewage facilities for Tanga City	**Tan-L12**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		5,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		15,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Tanga City	**Total**	**24,300,000**																									
Sewage facilities for Pangani Town	**Tan-L13**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Pangani Town	**Total**	**24,300,000**																									
Sewage facilities for Bagamoyo Town	**Tan-L14**																										
Project preparation and mobilisation		100,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		15,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		15,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Bagamoyo Town	**Total**	**34,300,000**																									
Sewage facilities for Kinondoni Municipality	**Tan-L15**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		15,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		15,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Kinondoni Municipality	**Total**	**34,300,000**																									
Sewage facilities for Ilala Municipality	**Tan-L16**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		15,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		15,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Ilala Municipality	**Total**	**34,300,000**																									
Sewage facilities for Temeke Municipality	**Tan-L17**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		15,000,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		15,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Temeke Municipality	**Total**	**34,300,000**																									
Sewage facilities for Kilindoni Town, Mafia District	**Tan-L18**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Kilindoni Town, Mafia District	**Total**	**24,300,000**																									
Sewage facilities for Kilwa Kivinje Town	**Tan-L19**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Kilwa Kivinje Town	**Total**	**24,300,000**																									
Sewage facilities for Kilwa Masoko Town	**Tan-L20**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Kilwa Maksoko Town	**Total**	**24,300,000**																									
Sewage facilities for Lindi Town	**Tan-L21**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Lindi Town	**Total**	**24,300,000**																									
Sewage facilities for Mikindani Town	**Tan-L22**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Mikindani Town	**Total**	**24,300,000**																									
Sewage facilities for Mtwara Town	**Tan-L23**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Sewage collection system		10,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		10,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Sewage facilities for Mtwara Town	**Total**	**24,300,000**																									
Safe toilets facilities for Bwejuu and Jibondo islands, Mafia District	**Tan-L24**																										
Project preparation and mobilisation		100,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		500,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																											
Toilet and sewage system		2,000,000																									
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		2,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Safe toilets facilities for Bwejuu and Jibondo islands, Mafia District	**Total**	**6,800,000**																									
Solid waste collection/processing Tanga City	**Tan-L25**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Tanga City	**Total**	**6,800,000**																									
Solid waste collection/processing Pangani Town	**Tan-L26**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Pangani Town	**Total**	**6,800,000**																									
Solid waste collection/processing Bagamoyo Town	**Tan-L27**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Bagamoyo Town	**Total**	**6,800,000**																									
Solid waste collection/processing Kinondoni Municipality	**Tan-L28**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,500,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,500,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Kinodoni Municipality	**Total**	**7,800,000**																									
Solid waste collection/processing Ilala Municipality	**Tan-L29**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,500,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,500,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Ilala Municipality	**Total**	**7,800,000**																									
Solid waste collection/processing Temeke Municipality	**Tan-L30**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,500,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,500,000																									
Construction: civil, mechanical, contingency.		1,000,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Temeke Municipality	**Total**	**7,800,000**																									
Solid waste collection/processing Kilindoni Town	**Tan-L31**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,500,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,500,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Kilindoni Town	**Total**	**7,800,000**																									
Solid waste collection/processing Kilwa Kivinje	**Tan-L32**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Kilwa Kivinje	**Total**	**6,800,000**																									
Solid waste collection/processing Kilwa Masoko	**Tan-L33**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Kilwa Masoko	**Total**	**6,800,000**																									
Solid waste collection/processing Lindi Town	**Tan-L34**																										
Project preparation and mobilisation		100,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Lindi Town	**Total**	**6,800,000**																									
Solid waste collection/processing Mikindani-Mtwara towns	**Tan-L35**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of solid waste generation and design of specific needs		200,000																									
Project management		500,000																									
Waste processing site acquisition:																											
Infrastructure		1,000,000																									
Equipment		2,000,000																									
Site preparation: ground work, roads		1,000,000																									
Construction: civil, mechanical, contingency.		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Solid waste collection/processing Mikindani-Mtwara towns	**Total**	**6,800,000**																									
Freshwater supply options for Tanga City	**Tan-L36**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of freshwater options		200,000																									
Project management		200,000																									
Trial of rain water harvesting and storage systems		1,000,000																									
Re-habilitate existing water infrastructure		2,000,000																									
Develop freshwater master plan for Pemba		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Freshwater supply options for Tanga City	**Total**	**5,500,000**																									
Freshwater supply options for Lindi Town	**Tan-L37**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of freshwater options		400,000																									
Project management		200,000																									
Trial of rain water harvesting and storage systems		1,000,000																									
Re-habilitate existing water infrastructure		3,000,000																									
Develop freshwater master plan for Lindi		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Freshwater supply options for Lindi Town	**Total**	**6,700,000**																									
Freshwater supply options for Mafia Island Marine Park	**Tan-L38**																										

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Project preparation and mobilisation		100,000																									
Mobilisation/review of freshwater options		400,000																									
Project management		200,000																									
Trial of rain water harvesting and storage and supply systems		3,000,000																									
Re-habilitate existing water infrastructure		2,000,000																									
Develop freshwater master plan for Mafia		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Freshwater supply options for Mafia Island Marine Park	**Total**	**7,700,000**																									
Freshwater supply options for Mnazi Bay Ruvuma Estuary Marine Park	**Tan-L39**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of freshwater options		400,000																									
Project management		200,000																									
Trial of rain water harvesting and storage systems		1,000,000																									
Re-habilitate existing water infrastructure		3,000,000																									
Develop freshwater master plan for Pemba		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
Freshwater supply options for Mnazi Bay Ruvuma Estuary Marine Park	**Total**	**6,700,000**																									
Mainland fisheries sector review by fishery type and management areas	**Tan-L40**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of catch records		100,000																									
Project management		200,000																									
Conduct frame survey (x2)		500,000																									
Collect additional catch/effort data – ground-truthing		200,000																									
Implement improved catch assessment survey (CAS)		400,000																									
Review fisheries management plans (x4)		400,000																									
Review fisheries legislation		200,000																									
Implement Fisheries Management Plans		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		500,000																									
Mainland fisheries sector review by fishery type and management areas	**Total**	**3,600,000**																									
Small pelagic fisheries support for mainland Tanzania	**Tan-L41**																										
Project preparation and mobilisation		100,000																									
Review of small pelagic catch records																											
Project management		200,000																									
Conduct frame survey, focused on small pelagic fishery		Na																									
Collect additional catch/effort data – ground-truthing for small pelagics		Na																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Implement improved catch assessment survey (CAS) for small pelagics		Na																									
Reviewsmall pelagics fisheries management plan		Na																									
Implement small pelagics Fisheries Management Plan		Na																									
Work with fishing units (50)		500,000																									
Conduct feasibility study for sardine cannery (x2)		200,000																									
Assess seasonal changes and model vs climate/oceanographic parameters		300,000																									
Supplies, personnel (hiring and training/capacity building)		500,000																									
Small pelagic fisheries support for mainland Tanzania	**Total**	**1,700,000**																									
Mainland fisheries MCS programme	**Tan-L42**																										
Project preparation and mobilisation		100,000																									
Project management		200,000																									
Communication of revised fisheries legislation to fishers		50,000																									
Launch pilot project of registration and licencing for tuna, small pelagic, octopus and mixed reef fisheries		300,000																									
MBUs and district officers trained and supported		300,000																									
Research mechanisms on sustainability funding		50,000																									
Finalise fisheries patrol unit structure and begin implementation		1,000,000																									
Expand pilot project for registration		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Mainland fisheries MCS programme	**Total**	**5,000,000**																									
Support to MCS to end blast fishing	**Tan-L43**																										
Project preparation and mobilisation		100,000																									
Project management		200,000																									
Finalise anti-blast fishing patrol unit structure and begin implementation		1,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Support to MCS to end blast fishing	**Total**	**3,300,000**																									
Strengthening management of octopus fisheries on mainland	**Tan-L44**																										
Project preparation and mobilisation		100,000																									
Review of small octopus catch records		Na																									
Project management		200,000																									
Conduct frame survey, focused on octopus fishery		Na																									
Collect additional catch/effort data - groundtruthing for octopus		200,000																									
Implement improved catch assessment survey (CAS) for octopus fishrery		Na																									
Review octopus fisheries management plan		Na																									
Implement octopus Fisheries Management Plan		Na																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Work with octopus fishing units (50)		150,000																									
Conduct population genetics study of fished populations		50,000																									
Assess seasonal changes and model vs climate/oceanographic parameters		200,000																									
Equipment, supplies, personnel (hiring and training/capacity building)		100,000																									
Strengthening management of octopus fisheries on mainland	**Total**	**1,000,000**																									
Strengthening seaweed farming on mainland	**Tan-L45**																										
Project preparation and mobilisation		100,000																									
Mobilisation/review of harvest records		50,000																									
Project management		200,000																									
Conduct frame survey		50,000																									
Work with farmers (50) to improve uderstanding of opportuniteis for value-adding		150,000																									
Develop seaaweed farming management plan		Na																									
Implement Seaweed Farming Management Plan		50,000																									
Conduct feasibility study for seaweed processing plant		100,000																									
Study options for alternative species		100,000																									
Assess seasonal changes and model vs climate/oceanographic parameters for each species and areas (Pemba/Unguja)		100,000																									
Equipment, supplies, personnel (hiring and training/capacity building)		100,000																									
Strengthening seaweed farming on mainland	**Total**	**1,000,000**																									
Tuna fisheries support for Mtwara-Lindi regions	**Tan-L46**																										
Project preparation and mobilisation		100,000																									
Review of tuna catch records		Na																									
Project management		200,000																									
Conduct frame survey, focused on tuna fishery																											
Collect additional catch/effort data - groundtruthing for tuna		200,000																									
Implement improved catch assessment survey (CAS) for tuna		Na																									
Develop tuna pelagics fisheries management plan		Na																									
Implement tuna Fisheries Management Plan		Na																									
Work with fishing units (10)		200,000																									
Trial FADs		400,000																									
Trial pole-and-line and dropline fishing		500,000																									
Assess seasonal changes and model vs climate/oceanographic parameters and map hot-spots and share data with IOTC		200,000																									
Conduct population genetics study of fished populations		200,000																									
Host two IOTC working parties		200,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Equipment, supplies, personnel (hiring and training/capacity building)		400,000																									
Tuna fisheries support for Mtwara-Lindi regions	**Total**	**2,600,000**																									
Prawn fisheries support for Rufiji	**Tan-L47**																										
Project preparation and mobilisation		100,000																									
Review of Rufiji prawn fishery catch records		Na																									
Project management		200,000																									
Conduct frame survey, focused on prawn fishery		Na																									
Collect additional catch/effort data - groundtruthing for prawns		Na																									
Implement improved catch assessment survey (CAS) for prawns		Na																									
Review prawns fisheries management plan		Na																									
Implement prawns fisheries Management Plan		Na																									
Work with fishing units (50)		500,000																									
Sample and analyse prawns for agrochemicals		100,000																									
Assess seasonal changes and model vs climate/oceanographuic parameters		300,000																									
Supplies, personnel (hiring and training/capacity building)		500,000																									
Prawn fisheries support for Rufiji	**Total**	**1,700,000**																									
Fish farming research and cage trials at Tanga and Kilwa	**Tan-L48**																										
Project preparation and mobilisation		100,000																									
Project management		200,000																									
Study visit to Mauritius/Singapore		50,000																									
Research into cage site suitability		500,000																									
Survey of suitability of land/sea areas for diverse fish/shellfish aquaculture		100,000																									
Survey of tourism industry requirements		50,000																									
Site for laboratory/hatchery and ponds identified		100,000																									
Facility designed and constructed		2,000,000																									
Research identifying and cultivating potential species		500,000																									
Training in hatchery techniques required for cage culture		100,000																									
Conducting fish cage trials		100,000																									
Research into recruitment of mangrove crab, tilapia farming acceptability and smale-scale feed production		100,000																									
Feasibility study for Pemba Aquaculture Training Centre		100,000																									
Equipment, supplies, personnel (hiring and training/capacity building)		2,000,000																									
Fish farming research and cage trials at Tanga and Kilwa	**Total**	**6,000,000**																									
Beach erosion study for mainland Tanzania	**Tan-L49**																										
Project preparation and mobilisation		200,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Project management		200,000																									
Study erosion/accretion processes		1,500,000																									
Review, develop, implement/enforce laws		200,000																									
Re-habilitate natural erosion soft barriers		3,000,000																									
Develop/review beach management strategy		500,000																									
Local capacity building		1,000,000																									
Beach erosion study for mainland Tanzani	**Total**	**6,600,000**																									
Beach erosion study for Kilwa Kisiwani World Heritage Site	**Tan-L50**																										
Project preparation and mobilisation		200,000																									
Project management		200,000																									
Study erosion/accretion processes		500,000																									
Review, develop, implement/enforce laws		200,000																									
Re-habilitate natural erosion soft barriers		1,000,000																									
Develop/review beach management strategy		500,000																									
Local capacity building		500,000																									
Beach erosion study for Kilwa Kisiwani World Heritage Site	**Total**	**3,100,000**																									
Waste oil treatment facility, Tanga, Dar es Salaam and Mtwara harbours	**Tan-L51**																										
Project preparation and mobilisation		100,000																									
Initial studies, design and engineering,		200,000																									
Project management (includes construction management)		1,000,000																									
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.		Na																									
Infrastructure: Access roads, power supply..		5,000,000																									
Site preparation: Demolishing, ground work, & cables, etc.		1,000,000																									
Construction: civil, mechanical, etc., Contingency.		15,000,000																									
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
Waste oil treatment facility, Tanga, Dar es Salaam and Mtwara harbours	**Total**	**24,300,000**																									
Turtle and nesting protection Pangani	**Tan-L52**																										
Project preparation and mobilisation		10,000																									
Study nesting and turtle movement data (1 year)		20,000																									
Review, develop, implement and enforce turtle nesting protection and awareness programme (3 years)		120,000																									
Develop and review Pangani turtle nesting management strategy (by year 2)		10,000																									
Supplies, personnel (hiring and training/capacity building)		40,000																									
Turtle and nesting protection Pangani	**Total**	**200,000**																									
Urban Planning Bagamoyo	**Tan-L53**																										
Project preparation and mobilisation		50,000																									
Study Bagamoyo land use data (1 year)		100,000																									

	Activity	Budget	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
Actions and Activities	**ID**	**USD**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**					
Develop and review Bagamoyo Town Land Use Plan		100,000																									
Train local district staff to implement and enforce the Bagamoyo Town Land Use Plan		100,000																									
Supplies, personnel (hiring and training/capacity building)		50,000																									
Urban Planning Bagamoyo	**Total**	**400,000**																									
Mangrove rehabilitation Bagamoyo	**Tan-L54**																										
Project preparation and mobilisation		50,000																									
Study and survey mangrove forest data and present condition		100,000																									
Develop and review a Bagamoyo mangrove forest management strategy		100,000																									
Bagamoyo mangrove forest management strategy accepted by local stakeholders		100,000																									
Rehabilitate degraded mangrove forest areas		100,000																									
Implement and enforce mangrove protection and awareness programme		50,000																									
Supplies, personnel (hiring and training/capacity building)		50,000																									
Mangrove rehabilitation Bagamoyo	**Total**	**550,000**																									

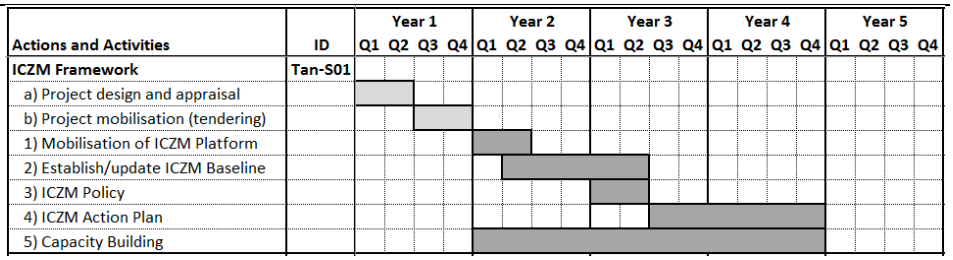
Tan-S01 Integrated Coastal Zone Management Framework

1. Background:	The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of management problems giving rise to increased concern, including ecosystem resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. There are 16 districts in the coastal zone of mainland Tanzania bordering the Indian Ocean. The population in these districts totalled 6,612,827 people in 2012 or around 15% of the country's total population. The combined area of these districts is 57,534 km^2 or 6% of the country's total area of 895,753 km^2. The population density is 150 persons/km^2 which is more than twice the density for the whole country of 50 persons/km^2.
2. Title:	Integrated Coastal Management Framework
3. Action Reference:	Tan-S01
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 76 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 63%, and • 110 out of the 119 identified district level threats to local coastal communities corresponding to 92 %, would benefit from an Integrated Coastal Management Framework providing for better coordination within government and between government and non-government organisations. Traditional sector planning falls short in coping with the complex development situation in the coastal areas, which has contributed to unsustainable land uses, and it is recognised that more integrated approaches are required for development management. Such approaches have matured internationally over the past decades and are increasingly embraced by the international community and considered particularly suited to address the challenges of climate change. It is important that integrated management appreciates the need for linking upstream catchment management arrangements with coastal zone management arrangements to address impacts from inland activities on coastal conditions.
5. Objective:	The objectives of the Integrated Coastal Management Framework Action are • For a coordinated management of the development in the coastal zone of Mainland Tanzania established and operational at central level and in one (to several) districts. • System for updating baseline descriptions of the situation in the coast in place and two structured bi-annual State of the Coast Reports generated overall for mainland Tanzania and for the involved districts in support of development planning

<table>
<tr><td></td><td colspan="2">• Direction for coordinated development management provided through policy development and action planning, aligned with existing policies and development planning.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">• Two consecutive ICZM Baselines for Mainland Tanzania (State of the Coast)
• ICZM Policy
• ICZM Action Plan for Mainland Tanzania
• ICZM Coordination Platform at Central and at District level (one to several)</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Mobilisation of ICZM Platforms
2) Establish/update ICZM baselines
3) ICZM Policy development
4) ICZM Action Plan preparation
5) Capacity Building</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Government of Tanzania is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Non engagement from stakeholders and unwillingness to share experience and information.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Venues at central and local level for regular ICZM Platform meetings
• Secretariats for ICZM Platforms
• Budgets for meetings
• Budgets for technical assistance
• Access to information</td></tr>
<tr><td>Human Resources</td><td>• High level participation in ICZM Coordination Platform at decision making level from Government and non-Government stakeholders.
• Involvement of technical staff in activities under the ICZM Platforms, i.e. ICZM Baseline, ICZM Policy, ICZM Action Plan</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">The coarse budget below does not provide for participation in meetings, meeting premises and secretariat, which is considered a government contribution. Nor does the project provide funds for accessing existing information.

<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and operation of ICZM platforms</td><td>300,000</td></tr>
<tr><td>First and second updated ICZM Baseline</td><td>700,000</td></tr>
<tr><td>ICZM Policy development</td><td>200,000</td></tr>
<tr><td>ICZM Action Plan</td><td>300,000</td></tr>
<tr><td>Capacity building</td><td>400,000</td></tr>
<tr><td>Total</td><td>2,000,000</td></tr>
</table></td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Government of Tanzania (budget, participation, meeting premises, secretariat)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government coastal development stakeholder capable of effectively chairing the coordination efforts:

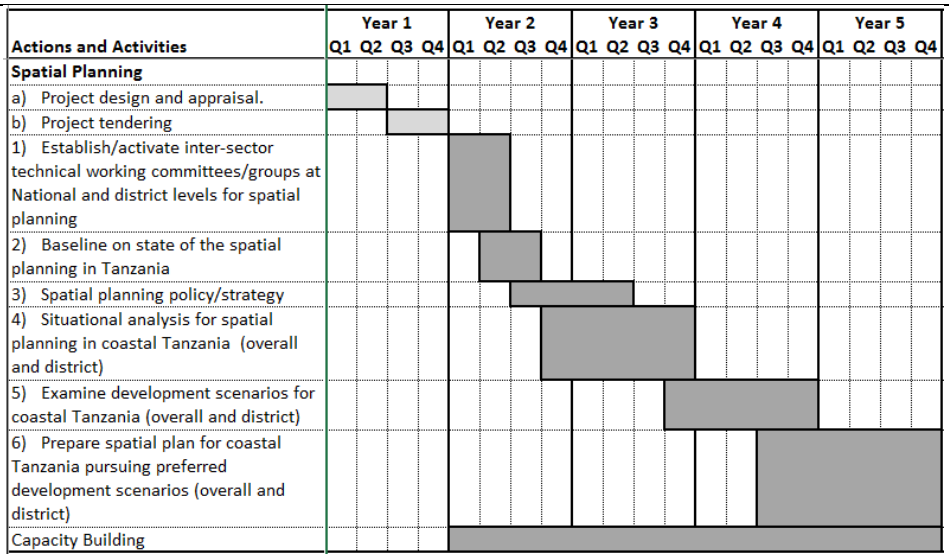
• Vice Presidents Office</td></tr>
</table>

	High-level members of the ICZM Coordination Platform from • Government Ministries
14. Beneficiary from the action:	Key beneficiaries will be senior management and technical staff in government institutions at national and local levels that have management responsibilities related to development in the coastal areas. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal zone management will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	This action is of importance to all other actions in providing: • A forum for systematic cross sector coordination. Of particular relevance and importance would be links to: • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review
17. Performance indicators:	• Legislation empowering the ICZM Coordination Platforms • Minutes of meetings in the ICZM Coordination Platforms • Regular validated Baselines (State of the Coast Reports) • Validated ICZM Policy • Validated ICZM Plan
18. Comments:	Tanzania has a well-established institutional infrastructure with various mandates related to the management of the coastal areas. There is however a pronounced shortage in institutional and human resources and management is therefore falling short in sustainably coping with the development in these areas. Further exacerbating this situation is the traditional sector based management. There is an imposing need for institutional reforms towards proactive coordinated management. This however should be undertaken well aligned to existing institutions.

Tan-S02 Spatial Planning

1. Background:	The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. Physical planning targets the optimization of land uses in support of socio-economic and economic development. It is institutionally embedded with statutory status used for forward land use planning (zoning) and in development control. Physical planning ideally operates in a nested or hierarchical manner at different administrative management levels. Structural planning provides a planning framework spatially expressing policies for overall infrastructure and other sector priorities, regional plans translate these into more detailed infrastructure and land use zoning plans and local area plans provide details for development control. An overall spatial development strategy and plan for the coastal areas of Tanzania are therefore important entry points for mainstreaming climate change adaptation measures into national planning. In the context of sea level rise, vulnerability and risk mapping vis-à-vis erosion and inundation become significant themes in spatial analyses. Mainstreamed spatial plans needs to be accompanied by directions and or guidelines for environmental impact assessments for development in vulnerable areas ensuring that climate change mitigation measures are incorporated in plan and project design and implementation.
2. Title:	Integrated Spatial Planning
3. Action Reference:	Tan-S02
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 77 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 64%, and • 111 out of the 119 identified district level threats to local coastal communities corresponding to 93 %, would benefit from strengthened spatial planning providing for sustainable land use and development control. Support has been provided from the World Bank financed MACEMP to the development of District Land Use Frame Work Plans. These efforts provide an opportunity and foundation to further capacitating the spatial planning system and it is imperative to thoroughly align this action to these activities.
5. Objective:	Spatial planning in Tanzania capacitated and coastal spatial plans updated and used in development control.

<table>
<tr><td>6. Expected outputs:</td><td colspan="2">• State of the spatial planning in Tanzania generally and in the coastal area in particular.
• Spatial development strategy for the coastal areas in line with national structure planning
• Updated regional land use plans for all coastal districts
• Capacitated spatial planning in Tanzania</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Establish/activate inter-sector technical working committees/groups at National and district levels for spatial planning
2) Baseline on state of the spatial planning in Tanzania
3) Spatial planning policy/strategy
4) Situational analysis for spatial planning in coastal Tanzania
5) Examine development scenarios for coastal Tanzania
6) Prepare spatial plan for coastal Tanzania pursuing preferred development scenarios
7) Capacity Building</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Government of Tanzania is committed to engaging in consolidating the spatial planning in Tanzania</td></tr>
<tr><td>9. Risks:</td><td colspan="2">• Reluctance/unwillingness to participate in spatial planning from other government institutions.
• Reluctance/unwillingness to exchange data and information required for spatial analysis.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• GIS capabilities and themes</td></tr>
<tr><td>Human Resources</td><td>• Spatial planners
• IT staff
• Technical staff from other departments
• Technical assistance</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project design and appraisal.</td><td>50,000</td></tr>
<tr><td>Project tendering</td><td>50,000</td></tr>
<tr><td>Establish/activate inter-sector technical working committees /groups at National and district levels for spatial planning</td><td>50,000</td></tr>
<tr><td>Baseline on state of the spatial planning in Tanzania</td><td>100,000</td></tr>
<tr><td>Spatial planning policy/strategy</td><td>100,000</td></tr>
<tr><td>Situational analysis for spatial planning in coastal Tanzania</td><td>1,000,000</td></tr>
<tr><td>Examine development scenarios for coastal Tanzania</td><td>1,000,000</td></tr>
<tr><td>Prepare spatial plan for coastal Tanzania pursuing preferred development scenarios</td><td>1,000,000</td></tr>
<tr><td>Capacity Building</td><td>500,000</td></tr>
<tr><td>Total</td><td>3,850,000</td></tr>
</table></td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Government of Tanzania (budget, participation, meeting premises, secretariat)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">• National Land Use Planning Commission
• Support from other government department at central and district levels</td></tr>
</table>

14. Beneficiary from the action:	Key beneficiaries will be senior management and technical staff in government institutions that have management responsibilities related to development in the coastal areas, in particular spatial planners. Indirect or long term beneficiaries will be the coastal populations at large that through updated district plans will have a spatial framework informing and directing land uses.
15. Schedule:	
16. Links to other actions:	This action is of importance to all other actions in addressing the need for updated quality information in support of: • Decision making and planning, locally and overall • Informed dialogues between stakeholders • Transparency in decision-making Of particular relevance and importance would be links to: • Tan-S01: Integrated Coastal Zone Management Framework • Tan-S03: Shoreline Management • Tan-S04: Information Management • Tan-S06: Awareness Raising
17. Performance indicators:	• State of the land use planning in Tanzania overall • Spatial Plan Strategy for the Coast of Mainland Tanzania • Strategy / policy for spatial planning • Spatial plans • People trained
18. Comments:	The proposed action offers the resources to follow up on earlier initiatives (MACEMP) to reach a comprehensive district plan level for coastal Tanzania and in the process capacitating the Tanzania planning system. The action is well suited to link closely with Tan-S04: Information Management as the spatial analyses rely heavily on a wide range of updated spatial themes. The action can in this sense be considered a strong case for Tan-S04. The action should also be informed by the policies and strategies emerging from Tan-S03: Shoreline Management.

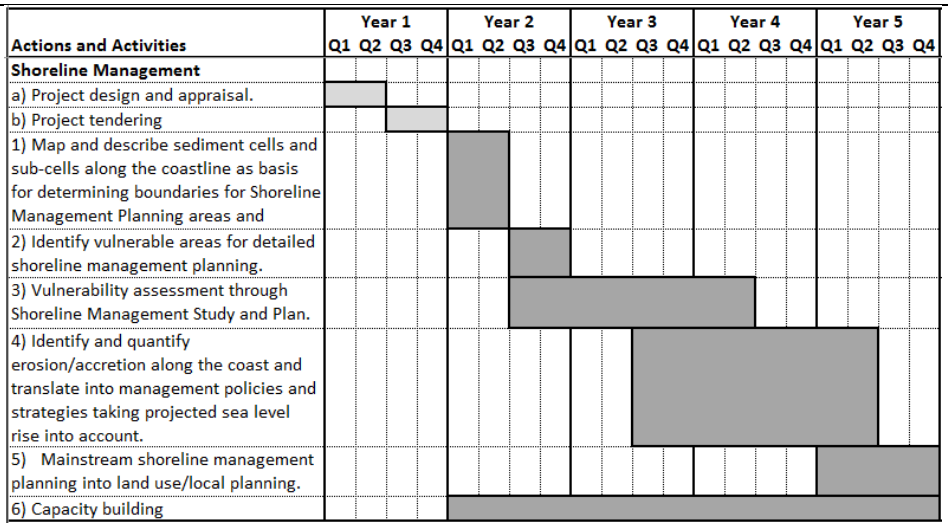
Tan-S03 Shoreline Management

1. Background:	Shoreline erosion and accretion are natural processes shaping coastlines where land meets the sea. Influencing factors include winds, waves, currents, tides, storm and surge conditions, sea level rise, land subsidence and sediment supply from rivers. Anthropogenic interference with underlying processes may significantly alter the rates of accretion or sedimentation. This can be through land use changes in catchments, which may impact on sedimentation processes that play a role in shoreline morphology. It may also alter the hydrological regime which can impact on erosion/accretion patterns along the sea adjacent to estuaries. Interference with the shoreline itself by infrastructure and other development can also influence erosion and accretion long distances along the coast. The dynamic interface between land and sea will move landwards with sea level rise emphasising the demand for specialised studies and planning to develop policies and strategies for land uses along the shoreline to feed into spatial planning. To determine appropriate management responses to erosion requires an analysis of actual and potential shoreline erosion against planned and existing development activities at the coast. It is recommended to undertake a systematic shoreline management planning process in Tanzania to produce appropriate policies and strategies for adaptation to coastal erosion.
2. Title:	Shoreline Management Policy Framework
3. Action Reference:	Tan-S03
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 53 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 44%, and • 87 out of the 119 identified district level threats to local coastal communities corresponding to 33 %, would benefit from shoreline management interventions. A systematic assessment of the shorelines of Tanzania to determine vulnerabilities related to erosion and inundation is a matter of urgency to develop local policies that can be incorporated/mainstreamed into development planning and at the same time consider impacts of climate variability and change.
5. Objective:	Spatial planning informed by policies for shoreline management
6. Expected outputs:	• Shoreline Management Plan for Tanzania • Policies for inclusion and consideration in regional planning • Institutions and staff capacitated within shoreline management
7. Activities:	a) Project design and appraisal. b) Project tendering 1. Map and describe sediment cells and sub-cells along the coastline as basis for determining boundaries for Shoreline Management Planning areas. 2. Identify vulnerable areas for detailed shoreline management planning. 3. Vulnerability assessment through Shoreline Management Study and Plan. 4. Identify and quantify erosion/accretion along the coast and translate into management policies and strategies taking projected sea level rise into account. 5. Mainstream shoreline management planning into land use/local planning. 6. Capacity building

<table>
<tr><td>8. Assumptions:</td><td colspan="2">The Government of Zanzibar is committed to engaging in shoreline management planning</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Reluctance/unwillingness to participate in spatial planning from other government institutions. Reluctance/unwillingness to exchange data and information required for shoreline management. Non adherence to shoreline management policies.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>Satellite imageries, Wave and current data, geomorphology of coast, river discharge statistics, meteorological data, numerical modelling, field</td></tr>
<tr><td>Human Resources</td><td>Access to technical staff within the following fields: numerical modelling, GIS, hydrologist, hydro morphologist, coastal engineering.</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>a) Project design and appraisal</td><td>50,000</td></tr>
<tr><td>b) Project mobilisation</td><td>50,000</td></tr>
<tr><td>1) Map and describe sediment cells and sub-cells along the coastline as basis for determining boundaries for Shoreline Management Planning areas and</td><td>300,000</td></tr>
<tr><td>2) Identify vulnerable areas for detailed shoreline management planning.</td><td>200,000</td></tr>
<tr><td>3.) Vulnerability assessment through Shoreline Management Study and Plan.</td><td>400,000</td></tr>
<tr><td>4) Identify and quantify erosion/accretion along the coast and translate into management policies and strategies taking projected sea level rise into account.</td><td>400,000</td></tr>
<tr><td>5) Mainstream shoreline management planning into land use/local planning.</td><td>200,000</td></tr>
<tr><td>6) Capacity building</td><td>400,000</td></tr>
<tr><td>Total</td><td>2,000,000</td></tr>
</table>
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Government of Tanzania (budget, participation, information, meeting and working premises)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">• Strong Government department capable of effectively coordinating efforts.
• Government departments with stakes or mandates, experience and technical capacity related to shoreline management</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Key beneficiaries will be senior management and technical staff in government institutions at national and local levels that have management responsibilities related to shoreline land uses.

Key beneficiaries will be parties with interest in shoreline development being directed through explicit local policies and plans.

Indirect or long term beneficiaries will be the coastal populations at large that through improved shoreline management will have bettered their opportunities for using the shorelines and benefitting from associated services and getting access to the sea.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	This action is of importance to all other actions in addressing the need for updated quality information in support of: • Decision making and planning along the shorelines • Informed dialogues between stakeholders • Transparency in decision-making Of particular relevance and importance would be links to: • Tan-S01: Integrated Coastal Zone Management Framework • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising
17. Performance indicators:	• Shoreline management plan • Policies and regulations for shoreline uses • Regional spatial plans
18. Comments:	The action is well suited to link closely with Tan-S04: Information Management as the shoreline analyses rely heavily on a wide range of updated spatial themes. The action can in this sense be considered a strong case for Tan-S04. The action should also inform and feed into Tan-S02: Spatial Planning.

Tan-S04 Information Management

1. Background:	The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Spatial data from various sources have been compiled and used to build the Geographical Information System (GIS) supporting the prioritisation study. In this process it has become apparent that although many GIS providers and consumers exist in Tanzania and Zanzibar, a shared and structured directory for accessing geographical information is lacking both in Zanzibar and Tanzania. The lack of such a system leads to inefficient use of data and resources, causes ambiguous use of information sources in management and clouds for a thorough understanding of the current information baseline. At the moment there are no clear responsibilities on marine and coastal data collection. Each institution collects and uses spatial data that is useful for a particular activity, after which the data is summarised in thematic reports and the raw data is kept by the principal investigator or lost when he/she is moved to another department. A systematic archive of spatial data is required to make available historical and recent data on one side and to minimise duplication of efforts in the collection of new information. GIS for the marine environment is now expanding and there are national plans to harmonise institutions in the collection and sharing of data.
2. Title:	Information System as Decision Support for Coastal Development Management
3. Action Reference:	Tan-S04

4. Justification:	Development management decisions in complex settings such as is the case in Tanzania's coastal zone need to be based on a solid information base that enables analyses across many dimensions, including socioeconomic, economic, natural resources, land uses, and climate. Measures to mitigate threats to local communities and ecosystems must be defined based on analyses spanning these dimensions. An overarching and crucial mitigation measure is therefore to ensure that a solid information base is continually available as decision support for planning, that systematic monitoring is carried out to maintain the information base updated and that mechanisms are in place that ensures shared access to information and systematic dissemination of information on the management situation through state reporting. Whereas considerable information may be available from numerous government as well as non-government sources, some is not up-to-date, is incomplete in geographical coverage and is not readily interchanged between information suppliers. Much information is produced as part of studies thus representing one-off focused data acquisition efforts, where data may escape integration into government information management systems. In order to effectively address climate change-related impacts to the shoreline, local communities and natural habitats and species, the integration of accurate and well-coordinated data management is critical.	
5. Objective:	Shared information management system operational and supporting decision making and planning.	
6. Expected outputs:	• Inter sector technical committee or working group charged with supporting information management • Baseline on current information management identifying information sources and information uses • Information needs analysis related to existing mandates • Strategy for coastal data infrastructure development aligned with national data infrastructure initiatives • Shared meta data base for coastal data management • Development and/update of base themes • Consolidated coastal information system	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Establishment of technical committee or working group composed of key users and providers of information for coastal development management 2) Information needs assessment for coastal development management 3) Strategy development 4) Meta database development based on needs for coastal development management and including fields defining means for data exchange 5) Consolidating Data 6) Capacity Building.	
8. Assumptions:	The Government of Tanzania is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.	
9. Risks:	Institutional unwillingness to exchange information. Corruption.	
10. Means of implementation:	Logistics, technical, scientific	• Venues and budgets for meetings in technical working group • Budgets for technical assistance • Sharing of information resources • IT infrastructure elements and software

	Human Resources	• Participation in technical committee and/or working group from key users and providers of information systems • Technical staff from key users and providers of information systems in activities under this action • Technical assistance

11. Budget estimate:

Item	Estimate in USD
a) Project design and appraisal	50,000
b) Project mobilisation	50,000
1) Establishment of technical committee	300,000
2) Information needs assessment	200,000
3) Strategy development	400,000
4) Meta database development	400,000
5) Updating/consolidating shared database	200,000
6) Capacity building	400,000
Total	**2,000,000**

12. Source of funding:

Government of Tanzania (budget, participation, meeting premises, secretariat)
Private IT Sector (participation)
Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:

Strong Government coastal development stakeholder capable of effectively chairing the coordination efforts required for sharing expertise and information resources
Key users and providers of information systems.

14. Beneficiary from the action:

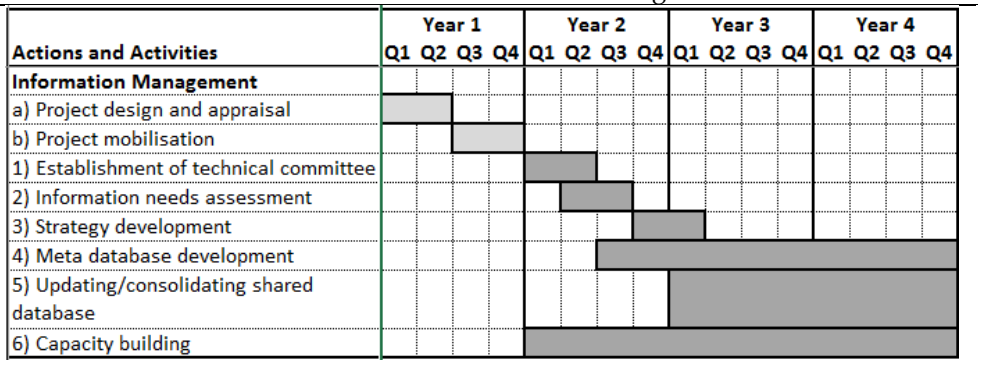
Key beneficiaries will be:

- decision makers related to coastal development to planning
- users and producers of information
- Private sector engaged in information generation
- Schools
- Universities
- Public at large

Key beneficiaries will be senior management and technical staff in government institutions at national and local levels that have management responsibilities related to development in the coastal areas.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal zone management will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:



16. Links to other actions:

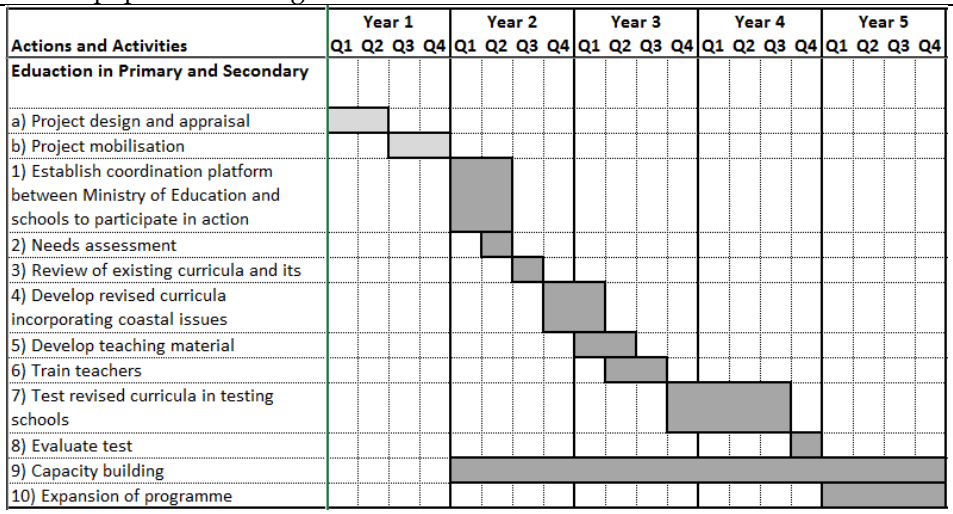
This action is of importance to all other actions in addressing the need for updated quality information in support of:
- Decision making and planning, locally and overall
- Informed dialogues between stakeholders

	• Transparency in decision-making Of particular relevance and importance would be links to: • Tan-S01: Integrated Coastal Zone Management Framework • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-S05: Education in Primary and Secondary Schools • Tan-S06: Awareness Raising
17. Performance indicators:	Updated Metadata from Information management system
18. Comments:	

Tan-S05 Education in Primary and Secondary Schools

1. Background:	The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. For the long term sustainable management and use of coastal areas it is important that the coming generations have an adequate understanding of the issues arising when development imposes pressure on these complex and highly dynamic ecosystems. Hence curricula for primary and secondary education should be reviewed and consolidated to ensure that the development of such an understanding is supported among students.
2. Title:	Primary and Secondary Education
3. Action Reference:	Tan-S05
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 75 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 63%, and • 109 out of the 119 identified district level threats to local coastal communities corresponding to 92 %, would benefit from interaction with education in primary and secondary schools. The working group in these discussion highlighted issues related to • Sustainable fisheries and fisheries ecology. • Importance of environmentally sound industrial production • Sustainable development in areas under high demographic and economic development pressure (coastal areas, urban areas). • Importance of coasts and coastal habitats and resources. • Importance of beaches. • Pollution, environment, health. • Waste minimisation and recycling. • Coastal forest ecology • Coastal forest management; • Hydrologic cycle • Importance of disease vector control. • Complex requirements in coastal areas (high population and economic pressure). • Sustainable development. • Spatial planning to service Population requirements. • Importance of environmentally sound agriculture production.

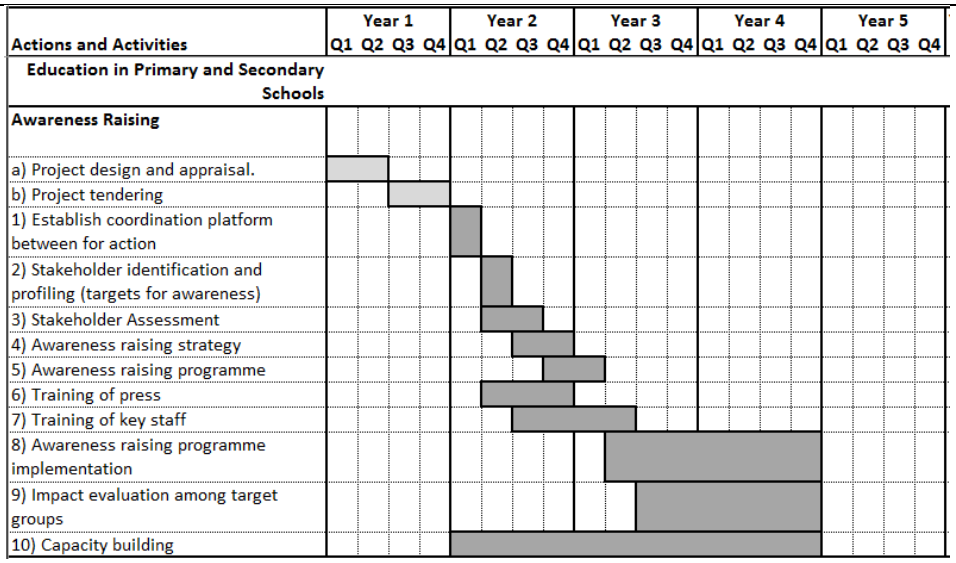
<table>
<tr><td>5. Objective:</td><td colspan="2">Education in primary and secondary schools aligned to develop a holistic understanding among students of the requirement to sustainable manage the coastal zones of Tanzania</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">• Needs assessment for coastal dimension in education
• A review current curricula for primary and secondary education
• Revised curricula incorporating coastal issues
• Teaching material for the revised curricula
• Trained teachers in schools involved in developing and testing
• Evaluation of test
• Programme expansion</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1. Establish coordination platform between Ministry of Education and to participate in action
2. Needs assessment
3. Review of existing curricula and its use
4. Develop revised curricula incorporating coastal issues
5. Develop teaching material
6. Train teachers
7. Test revised curricula in testing schools
8. Evaluate test
9. Capacity building
10. Expansion of programme</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">Government of Tanzania willing to revise curriculum for primary and secondary schools to better incorporate a holistic understanding of coastal development issues</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Schools not willing to engage in developing and testing revised curricula</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to curricula and schools</td></tr>
<tr><td>Human Resources</td><td>• Staff from Ministry of Education
• Staff from schools involved in testing
• Technical assistance</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>a) Project design and appraisal</td><td>50,000</td></tr>
<tr><td>b) Project mobilisation</td><td>50,000</td></tr>
<tr><td>1) Establish coordination platform between Ministry of Education and schools to participate in action</td><td>50,000</td></tr>
<tr><td>2) Needs assessment</td><td>50,000</td></tr>
<tr><td>3) Review of existing curricula and its use</td><td>50,000</td></tr>
<tr><td>4) Develop revised curricula incorporating coastal issues</td><td>100,000</td></tr>
<tr><td>5) Develop teaching material</td><td>200,000</td></tr>
<tr><td>6) Train teachers</td><td>200,000</td></tr>
<tr><td>7) Test revised curricula in testing schools</td><td>400,000</td></tr>
<tr><td>8) Evaluate test</td><td>50,000</td></tr>
<tr><td>9) Capacity building</td><td>500,000</td></tr>
<tr><td>10) Expansion of programme</td><td>100,000</td></tr>
<tr><td>Total</td><td>1,800,000</td></tr>
</table></td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Government of Tanzania (budget, participation, meeting premises, secretariat)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
</table>

13. Responsible for the action:	• Ministry of Education in Tanzania • Schools participating in developing and testing curricula
14. Beneficiary from the action:	• Ministry of Education • Teachers and staff in primary and secondary schools • Students in Primary and Secondary Schools • The population at large.
15. Schedule:	
16. Links to other actions:	Of particular relevance and importance would be links to: • Tan-S04: Information Management • Tan-S06: Awareness Raising
17. Performance indicators:	Revised Curricula covering coastal issues Schools testing revised curricula
18. Comments:	

Tan-S06 Awareness Raising

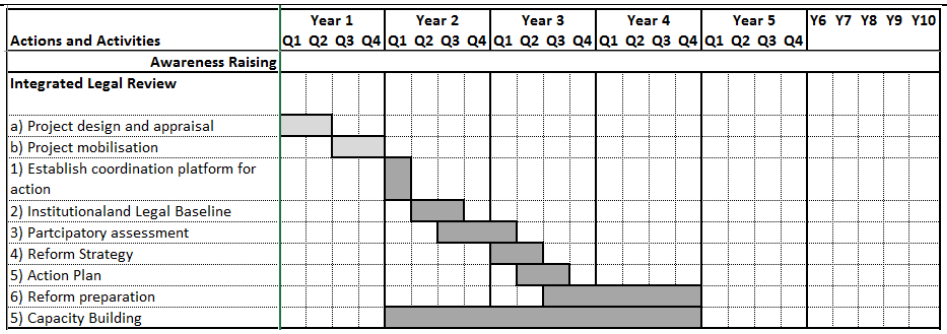
1. Background:	The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. An important factor in unsustainable practises among stakeholders in complex and rapidly developing environments is a lack of understanding of the long term consequences of such practises on communities, environment and ecosystems. A key element in development management is therefore to ensure that all stakeholders groups are continuously informed.
2. Title:	Overall Awareness Raising Strategy and Action
3. Action Reference:	Tan-S06
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 93 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 78%, and • 116 out of the 119 identified district level threats to local coastal communities corresponding to 97 %, calls for increased awareness concerning coastal issues, in particular vulnerability and complexity of coastal systems facing development pressure and impacts from climate change. The working group in these discussion for each threat assessed and outlined target for awareness raising activities and subject areas as comprehensively tabulated in Volume IV of the coastal profile. A comprehensive and very diverse list of targets for awareness raising emerges from these tables while also identifying a wide range of areas where awareness needs to be raised, least of which is issues associated with climate change. There is a requirement to develop and implement a comprehensive awareness raising effort.
5. Objective:	Shared understanding and awareness among coastal stakeholders about issues emerging from development pressure on coastal communities and ecosystems.
6. Expected outputs:	• Stakeholder/Target Group Identification and Profile • Awareness Raising Strategy and Programme • Trained Staff (Public Relation in key departments) • Informed/"trained" press • Awareness Raising Campaigns • Impact evaluations • Aware stakeholders
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Stakeholder identification and profiling (targets for awareness) 2) Stakeholder Assessment

<table>
<tr><td></td><td colspan="2">3) Awareness raising strategy
4) Awareness raising programme
5) Training of press
6) Training of key staff
7) Awareness raising programme implementation
8) Impact evaluation among target groups
9) Capacity building</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">Government of Tanzania committed to empower coastal development stakeholders for more qualified dialogue, involvement and participation in coastal development management</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Political pressure/interference to influence messages or message delivery</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Audio-visuals
• Media
• Press
• Roadshow
• Internet
• ….</td></tr>
<tr><td>Human Resources</td><td>• Public relations staff in government departments Awareness raising specialist
• Communication specialists
• IT Specialist (internet etc)
• Journalists and other media professionals
• NGOs with awareness raisin competences linked to coastal issues
• Technical Assistance</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>a) Project design and appraisal.</td><td>50,000</td></tr>
<tr><td>b) Project tendering</td><td>50,000</td></tr>
<tr><td>1) Establish coordination platform between for action</td><td>50,000</td></tr>
<tr><td>2) Stakeholder identification and profiling (targets for awareness)</td><td>50,000</td></tr>
<tr><td>3) Stakeholder Assessment</td><td>50,000</td></tr>
<tr><td>4) Awareness raising strategy</td><td>50,000</td></tr>
<tr><td>5) Awareness raising programme</td><td>50,000</td></tr>
<tr><td>6) Training of press</td><td>100,000</td></tr>
<tr><td>7) Training of key staff</td><td>300,000</td></tr>
<tr><td>8) Awareness raising programme implementation</td><td>1,000,000</td></tr>
<tr><td>9) Impact evaluation among target groups</td><td>200,000</td></tr>
<tr><td>10) Capacity building</td><td>500,000</td></tr>
<tr><td>Total</td><td>2,450,000</td></tr>
</table></td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Government of Tanzania (budget, participation, meeting premises, secretariat)
• Press and media (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Government departments with stakes or mandates, experience and technical capacity related to coastal development planning and management</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">• Government and non-government organisations increasing competence in addressing coastal development issues
• Government organisations engaging in dialogues with a more qualified public and private stakeholders
• Public at large empowered to getting more involved and participate in coastal management activities</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	This action is of importance to all other actions in providing: • More aware stakeholders of the issues in coastal development management Of particular relevance and importance would be links to: • Tan-S04: Information Management • Tan-S05: Education in Primary and Secondary Schools Links to all actions desirable as these may be suppliers of relevant case and experience material in support of awareness raising
17. Performance indicators:	• Awareness raising material • Press material • Records of campaigns • Impact surveys • Trained staff …
18. Comments:	

Tan-S07 Integrated Legal Review

1. Background:	The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.
2. Title:	Integrated Review of Legal Framework for Coastal Development Management
3. Action Reference:	Tan-S07
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 55 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 46%, and • 37 out of the 119 identified district level threats to local coastal communities corresponding to 31 %, called for review of legal provisions. The work group further found that the mitigation of • 91 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 76%, and • 117 out of the 119 identified district level threats to local coastal communities corresponding to 98 %, required intervention related to enforcement.
5. Objective:	• Harmonised legal framework for sustainable coastal management • Strengthened enforcement of laws and regulations
6. Expected outputs:	• Institutional and legal baseline • Reform strategy and action plan • Draft revision to legal integrated legal framework
7. Activities:	a) Project design and appraisal b) Project mobilisation 1) Establish coordination platform for action 2) Institutional and Legal Baseline 3) Participatory assessment 4) Reform Strategy 5) Action Plan 6) Reform preparation 7) Capacity Building
8. Assumptions:	The Government of Tanzania is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.
9. Risks:	Institutional resistance to legal reform

<table>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Venues and budgets for regular coordination meetings
• Budgets for technical assistance
• Access to legal texts</td></tr>
<tr><td>Human Resources</td><td>• Legal specialists
• Legal and enforcement staff from relevant departments
• Private legal sector
• Technical assistance</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>a) Project design and appraisal</td><td>50,000</td></tr>
<tr><td>b) Project mobilisation</td><td>50,000</td></tr>
<tr><td>1) Establish coordination platform for action</td><td>50,000</td></tr>
<tr><td>2) Institutional and Legal Baseline</td><td>100,000</td></tr>
<tr><td>3) Participatory assessment</td><td>200,000</td></tr>
<tr><td>4) Reform Strategy</td><td>50,000</td></tr>
<tr><td>5) Action Plan</td><td>50,000</td></tr>
<tr><td>6) Reform preparation</td><td>500,000</td></tr>
<tr><td>7) Capacity Building</td><td>200,000</td></tr>
<tr><td>Total</td><td>1,250,000</td></tr>
</table>
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Government of Tanzania (budget, participation, meeting premises, secretariat)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">• Law Reform Commission of Tanzania
• Legal officers government institution with mandates and legal instruments related to coastal development management and control
• Private Legal Sector and Legal NGOs</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Government institutions gaining access to harmonised legal framework as basis for more effective enforcement</td></tr>
<tr><td>15. Schedule:</td><td colspan="2"> 
</td></tr>
<tr><td>16. Links to other actions:</td><td colspan="2">• Tan-S01: Integrated Coastal Zone Management Framework
• Tan-S04: Information Management
• Tan-S06: Awareness Raising</td></tr>
<tr><td>17. Performance indicators:</td><td colspan="2">• Minutes of meeting in coordination platform for action
• Proceedings from workshops and validation meetings
• Institutional and legal baseline
• Reform strategy and action plan</td></tr>
<tr><td>18. Comments:</td><td colspan="2"></td></tr>
</table>

Tan-S08 Support for the NEMC

1. Background:	The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. The latter is particularly relevant with respect to developers and vested interested from diverse parties (including local businesses, institutions, lenders and financial institutions, and development partners). The National Environment Management Council (NEMC) is the national institution responsible for overseeing the integrity of Tanzanian's environment for sustainable development. The principle piece of legislation that embraces most development activities in the coastal zone is the Environmental Management Act (EMA) 2004. This Act provides a legal and institutional framework for the sustainable management of the environment. All project activities, especially oil and gas exploration, mining projects, ports and harbours must be planned and comply with its relevant provisions, particularly the need to undertake an environmental and social impact assessment (ESIA) depending on the type of activity and scale. The implementation of the EMA 2004 is the responsibility of the NEMC, under the Division of Environment. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.
2. Title:	Support for the National Environment Management Council (NEMC)
3. Action Reference:	Tan-S08
4. Justification:	The working group in Dar es Salaam found that in Mainland Tanzania the threats to livelihoods and the environment from impacts from hydrocarbon development, from failure of exploration companies to adhere to environmental and socio-economic safeguards, partly due to weakness in the oversight provided by the NEMC is responsible for issuing licences and monitoring the operations that have been subjected to EIAs, were ranked as very important. Similarly, small-scale mining projects involving reclamation of land requires environmental impact assessments, the NEMC are supposed to approve a project, however, some farmers begin construction prior to receiving permission. The lack of capacity at the NEMC to follow up, enforce and resolve development issues is seen as the main weakness which would significantly benefit from support, training, and expansion in staff, facilities and expertise. The working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 77 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 64%, and • 111 out of the 119 identified district level threats to local coastal communities corresponding to 93 %, would benefit from an Integrated Coastal Management Framework providing for better coordination within government and between government and non-government organisations. In addition, as seen above, • 53 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 44%, and • 87 out of the 119 identified district level threats to local coastal communities corresponding to 33 %, would benefit from shoreline management interventions. Furthermore, at the district level,

	• 91 out of the 120 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 76%, and • 117 out of the 119 identified district level threats to local coastal communities corresponding to 98 %, required intervention related to enforcement. The working group in these discussion recognised the need to support and help strengthen the capacity of the national regulator of development, the NEMC, whose mandate addresses the above issues through review and enforcement of findings of environmental and social impact assessments.	
5. Objective:	Capacity of the national regulator of development (NEMC) in Tanzania strengthened, particularly with respect to coastal developments such as oil and gas, mining, salt productions and port development.	
6. Expected outputs:	• NEMC staff capacitated within management of coastal development projects, particularly oil and gas exploration and development, ports and harbours and coastal mining. • Regional offices of NEMC strengthened. • NEMC institution strengthened to enable effective management of coastal development projects. • Development planning in the coastal areas in line with national structure planning and able to withstand vested interest pressures	
7. Activities:	a) Project design and appraisal b) Project mobilisation 1) Establish coordination platform for action 2) Stakeholder identification and profiling (targets for awareness) 3) Awareness raising strategy 4) Awareness raising programme 5) Training of key staff and relevant stakeholder on target areas 6) Impact evaluation among target groups 7) Capacity building	
8. Assumptions:	The Government of Tanzania is committed to engaging in reform processes towards more coordinated and integrated coastal zone management, which includes strengthening of the principle national regulator (NEMC)	
9. Risks:	Institutional resistance to reform in capacity building	
10. Means of implementation:	Logistics, technical, scientific	• Venues and budgets for regular coordination meetings, at NEMC HQ (in Dar es Salaam) and regional (coastal) offices • Budgets for technical assistance • Access to information
	Human Resources	• High level participation at decision making level from Government and non-Government stakeholders. • Legal and enforcement staff from relevant departments • Involvement of technical staff on activities of special focus

11. Budget estimate:

Item	Estimate in USD
a) Project design and appraisal	50,000
b) Project mobilisation	50,000
1) Establish coordination platform for action	50,000
2) Stakeholder identification/profiling (targets for awareness)	100,000
3) Awareness raising strategy	200,000
4) Awareness raising programme	50,000
5) Training of key staff and relevant stakeholder on target areas	200,000
6) Impact evaluation among target groups	500,000
7) Capacity Building	500,000
Total	1,700,000

12. Source of funding:

- Government of Tanzania (budget, participation, meeting premises, secretariat)
- Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

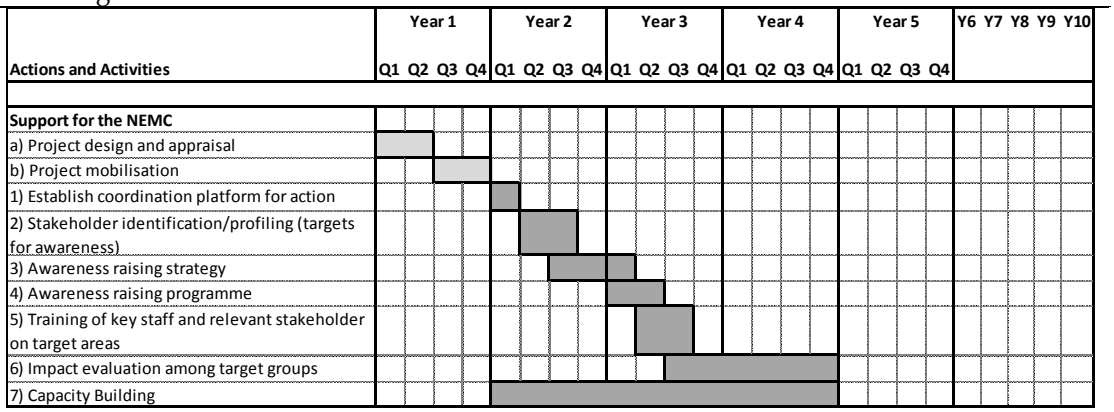
13. Responsible for the action:

Government departments with stakes or mandates, experience and technical capacity related to coastal development planning and management

14. Beneficiary from the action:

- NEMC increasing competence in addressing coastal development issues
- Government organisations engaging in dialogues with a more qualified public and private stakeholders
- Public at large empowered to getting more involved and participate in coastal management activities

15. Schedule:



16. Links to other actions:

This action is of importance to all other actions in providing:

- More aware high level management of coastal development

Of particular relevance and importance would be links to:

- Tan-S01: Integrated Coastal Zone Management Framework
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S09: Support for Tourism Management Planning

17. Performance indicators:

- Minutes of meeting in coordination platform for action
- Proceedings from training and evaluations among target groups

18. Comments:

Tan-S09 Support for Tourism Management Planning

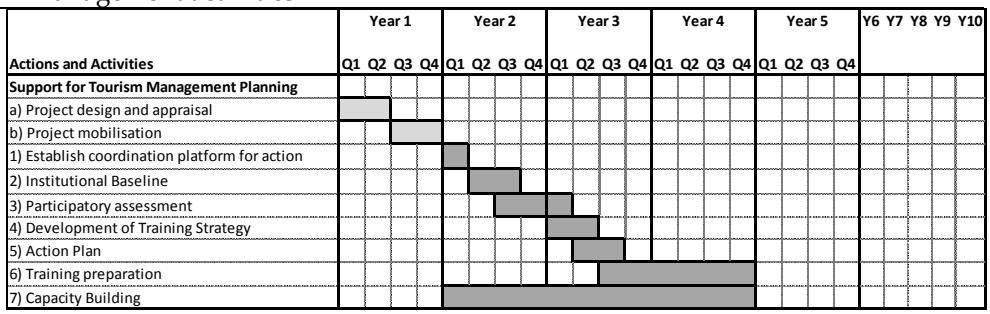
1. Background:	Coastal tourism shows a promising future as evidenced by the number, variety and diversity of accommodation facilities that have been constructed or are planned. Recommendations in the Tourism Master Plan (URT, 2002) relevant to the coast include development of a strong Southern Circuit comprising the coastal areas beach resort tourism including Mafia, offshore islands, Bagamoyo, Saadani Game Reserve and Kilwa. Under the Ministry of Natural Resources and Tourism, the Division of Tourism aims to implement the National Tourism Policy as well as regulatory functions. The main objective of the Policy is to assist efforts to promote the economy and livelihoods, essentially poverty alleviation, by encouraging development of sustainable and quality tourism that is culturally and socially acceptable, ecologically friendly, environmentally sustainable and economically viable. The Division is divided into three sections, one of which is Tourism Development, which deals with sectoral policy, national and international cooperation, identification of tourist attraction and diversification of tourism activities, developing and promoting domestic tourism. The coastal zone in Mainland Tanzania is under development pressure from population growth and economic activities and the area is experiencing a range of management problems giving rise to increased concern, including ecosystem encroachment, pollution, and salinization of soils, estuaries and aquifers, degradation of resources, shoreline erosion and conflicts of interest among stakeholders. Climate change will further aggravate this situation due to sea level rise and more frequent extreme weather. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.
2. Title:	Support for Tourism Management Planning
3. Action Reference:	Tan-S09
4. Justification:	There are concerns that the coastal districts of Mafia, Pangani and Kilwa require more urgent management intervention within the tourism sector to safeguard the main attractions at these locations. For example, inadequate sewage infrastructure and waste management resulting in pollution of the coastal zone, from some developments illegally dumping waste and litter, and, reduction in iconic marine life with illegal killing of whale sharks, dolphins, dugongs, turtles and other exotic marine animals that are tourist attractions degrading the value of the experience and creating a poor image of Tanzania as an eco-friendly destination were ranked as very important and important problems respectively. In addition, the working group in Dar es Salaam found that in Mainland Tanzania the mitigation of • 32 out of the 197 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 16%, called for capacity building. Land-use management was the second highest intervention identified, reflected in 28 of the 197 identified threats. To achieve an effective and speedy action, there is a requirement to develop and implement a comprehensive capacity building effort within the tourism

	management sector, specifically addressing the coastal sites of Mafia, Kilwa and Pangani.
5. Objective:	Capacity of the Tourism Development section of the Division of Tourism in Tanzania strengthened, particularly with respect to coastal developments in Pangani, Mafia and Kilwa.
6. Expected outputs:	• Tourism Development section staff capacitated within management of coastal development projects, particularly in the identified districts. • Dar es Salaam offices of the Division of Tourism strengthened. • Tourism Development section strengthened to enable effective management of coastal development projects. • Development planning in the coastal areas in line with national structure planning and able to withstand vested interest pressures • Sensitive natural and cultural features of the three focus districts protected and utilised sustainably
7. Activities:	a) Project design and appraisal b) Project mobilisation 1) Establish coordination platform for action 2) Stakeholder identification and profiling (targets for awareness) 3) Awareness raising strategy 4) Awareness raising programme 5) Training of key staff and relevant stakeholder on target areas 6) Impact evaluation among target groups 7) Capacity building
8. Assumptions:	The Government of Tanzania is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.
9. Risks:	Institutional resistance to capacity reform related to sensitive cultural and natural features of the coastal zone
10. Means of implementation:	Logistics, technical, scientific: • Venues and budgets for regular coordination meetings, at Division of Tourism HQ (in Dar es Salaam) • Budgets for technical assistance • Access to information
	Human Resources: • High level participation at decision making level from Government and non-Government stakeholders • Legal and enforcement staff from relevant departments • Involvement of technical staff on activities of special focus

11. Budget estimate:

Item	Estimate in USD
a) Project design and appraisal	50,000
b) Project mobilisation	50,000
1) Establish coordination platform for action	50,000
2) Institutional Baseline	100,000
3) Participatory assessment	200,000
4) Development of Training Strategy	50,000
5) Action Plan	50,000
6) Training preparation	500,000
7) Capacity Building	200,000
Total	1,250,000

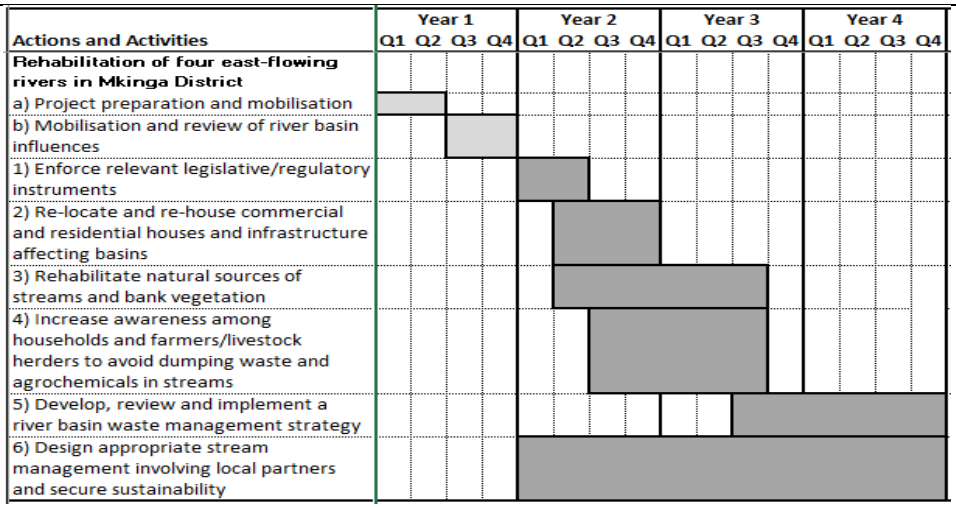
12. Source of funding:	• Government of Tanzania (budget, participation, meeting premises, secretariat) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:	Government departments with stakes or mandates, experience and technical capacity related to coastal development planning and management.
14. Beneficiary from the action:	• Division of Tourism increasing competence in addressing coastal development issues of the three focus districts • Government organisations engaging in dialogues with a more qualified public and private stakeholders in the tourism sectors of the three focus districts • Public at large empowered to getting more involved and participate in coastal management activities
15. Schedule:	
16. Links to other actions:	• Tan-S01: Integrated Coastal Zone Management Framework • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S08: Support for the NEMC
17. Performance indicators:	• Minutes of meeting in coordination platform for action • Proceedings from training and evaluations among target groups • Institutional baseline • Reform strategy and action plan
18. Comments:	

Tan-L01: Rehabilitation and clean-up of four east-flowing rivers in Mkinga District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Nutrient and chemical pollution discharged through these rivers into the coastal environment on the western shores of the Pemba Channel is well documented, visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watersheds. There are four major river basins plus several much smaller streams, either perennial or semi-seasonal, that extend from the northern border of Kwale Bay (the effective border between Mkinga and Tanga Municipality) to the border with Kenya. Visible from the 1:50,000 topo maps, the larger basins are: • Ngole River, with various sources including the longest, Msimbazi River, and the Mkaka and Pangarowe rivers, draining from 20-25 km inland to the west and northwest, and discharging through the Mayumboni mangrove forest, close to Kwale Island. • Kombe River, extending for approximately 25 km from the northwest, before emptying at Doda mangrove forested estuary. • Ndoyo River, with a source some 20 km to the north, emptying into the same Doda mangrove forested estuary as the Kombe River. • Mwambalazi River, draining Changanyiko area for over 30 km, discharging at Vibambani, as the major contributor of freshwater into the mangrove estuary inshore of the Boma Peninsula.
2. Title:	Rehabilitation and clean-up of four east-flowing streams in Mkinga District
3. Action Reference:	Tan-L01
4. Justification:	Beach pollution and marine pollution were identified as severity level 3 and 2 respectively, for Mkinga District, with beach pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Decline in fisheries yields, regarded as a threat of level 4, are also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The east flowing streams of Mkinga are some of the largest conduits for liquid and solid waste, chemicals and sediment to the north Tanga Region coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations and neighbouring Coelacanth Marine Park to the south. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range.

<table>
<tr><td>5. Objective:</td><td colspan="2">By 2025 waters from these four rivers devoid of pollution with riverine and estuarine biodiversity restored.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">The objectives of the Action to rehabilitate four east-flowing streams in Mkinga District are:
• Clean and safe water in the streams.
• Greater ability of the river banks to absorb small flooding events.
• Reduced solid and liquid wastes discharged to sea.
• Decreased volume of wastes into the streams.
• Reduced wastes washed up along the coast.
• Stream sources rehabilitated and protected.
• Local NGOs capable of managing stream environment.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Investigate waste production pathways.
6) Develop, review and implement a waste management strategy.
7) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>3,000,000</td></tr>
<tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>8,000,000</td></tr>
<tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr>
</table></td></tr>
</table>

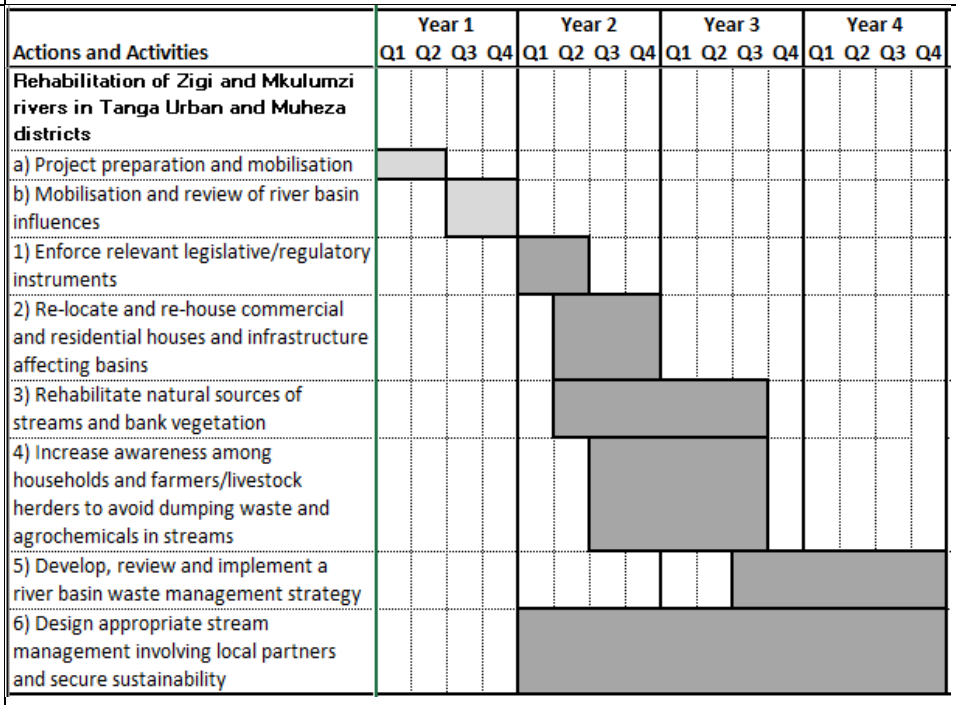
	<table><tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr><tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr><tr><td>Total</td><td>13,500,000</td></tr></table> The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Pangani River Basin Authority • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (tens of thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions:

	• Tan-L02: Rehabilitation and clean-up of Sigi and Mkulumzi river basins in Tanga Urban and Muheza districts • Tan-L12: Sewage collection and treatment facilities for Tanga City • Tan-L25: Solid waste collection and processing facility for Tanga City
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events
18. Comments:	Relevant initiatives are the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues.

Tan-L02: Rehabilitation and clean-up of Sigi and Mkulumzi rivers through Tanga Urban and Muheza Districts

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. There are two major river basins plus several much smaller streams, either perennial or semi-seasonal, that discharge in the vicinity of Tanga Town, within Tanga Urban District. These are: • Sigi River, arising in the Amani Nature Reserve in the Eastern Usambara Mountains and Manga Forest Reserve area, for almost 100 km, passing sisal plantations, the Gombero Forest Reserve, the Mabayani Reservoir, and various waterfall stretches, before emptying at Amboni mangrove creek in the western part of Tanga Bay. • Mkulumzi River, draining from the eastern Usumbara Mouhtains, for over 40 km to the west passing through sisal plantation areas, close to Muheza town, with numerous long tributaries, before emptying into Udofu Creek, a mangrove forested estuary in the western part of Tanga Bay. Nutrient and chemical pollution discharged through these rivers into the coastal environment on the western shores of the Pemba Channel is well-documented (e.g. Yanda and Munishi, 2007), visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watersheds.
2. Title:	Rehabilitation and clean-up of Sigi and Mkulumzi rivers through Tanga Urban and Muheza Districts
3. Action Reference:	Tan-L02
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Tanga Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Decline in fisheries yields, regarded as a threat of level 5 is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The two east flowing streams that drain northern Muheza are some of the largest conduits for liquid and solid waste, chemicals and sediment to the north Tanga Region coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations and neighbouring Coelacanth Marine Park to the south. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range.

<table>
<tr><td>5. Objective:</td><td colspan="2">By 2025 waters from these two rivers devoid of pollution with riverine and estuarine biodiversity restored.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">The objectives of the Action to rehabilitate Sigi and Mkulumzi rivers in Tanga Urban and Muheza districts are:
• Clean and safe water in the streams.
• Greater ability of the river banks to absorb small flooding events.
• Reduced solid and liquid wastes discharged to sea.
• Decreased volume of wastes into the streams.
• Reduced wastes washed up along the coast.
• Stream sources rehabilitated and protected.
• Local NGOs capable of managing stream environment.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Investigate waste production pathways.
6) Develop, review and implement a waste management strategy.
7) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>3,000,000</td></tr>
<tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>8,000,000</td></tr>
<tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr>
</table></td></tr>
</table>

	Develop, review and implement river basin waste management strategy: 300,000 Design appropriate stream management involving local partners and secure sustainability: 1,000,000 Total: 13,500,000 The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Pangani River Basin Authority • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (tens of thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management

	• Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions: • Tan-L01: Rehabilitation and clean-up of four east-flowing streams in Mkinga District • Tan-L12: Sewage collection and treatment facilities for Tanga City • Tan-L25: Solid waste collection and processing facility for Tanga City
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events • ..
18. Comments:	Relevant initiatives are the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness. Also, the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues. References: Yanda P.Z. and Munishi, P.K.T. 2007. Hydrologic and land use/cover change analysis for the Ruvu River (Uluguru) and Sigi River (East Usambara) watersheds. For WWF/CARE Dar es Salaam, Tanzania. 80 pp.

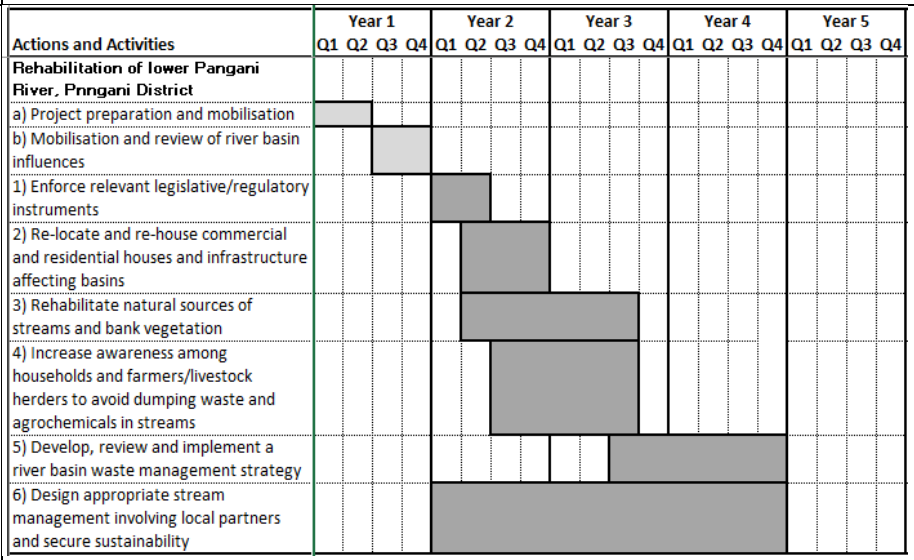
Tan-L03: Rehabilitation and clean-up of lower Pangani River, Muheza and Pangani districts

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Pangani River is over 500 km long, with a basin that begins on the slopes of Kilimanjaro Mountain, covering 43,000 km^2. Several tributaries and smaller streams, either perennial or seasonal, feed the main river - many passing through sisal and other plantation areas. There are five main sub-basins, each with distinctive hydrological characteristics. The lower Pangani River (including the rejuvenated river section and estuary portion) are the focus of this action, all within the Tanga Region, mainly Muheza and Pangani districts. Sources of pollution include agrochemicals, uncontrolled solid wastes, and sewage that enter the Pangani River at various locations. Nutrient and chemical pollution discharged through these rivers into the coastal environment on the western shores of the Pemba Channel is well-documented, visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watersheds. However, the Pangani estuary is also well-document as suffering from severe erosion, believed to be due to the hydroelectric installations in the Tanga Region portion of the river that are preventing sediment transport downstream and from river water abstraction for agriculture, with resulting reduced flow, both needed to supply sediments to the now retreating river mouth.
2. Title:	Rehabilitation and clean-up of lower Pangani River, Pangani District
3. Action Reference:	Tan-L03
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4 and 2 respectively, for Pangani District, with pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Decline in fisheries yields, regarded as a threat of level 4, are also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The Pangani River is the largest conduit in the region for liquid and solid waste, chemicals and sediment to the Tanga Region coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations and neighbouring Coelacanth Marine Park to the south. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range, and moreso where the Government has a focus on commercial agriculture such as in Wami-Ruvu catchments.

5. Objective:	By 2025 waters from the Pangani River devoid of pollution with riverine and estuarine biodiversity and sediment input restored.	
6. Expected outputs:	The objectives of the Action to rehabilitate the Tanga Region portion of the Pangani River are: • Clean and safe water in the main river and tributaries in the Tanga Region. • Greater ability of the river banks to absorb small flooding events. • Reduced solid and liquid wastes discharged to sea. • Decreased volume of wastes into the main river. • Reduced wastes washed up along the coast. • Stream sources rehabilitated and protected. • Local NGOs capable of managing stream environment.	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Develop, review and implement stream management strategy. 2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment for the lower and estuarine portions of the Pangani Basin (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances). 3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes). 4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers. 5) Develop, review and implement a waste management strategy. 6) Design appropriate river management.	
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.	
9. Risks:	Local residents and businesses may object and block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Hydraulic modelling • Access to information • Green-green infrastructure • IWRM planning • …
	Human Resources	• Civil and water engineers • Modellers • Physical Planners • Pollution chemists, freshwater ecologists and botanists • Socio-economists and resettlement specialists • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Mobilisation and review of river basin influences	200,000
Enforce relevant legislative/regulatory instruments	300,000
Re-locate and re-house commercial and residential houses and infrastructure affecting basins	3,000,000
Rehabilitate natural sources of streams and bank vegetation	8,000,000
Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams	600,000

	<table><tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr><tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr><tr><td>Total</td><td>13,500,000</td></tr></table> The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Pangani River Basin Authority • Pangani River Basin Management Project and Pangani Basin Water Board • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (tens of thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-S04: Information Management • Tan-S06: Awareness Raising

	• Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions: • Tan-L01: Rehabilitation and clean-up of four east-flowing streams in Mkinga District • Tan-L02: Rehabilitation and clean-up of Zigi and Mkulumizi rivers in tanga and Muheza districts • Tan-L12: Sewage collection and treatment facility Tanga City • Tan-L13: Sewage collection and treatment facility Pangani Town • Tan-L25: Urban solid waste collection and processing facility Tanga City • Tan-L26: Urban solid waste collection and processing facility Pangani Town
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events • ..
18. Comments:	Over the recent twenty years there have been a number of initiatives responding to water shortages, river water quality, fisheries, agricultural needs and hydroelectric uses of the Pangani River Basin. Impacts of climate change have also been more recently investigated. This Action needs to be aligned with on-going initiatives related to river flows in the Pangani Basin, for example the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues, but focus more especially on the portions of river and catchments located in the Tanga Region with particular emphasis on the quality of the final discharges into the coastal zone.

Tan-L04: Safeguarding of the Wami River, Bagamoyo

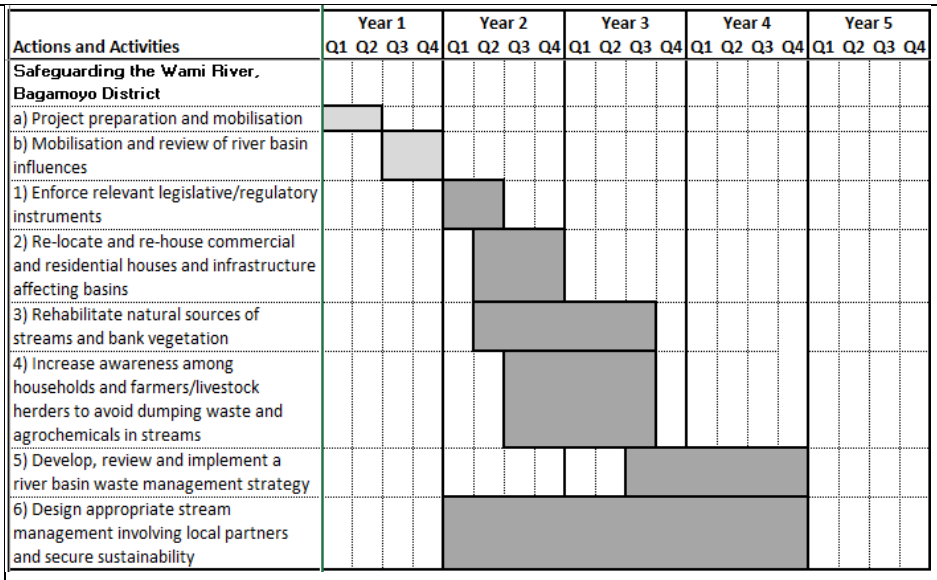
1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Wami River basin is the largest that passes through Bagamoyo District, with tributaries such as the Kangasungwa River beginning in Kondoa District (north of Dodoma), passing through Kilosa District (west of Morogoro) where it is called the Mkondoa River before becoming the Wami River, in all, extending some 350 km before discharging on the coast in the middle of the Saadani National Park. Nutrient and chemical pollution associated with the Wami River is not well-documented, and likely to be very little at present, though the expected growth in population and associated land and river water usage are certain to increase pressure on the river and its catchment.

2. Title:	Safeguarding of the Wami River, Bagamoyo District	
3. Action Reference:	Tan-L04	
4. Justification:	Beach pollution was identified as severity level 3, for Bagamoyo District, with pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were also contributing to marine pollution. While there is no documented evidence of agrochemical or solid wastes discharged from the Wami River, there is strong likelihood that over the coming years, with increasing pressure on the land that the Wami River basin drains that agrochemical and solid wastes will increasingly become disposed of or leach into the tributaries of the Wami, eventually reaching the coast at Saadani National Park. Furthermore, any marine pollution from Bagamoyo District will be transported northwards on the prevailing coastal current where it will negatively affect the Tanga Region coastline, in particular the newly established Coelacanth Marine Park and the sensitive coral reef and other habitat therein. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range, and moreso where the Government has a focus on commercial agriculture such as in Wami-Ruvu catchments.	
5. Objective:	By 2025 waters from the Wami River devoid of pollution with riverine and estuarine biodiversity intact.	
6. Expected outputs:	The objectives of the Action to safeguard the Wami River are: • Maintain the river and stream waters clean and safe. • Maintain the ability of the river banks to absorb small flooding events. • Keep solid and liquid wastes volumes from being discharged to sea. • Keep the volume of wastes dumped into the streams at a minimum. • Reduced wastes washed up along the coast. • Stream sources protected. • Local NGOs capable of managing river basin environment.	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Develop, review and implement stream management strategy. 2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances). 3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes). 4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers. 5) Develop, review and implement a waste management strategy. 6) Design appropriate stream management.	
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.	
9. Risks:	Local residents and businesses may object and block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance

<table>
<tr><td></td><td></td><td>• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td></td><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>1,000,000</td></tr>
<tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>4,000,000</td></tr>
<tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr>
<tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr>
<tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>7,500,000</td></tr>
</table>

The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Local Government coastal development stakeholder capable of effectively coordinating efforts:
• Wami-Ruvu River Basin Authority
• Contractors
• NGOs
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (over three hundred thousand) plus Saadani National Park foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters.
Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following local actions:

- Tan-L05: Rehabilitation and clean-up of Ruvu River Bagamoyo Districts
- Tan-L27: Urban solid waste collection and processing Bagamoyo Town

17. Performance indicators:

- Water quality (chemistry, BOD, agrochemicals, etc.)
- Volumes and types of solid wastes on associated beaches
- Records of inundation events
- ..

18. Comments:

Note: There are a number of initiatives responding to Ruvu and Wami RiverBasins, especially with respect to water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated. This Action needs to be aligned with on-going initiatives related to river flows in the wider river basins, for example the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues, but focused more especially on the Wami River and catchment, with particular emphasis on the quality of the final discharges into the coastal zone.

References:

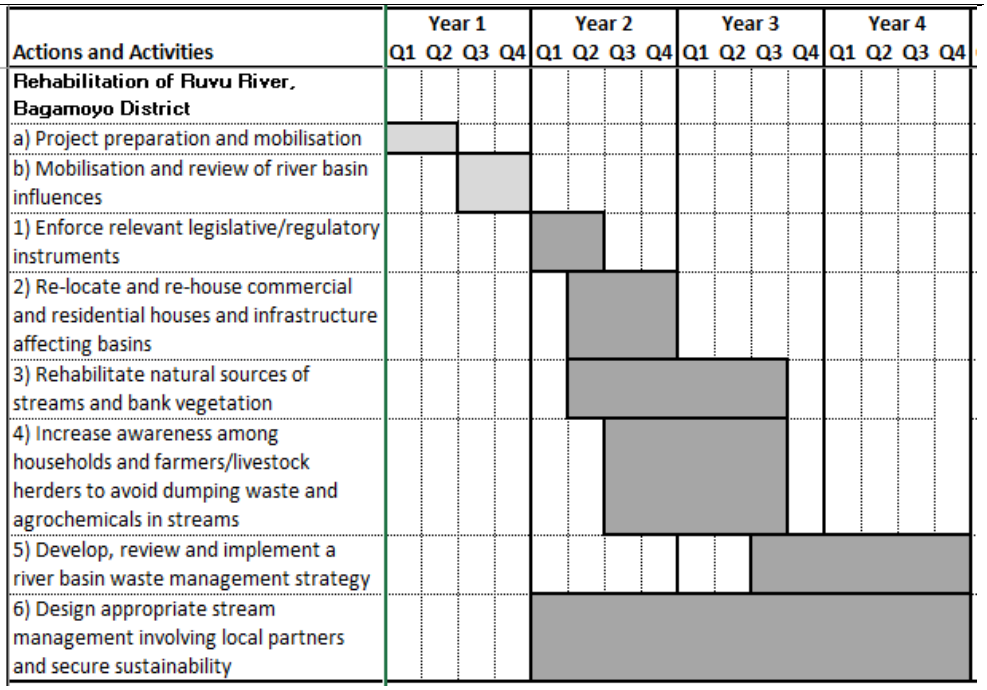
IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp.

Yanda P.Z. and Munishi, P.K.T. 2007. Hydrologic and land use/cover change analysis for the Ruvu River (Uluguru) and Sigi River (East Usambara) watersheds. For WWF/CARE Dar es Salaam, Tanzania. 80 pp.

Tan-L05: Rehabilitation and clean-up of the Ruvu River, Bagamoyo District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Ruvu River basin is the second largest that passes through Bagamoyo District, with tributaries extending from the southwest, over 270 km from beyond Morogoro. The Ruvu River originates in the Uluguru mountains, where small streams combine to form three main tributaries: Mgeta and Ruvu rivres that drain the south side and the Ngerengere River drains the north, in total covering a catchment area of 25,000 km^2. Nutrient and chemical pollution discharged through the Ruvu River into the coastal environment on the western shores of the Zanzibar Channel is well-documented, visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watershed. There are deforestation issues in the upper catchment, water abstraction throughout the river's length and pollution in certain areas.
2. Title:	Rehabilitation and clean-up of Ruvu River, Bagamoyo District
3. Action Reference:	Tan-L05
4. Justification:	Beach pollution was identified as severity level 3, for Bagamoyo District, with pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were also contributing to river and marine pollution. Equally important, the Ruvu River accounts for over 90 % of Dar es Salaam's daily water supply, which in recent times has reduced its capacity to meet the growing demand. There are reports of deteriorating volumes and water quality (e.g. Yanda and Munishi 2007; IUCN, 2010) and evidence of agrochemical and solid wastes discharged into the Ruvu River, that reach the coast. Furthermore, there is strong likelihood that over the coming years, with increasing pressure on the land that the Ruvu River basin drains that agrochemical and solid wastes will increasingly become disposed of or leach into the tributaries of the Ruvu, eventually reaching the coast at Saadani National Park and beyond. Furthermore, marine pollution from the Bagamoyo District will be transported northwards on the prevailing coastal current where it will negatively affect the Tanga Region coastline, in particular the newly established Coelacanth Marine Park and the sensitive coral reef and other habitat therein. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range, and moreso where the Government has a focus on commercial agriculture such as in Wami-Ruvu catchments.

<table>
<tr><td>5. Objective:</td><td colspan="2">By 2025 waters from these the Ruvu River devoid of pollution with riverine and estuarine biodiversity restored.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">The objectives of the Action to rehabilitate Ruvu River Bagamoyo Districts are:
• Clean and safe water in the streams.
• Greater ability of the river banks to absorb small flooding events.
• Reduced solid and liquid wastes discharged to sea.
• Decreased volume of wastes into the streams.
• Reduced wastes washed up along the coast.
• Stream sources rehabilitated and protected.
• Local NGOs capable of managing stream environment.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Develop, review and implement a waste management strategy.
6) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>3,000,000</td></tr>
<tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>8,000,000</td></tr>
<tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr>
<tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr>
</table></td></tr>
</table>

	<table><tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr><tr><td>Total</td><td>13,500,000</td></tr></table> The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Wami-Ruvu River Basin Authority • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (over three hundred thousand) plus Saadani National Park and Bagamoyo Town foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management

	• Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions: • Tan-L04: Safeguarding of Wami River Bagamoyo District • Tan-L27: Urban solid waste collection and processing Bagamoyo Town
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events • ..
18. Comments:	Note: There are a number of initiatives responding to Ruvu River water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated. This Action needs to be aligned with on-going initiatives related to river flows in the Ruvu Basin, but focus more especially on the portions of river and catchments located in the Bagamoyo District portion, with particular emphasis on the quality of the final discharges into the coastal zone. Relevant initiatives are the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness. Also, the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues. References: IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp. Yanda P.Z. and Munishi, P.K.T. 2007. Hydrologic and land use/cover change analysis for the Ruvu River (Uluguru) and Sigi River (East Usambara) watersheds. For WWF/CARE Dar es Salaam, Tanzania. 80 pp.

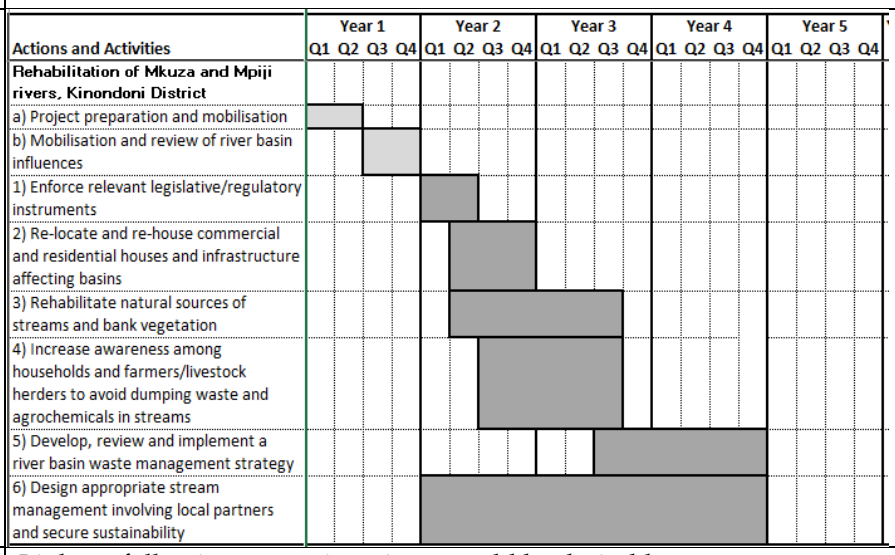
Tan-L06: Rehabilitation and clean-up of Mkuza and Mpiji rivers, Bagamoyo and Kinondoni districts

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Nutrient and chemical pollution discharged through these rivers into the coastal environment on the western shores of the Zanzibar Channel is well-documented, visible especially after heavy rains, with solid wastes and

	sediments discharged being indicative of degraded and polluted watersheds. Southern Bagamoyo District is drained by two large rivers, both of 25-30 km length: the Mkuza River with sources in the streams The Mpiji River forms the seaward part of the district border between Bagamoyo and Kinondoni. Both rivers begin in the higher ground around the forest reserves of Pande. These water sources are threatened from overharvest and land changes and are in need on continued support to ensure their contributions to the flows of the Mkuza and Mpijii rivers.
2. Title:	Rehabilitation and clean-up of Mkuza and Mpiji rivers, Bagamoyo and Kinondoni districts
3. Action Reference:	Tan-L06
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Beach pollution was also identified as severity level 3, for Bagamoyo District, with pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were also contributing to river and marine pollution. Decline in fisheries yields, regarded as a threat of level 4, in both districts that share the Mpiji River, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The two east flowing rivers (Mkuza and Mpiji) that drain western Kinondoni are some of the largest conduits for liquid and solid waste, chemicals and sediment to the north Dar es Salaam coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations in northern Dar es Salaam. Protecting the sources of these two rivers, particularly in the Pange area is a high priority, especially protection from fire (e.g. Doggart, 2003), while other areas of focus identified include water user association formulation and capacity building essential to secure water sources for most of the district towns in the basin to ensure water supply, a borehole inventory in Dar es Salaam, investment to construct more storage facilities (reservoirs, ground water storage) and human resource development, among others (IUCN 2010). Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range.
5. Objective:	By 2025 waters from these two rivers devoid of pollution with riverine and estuarine biodiversity restored.
6. Expected outputs:	The objectives of the Action to rehabilitate Mkuza and Mpijii rivers in Bagamoyo and Kinondoni districts are: • Clean and safe water in the streams. • Greater ability of the river banks to absorb small flooding events. • Reduced solid and liquid wastes discharged to sea. • Decreased volume of wastes into the streams. • Reduced wastes washed up along the coast. • Stream sources rehabilitated and protected. • Local NGOs capable of managing stream environment.
7. Activities:	a) Project design and appraisal.

<table>
<tr><td></td><td colspan="2">b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Develop, review and implement a waste management strategy.
6) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>3,000,000</td></tr>
<tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>8,000,000</td></tr>
<tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr>
<tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr>
<tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>13,500,000</td></tr>
</table>

The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)</td></tr>
</table>

	• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Wami-Ruvu River Basin Authority • Wami Ruvu Basin Water Office • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (over two million) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions: • Tan-L05: Rehabilitation and clean-up of Ruvu River Bagamoyo District • Tan-L27: Urban solid waste collection and processing Bagamoyo Town • Tan-L28: Urban solid waste collection and processing Kinondoni
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events • ..
18. Comments:	

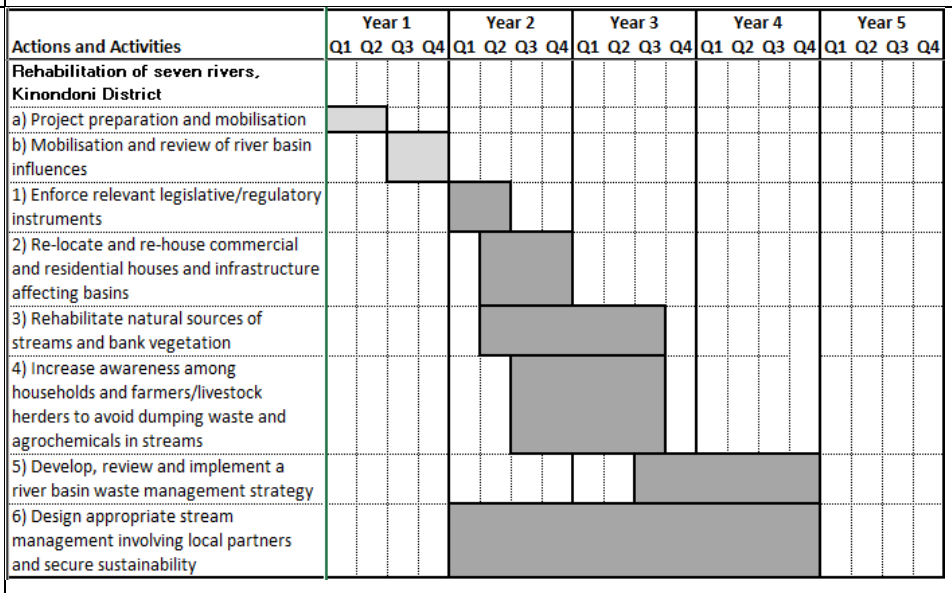
	Note: There are a number of initiatives responding to problems in the Ruvu and Wami River Basins, focused on water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated and theSurface Water Drainage Project which covers the Municipalities of Kinondoni, Ilala and Temeke aims to prepare the investments for a comprehensive Surface Water Drainage System for the Dar es Salaam City. This Action needs to be aligned with on-going initiatives related to river flows in the Wami-Ruvu Basin, in particular the the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness, and the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues. Effort however should remain focused in on the portions of the smaller rivers and catchments located in the Bagamoyo and Kinondoni districts, with particular emphasis on the quality of the final discharges into the coastal zone from the Mkuza and Mpiji rivers. References: Doggart, N. 2003. Pande Game Reserve: A Biodiversity Survey. TFCG Technical Paper 7. DSM, Tz. 1-100 pp IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp.

Tan-L07: Rehabilitation and clean-up of seven rivers, Kinondoni District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Within Kinondoni District, excluding border rivers such as Mpiji (see previous action Tan: L06) and Msimbazi (see next action Tan: L08) There are seven principle, each with several much smaller streams, that discharge into the coastal waters between Ras Kankadya (Msasani Peninsula) and Ras Kiromoni. This stretch of coast, approximately 20 km long, is one of the most polluted in the country. From Ras Kiromoni southwards, with the approximate length of the rivers, these are Nyakasangwe (22 km), Tegeta 28 km, Manyema (17 km), Ndumbwi (3 km), Mbezi (18 km), Mlalakuwa (16 km) and Kijitonyama (25 km). Nutrient and chemical pollution discharged through these rivers into the coastal environment on the western shores of the Zanzibar Channel is well-documented, visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watersheds. These water are important marine biodiversity and fisheries areas, reflected by the presence of the dare s Salaam Marine Reserves (that include the islands and reefs of Bongoyo, Mbudya, Fungu Yasin),
2. Title:	Rehabilitation and clean-up of seven east flowing rivers, Kinondoni District
3. Action Reference:	Tan-L07
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were also contributing to river and marine pollution. Decline in fisheries yields, regarded as a threat of level 4 in both Kinondoni Districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The seven relatively short-lengthed east-flowing rivers that drain Kinondoni are some of the largest conduits for liquid and solid waste, chemicals and sediment to the north Dar es Salaam coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations in northern Dar es Salaam. Protecting the sources of these rivers, particularly in western higher ground areas is a high priority, especially protection from fire if Pande Forest Reserve (e.g. Doggart, 2003). Other areas of focus for intervention include water user association formulation and capacity building essential to secure water sources

<table>
<tr><td></td><td colspan="2">for most of the district towns in the basin to ensure water supply, a borehole inventory in Dar es Salaam, investment to construct more storage facilities (reservoirs, ground water storage) and human resource development, among others (e.g. Babyebonela, 2005; IUCN, 2010).

Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range.</td></tr>
<tr><td>5. Objective:</td><td colspan="2">By 2025 waters from these seven rivers devoid of pollution with riverine and estuarine biodiversity restored.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">The objectives of the Action to rehabilitate seven rivers in Kinondoni District are:
• Clean and safe water in the streams.
• Greater ability of the river banks to absorb small flooding events.
• Reduced solid and liquid wastes discharged to sea.
• Decreased volume of wastes into the streams.
• Reduced wastes washed up along the coast.
• Stream sources rehabilitated and protected.
• Local NGOs capable of managing stream environment.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Develop, review and implement a waste management strategy.
6) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>3,000,000</td></tr>
</table></td></tr>
</table>

	<table><tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>8,000,000</td></tr><tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr><tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr><tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr><tr><td>Total</td><td>13,500,000</td></tr></table> The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Wami-Ruvu River Basin Authority • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (almost two million) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management

	• Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions: Of particular relevance and importance would be links to following local actions: • Tan-L05: Rehabilitation and clean-up of Ruvu River Bagamoyo District • Tan-L15: Sewage treatment facility Kinondoni District • Tan-L15: Sewage treatment facility Ilala District • Tan-L28: Urban solid waste collection and processing Kinondoni • Tan-L29: Urban solid waste collection and processing Ilala District
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events • ..
18. Comments:	Note: There are a number of initiatives responding to problems in the Ruvu and Wami River Basins, focused on water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated and theSurface Water Drainage Project which covers the Municipalities of Kinondoni, Ilala and Temeke aims to prepare the investments for a comprehensive Surface Water Drainage System for the Dar es Salaam City. This Action needs to be aligned with on-going initiatives related to river flows in the Wami-Ruvu Basin, but focus more especially on the smaller rivers and catchments located in the Kinondoni District, with particular emphasis on the quality of the final discharges into the coastal zone. Relevant initiatives are the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness. Also, the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues. References: Babyebonela, T.W. 2005. Solid waste management and river bank stabilization along Nalung'ombe River in Kinondoni Municipality Dar-es-Salaam. Doggart, N. 2003. Pande Game Reserve: A Biodiversity Survey. TFCG Technical Paper 7. DSM, Tz. 1-100 pp IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp.

Tan-L08: Rehabilitation and clean-up of Msimbazi River Basin, Kinondoni and Ilala districts

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Mzimbazi River is the major river basin that drains the Ilala District, bordering to the north in places with Kinondoni District. The Msimbazi River is about 25 km long, with head waters in Pugu Hills Forest Reserve, but includes a basin with at least eight major tributaries on the north banks, themselves mostly 15-25 km long, that feed into the main river. Upriver from the mouth the tributaries are the Sinza, Minyonyoni, Mborohadi, Ubungo, Mgigawa, Makulamula, Luhanga and Kimanga. Msimbazi Creek is the most studied area of Dar es Salaam. A comprehensive body of literature (e.g. Machiwa, 1992; Mwandya, 1993; Lyantagaye, 1996; Kondoro, 1997; Othman 2002) documents the nutrients, chemical, faecal and solid waste pollution discharged through this rivers into the coastal environment as it passes under Selander Bridge, visible especially after heavy rains.
2. Title:	Rehabilitation and clean-up of the Msimbazi River, Kinondoni and Ilala districts
3. Action Reference:	Tan-L08
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Pollution of the beach and nearshore, industrial, sewage and heavy metal were all forms of pollution ranked as level 3 threats in Ilala District. Pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4 in both Kinondoni and Ilala districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 and 3 respectively for Ilala and Kinondoni, with causes linked to flooding and sewage. The Msimbazi River basin is the largest conduit for liquid and solid waste, chemicals and sediment to the north Dar es Salaam coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations in northern Dar es Salaam. Cleaning up and rehabilitating this river and its sources is a high priority. As with other rivers in the Wami-Ruvu Basin, additional areas of focus for intervention include water user association formulation and capacity building essential to secure water sources for most of the district towns in the basin to ensure water supply, a borehole inventory in Dar es Salaam, investment to

<table>
<tr><td></td><td>construct more storage facilities (reservoirs, ground water storage) and human resource development, among others (e.g. Babyebonela, 2005; IUCN, 2010).

Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range.</td></tr>
<tr><td>5. Objective:</td><td>By 2025 waters from the Msimbazi River devoid of pollution with riverine and estuarine biodiversity restored.</td></tr>
<tr><td>6. Expected outputs:</td><td>The objectives of the Action to rehabilitate the Msimbazi River basin are:
• Clean and safe water in the streams.
• Greater ability of the river banks to absorb small flooding events.
• Reduced solid and liquid wastes discharged to sea.
• Decreased volume of wastes into the streams.
• Reduced wastes washed up along the coast.
• Stream sources rehabilitated and protected.
• Local NGOs capable of managing stream environment.</td></tr>
<tr><td>7. Activities:</td><td>a) Project design and appraisal.
b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Develop, review and implement a waste management strategy.
6) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td>The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td>Local residents and businesses may object and block the project.</td></tr>
<tr><td>10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td></td><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr>
<tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>5,000,000</td></tr>
<tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>10,000,000</td></tr>
</table></td></tr>
</table>

Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams	800,000
Develop, review and implement river basin waste management strategy	300,000
Design appropriate stream management involving local partners and secure sustainability	1,000,000
Total	17,700,000

The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.

12. Source of funding:

- Tanzania Government (budget, participation)
- Private Sector (participation)
- NGOs (participation)
- Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:

Strong Local Government coastal development stakeholder capable of effectively coordinating efforts:

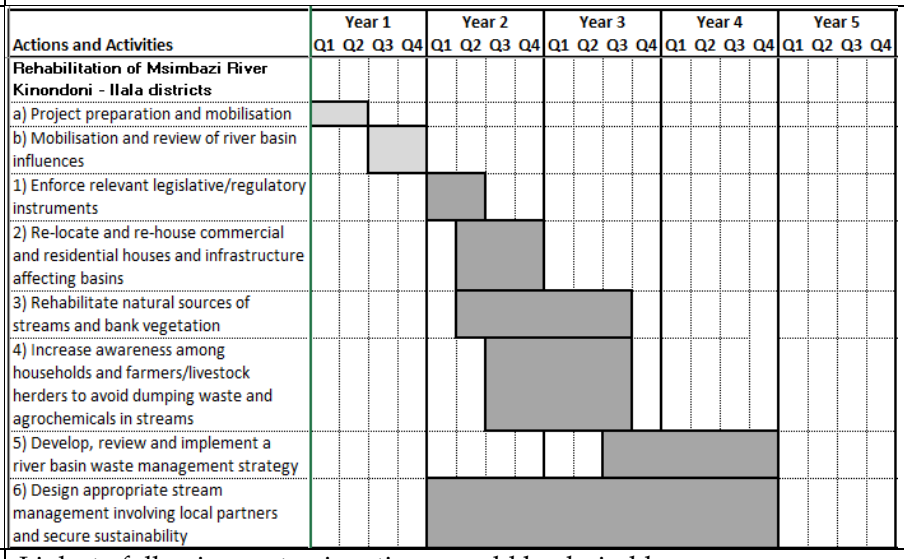
- Wami-Ruvu River Basin Authority
- Contractors
- NGOs
- etc…

14. Beneficiary from the action:

Local residents (over one million) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising

	• Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following local actions: • Tan-L05: Rehabilitation and clean-up of Ruvu River Bagamoyo District • Tan-L15: Sewage treatment facility Kinondoni District • Tan-L15: Sewage treatment facility Ilala District • Tan-L28: Urban solid waste collection and processing Kinondoni • Tan-L29: Urban solid waste collection and processing Ilala District •
17. Performance indicators:	• Water quality (chemistry, BOD, agrochemicals, etc.) • Volumes and types of solid wastes on associated beaches • Records of inundation events • ..
18. Comments:	Note: There are a number of initiatives responding to problems in the Ruvu and Wami River Basins, focused on water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated and theSurface Water Drainage Project which covers the Municipalities of Kinondoni, Ilala and Temeke aims to prepare the investments for a comprehensive Surface Water Drainage System for the Dar es Salaam City. This Action needs to be aligned with on-going initiatives related to river flows in the Wami-Ruvu Basin, but focused exclusively on the Msimbazi River, and catchments, located in the Kinondoni and Ilala districts, with particular emphasis on the quality of the final discharges into the coastal zone. Also of relevance are the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness; and the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues. References: Babyebonela, T.W. 2005. Solid waste management and river bank stabilization along Nalung'ombe River in Kinondoni Municipality Dar-es-Salaam. IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp. Kondoro, J.W.A., 1997. Dispersion of heavy metals along Msimbazi River basin in Dar es Salaam, Tanzania. Tanzania Journal of Science, 23: 1-10. Lyantagaye, S.L.1996. Nutrients and dissolved oxygen distribution in Mzinga Creek and Ocean Road beach. A Third Year Student Project. Department of Zoology and Marine Biology, University of Dar es Salaam. 34p. Machiwa, J.F. 1992. Heavy metal content in coastal sediments off Dar es Salaam, Tanzania. Environment International. 18: 409-415. Mwandya , A.W. 1993. Variability and morphometric relationships of lead and cadmium in *Saccostrea cuccullata* and *Pinctada marginitifera* along the Dar es Salaam coast. Third Year Student Project. Department of Zoology and Marine Biology, University of Dar es Salaam. 31p. Othman, O.C. Speciation of cadmium, copper, lead and zinc in waters of river Msimbazi, Dar es Salaam, Tanzania. Tanz. J. Sci. 28(1): 25-35.

Tan-L09: Rehabilitation and clean-up of Kizinga and Mzinga river basins, Ilala and Temeke districts

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Dar es Salaam Harbour is the seaward portion of Mzinga Creek, fed by two main tributaries, the Kizinga and Mzinga rivers, of 17 km and 10 km in length respectively. The Kizinga and Mzinga river systems originate from the Pugu/Kisarawe hills with the Kizinga having a catchment area of 432 km^2, and the Mzinga 41 km^2 (IUCN, 2004). The water in the Mzinga and Kizinga rivers meets domestic standards for drinking water, notably in the upper reaches. Mzinga is not perennial while Kizinga flows throughout the year and support domestic water supply in the Mbagala area (Mjemah, 2007). The outflows from the two rivers that drain southern Dar es Salaam are well documented sources of various pollutants (e.g. Machiwa, 1992; Mwandya, 1993; Lyantagaye, 1996; Othman, 2002; Abbu and Lyimo, 2007), including nutrients, chemicals, oils, faecal and solid waste pollution, that are carried into coastal environment as these waters discharge through Mzinga Creek and pass the Dar es Salaam Port.
2. Title:	Rehabilitation and clean-up of Kizinga and Mzinga river basins, Ilala and Temeke districts
3. Action Reference:	Tan-L09
4. Justification:	Pollution of the beach and nearshore, industrial, sewage and heavy metal were all forms of pollution ranked as level 3 threats in Ilala District. Beach and marine pollution from heavy metals, industrial and oil pollution were all identified as severity level 3, for Temeke District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems, industry and garages dumping into the Kizinga and Mzinga rivers. Decline in fisheries yields, regarded as a threat of level 4 in both Ilala and Temeke districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 for Ilala, with causes linked to flooding and sewage. The Kizinga and Mzinga rivers are the largest conduit for liquid and solid waste, chemicals and sediment to the central Dar es Salaam coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast, likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations in northern Dar es Salaam. Cleaning up and rehabilitating these two rivers that converge at Mzinga Creek is a high priority. As with other rivers in the Wami-Ruvu Basin, additional areas of focus for intervention include water user association formulation and capacity

<table>
<tr><td></td><td colspan="2">building essential to secure water sources for most of the district towns in the basin to ensure water supply, a borehole inventory in Dar es Salaam, investment to construct more storage facilities (reservoirs, ground water storage) and human resource development, among others (e.g. Babyebonela, 2005; IUCN, 2010).

Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range, and moreso where the Government has a focus on commercial agriculture such as in Wami-Ruvu catchments.</td></tr>
<tr><td>5. Objective:</td><td colspan="2">By 2025 waters from these two rivers devoid of pollution with riverine and estuarine biodiversity restored.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">The objectives of the Action to rehabilitate Kizinga and Mzingas rivers in Ilala and Temeke districts are:
• Clean and safe water in the streams.
• Greater ability of the river banks to absorb small flooding events.
• Reduced solid and liquid wastes discharged to sea.
• Decreased volume of wastes into the streams.
• Reduced wastes washed up along the coast.
• Stream sources rehabilitated and protected.
• Local NGOs capable of managing stream environment.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Develop, review and implement stream management strategy.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances).
3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).
4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers.
5) Develop, review and implement a waste management strategy.
6) Design appropriate stream management.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Hydraulic modelling
• Access to information
• Green-green infrastructure
• IWRM planning
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Modellers
• Physical Planners
• Pollution chemists, freshwater ecologists and botanists
• Socio-economists and resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table><tr><th>Item</th><th>Estimate in USD</th></tr><tr><td>Project preparation and mobilisation</td><td>100,000</td></tr></table></td></tr>
</table>

	<table><tr><td>Mobilisation and review of river basin influences</td><td>200,000</td></tr><tr><td>Enforce relevant legislative/regulatory instruments</td><td>300,000</td></tr><tr><td>Re-locate and re-house commercial and residential houses and infrastructure affecting basins</td><td>3,000,000</td></tr><tr><td>Rehabilitate natural sources of streams and bank vegetation</td><td>8,000,000</td></tr><tr><td>Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams</td><td>600,000</td></tr><tr><td>Develop, review and implement river basin waste management strategy</td><td>300,000</td></tr><tr><td>Design appropriate stream management involving local partners and secure sustainability</td><td>1,000,000</td></tr><tr><td>Total</td><td>13,500,000</td></tr></table> The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government coastal development stakeholder capable of effectively coordinating efforts: • Wami-Ruvu River Basin Authority • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (over one million) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:

Actions and Activities	Year 1 Q1 Q2 Q3 Q4	Year 2 Q1 Q2 Q3 Q4	Year 3 Q1 Q2 Q3 Q4	Year 4 Q1 Q2 Q3 Q4	Year 5 Q1 Q2 Q3 Q4
Rehabilitation of Kizinga and Mzinga rivers Ilala - Temeke districts					
a) Project preparation and mobilisation					
b) Mobilisation and review of river basin influences					
1) Enforce relevant legislative/regulatory instruments					
2) Re-locate and re-house commercial and residential houses and infrastructure affecting basins					
3) Rehabilitate natural sources of streams and bank vegetation					
4) Increase awareness among households and farmers/livestock herders to avoid dumping waste and agrochemicals in streams					
5) Develop, review and implement a river basin waste management strategy					
6) Design appropriate stream management involving local partners and secure sustainability					

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following local actions:

- Tan-L08: Rehabilitation and clean-up of Msimbazi River Basin
- Tan-L10: Safeguarding Nguva River and other rivers in Temeke District
- Tan-L16: Sewage treatment facility Ilala District
- Tan-L17: Sewage treatment facility Temeke District
- Tan-L29: Urban solid waste collection and processing Ilala District
- Tan-L30: Urban solid waste collection and processing Temeke District

17. Performance indicators:

- Water quality (chemistry, BOD, agrochemicals, etc.)
- Volumes and types of solid wastes on associated beaches
- Records of inundation events
- ..

18. Comments:

Note: There are a number of initiatives responding to problems in the Ruvu and Wami River Basins, focused on water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated and theSurface Water Drainage Project which covers the Municipalities of Kinondoni, Ilala and Temeke aims to prepare the investments for a comprehensive Surface Water Drainage System for the Dar es Salaam City. This Action needs to be aligned with on-going initiatives related to river flows in the Wami-Ruvu Basin, but focused exclusively on the Kizinga and Mzinga rivers, and their catchments, with particular emphasis on the quality of the final discharges into the coastal zone.

Other relevant initiatives are the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness; and the World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues.

References:

Abbu A.A. and Lyimo, T.J. 2007. Assessment of fecal bacteria contamination in sewage and non-sewage impacted mangrove ecosystems along the coast of Dar es Salaam. Tanz. J. Sci. 33: 1-16.

Babyebonela, T.W. 2005. Solid waste management and river bank stabilization along Nalung'ombe River in Kinondoni Municipality Dar-es-Salaam.

IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp.

Lyantagaye, S.L.1996. Nutrients and dissolved oxygen distribution in Mzinga Creek and Ocean Road beach. A Third Year Student Project. Department of Zoology and Marine Biology, University of Dar es Salaam. 34p.

Machiwa, J.F. 1992. Heavy metal content in coastal sediments off Dar es Salaam, Tanzania. Environment International. 18: 409-415.

Mjemah, I.C. 2007. Hydrogeological and Hydrogeochemical Investigation of a Coastal Aquifer in Dar-es-Salaam, Tanzania. Dissertation submitted in fulfillment of the requirements for the award of the degree of Doctor in Sciences: Geology. Laboratory for Applied Geology and Hydrogeology, Geological Institute, Ghent University.

Mwandya , A.W. 1993. Variability and morphometric relationships of lead and cadmium in *Saccostrea cuccullata* and *Pinctada marginitifera* along the Dar es Salaam coast. Third Year Student Project. Department of Zoology and Marine Biology, University of Dar es Salaam. 31p.

Tan-L10: Safeguarding Nguva River and other rivers, Temeke District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Nguva River basin is the largest in Temeke District, extending some 30 km from the raised plateau in the west and to the south, traversing some 20 km of farmland and shrub area before discharging on the coast in the mangrove creek at Gezaulole. There are five other, small rivers in the district, mostly between 3-10 km in length. The Mbasi River forms the border with Mkuranga District to the south. The outflows from rivers in northern Temeke (associated with Mzinga Creek and the harbour) and two other Dar es Salaam districts are well documented sources of various pollutants (e.g. Machiwa, 1992; Mwandya, 1993; Lyantagaye, 1996; Othman, 2002), including nutrients, chemicals, oils, faecal and solid waste pollution, that are carried into coastal environment as these waters discharge through Mzinga Creek and pass the Dar es Salaam Port. With the exception of these northern rivers (see Tan-L09), Temeke's other10-12 principle rivers and streams are clean (see Abbu and Lyimo, 2007). Existing threats are minor in the present day and include river sand and water abstraction in a few places. As the city of Dar es Salaam expands south, following completion of the Kurasini Bridge, the pressure on the smaller Temeke catchments is bound to increase dramatically. Development of new settlements and industry has already begun in Temeke and is projected to accelerate once the Kurasini Bridge is completed, expected by June 2015.
2. Title:	Safeguarding the Nguva River and other rivers in Temeke District
3. Action Reference:	Tan-L10
4. Justification:	Beach and marine pollution from heavy metals, industrial and oil pollution were all identified as severity level 3, for Temeke District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems, industry and garages dumping into the Kizinga and Mzinga rivers. Decline in fisheries yields, regarded as a threat of level 4 in both Ilala and Temeke districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 for Ilala, with causes linked to flooding and sewage. The Nguva River is the largest potential conduit for liquid and solid waste, chemicals and sediment to the central Dar es Salaam coastline, that would cause beach and sea pollution which affects health and marine life, likely affecting nearby small islands and coral reefs (including the Sinda Island Marine Reserve), an important tourist destination in southern Dar es Salaam.

	While there is no documented evidence of agrochemical or solid wastes discharged from the Nguva River, there is strong likelihood that over the coming years, with increasing pressure on the land that the Nguva River basin drains that agrochemical and solid wastes will increasingly become disposed of or leach into its tributaries, eventually reaching the coast. The emphasis of this action is to prevent the degradation and pollution to the 10-12 principle watercourse in Temeke (excluding Mzinga and Mzinga rivers) that has been witnessed in the neighbouring districts of Ilala and Kinondoni. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range.	
5. Objective:	By 2025 waters from Temeke rivers continue to be devoid of pollution with riverine and estuarine biodiversity restored.	
6. Expected outputs:	The objectives of the Action to safeguard the Nguva River and other rivers (10-12) in Temeke District are: • Maintain rivers clean and safe water in the streams. • Maintain greater ability of the river banks to absorb small flooding events. • Prevent solid and liquid wastes discharged into rivers and then to sea. • Prevent volume of wastes into the streams. • Reduced wastes washed up along the coast. • Stream sources rehabilitated and protected. • Local NGOs capable of managing stream environment.	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Develop, review and implement stream management strategy. 2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances). 3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes). 4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers. 5) Develop, review and implement a waste management strategy. 6) Design appropriate stream management.	
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.	
9. Risks:	Local residents and businesses may object and block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Hydraulic modelling • Access to information • Green-green infrastructure • IWRM planning • …
	Human Resources	• Civil and water engineers • Modellers • Physical Planners

		• Pollution chemists, freshwater ecologists and botanists • Socio-economists and resettlement specialists • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Mobilisation and review of river basin influences	200,000
Enforce relevant legislative/regulatory instruments	300,000
Re-locate and re-house commercial and residential houses and infrastructure affecting basins	1,000,000
Rehabilitate natural sources of streams and bank vegetation	2,000,000
Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams	600,000
Develop, review and implement river basin waste management strategy	300,000
Design appropriate stream management involving local partners and secure sustainability	1,000,000
Total	5,500,000

The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.

12. Source of funding:

- Tanzania Government (budget, participation)
- Private Sector (participation)
- NGOs (participation)
- Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:

Strong Local Government coastal development stakeholder capable of effectively coordinating efforts:

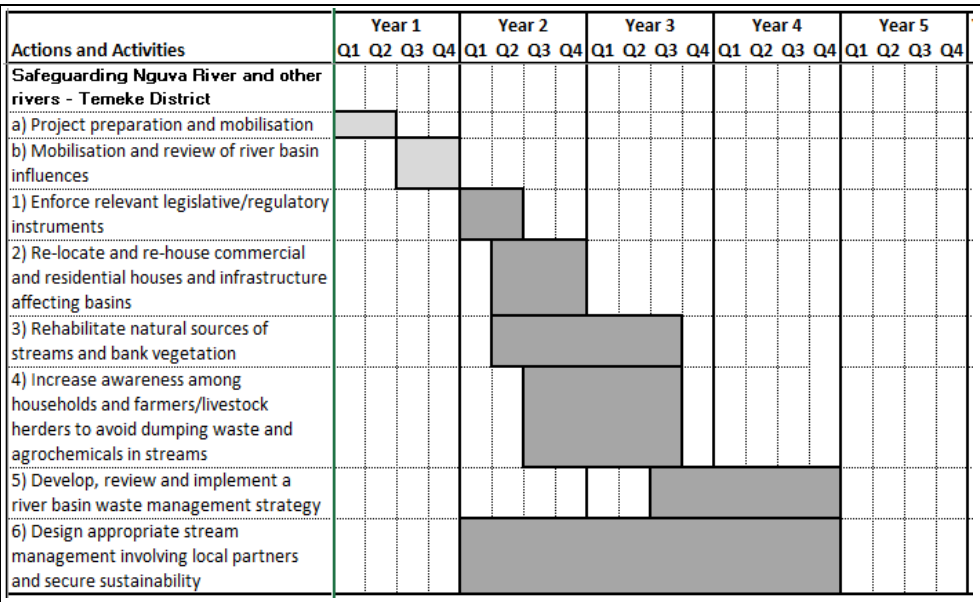
- Wami-Ruvu River Basin Authority
- Contractors
- NGOs
- etc…

14. Beneficiary from the action:

Local residents (tens of thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following local actions:

- Tan-L09: Rehabilitation and clean-up of Kizinga and Mzinga river basins
- Tan-L16: Sewage treatment facility Ilala District
- Tan-L17: Sewage treatment facility Temeke District
- Tan-L29: Urban solid waste collection and processing Ilala District
- Tan-L30: Urban solid waste collection and processing Temeke District

17. Performance indicators:

- Water quality (chemistry, BOD, agrochemicals, etc.)
- Volumes and types of solid wastes on associated beaches
- Records of inundation events
- ..

18. Comments:

Note: There are a number of initiatives responding to problems in the Ruvu and Wami River Basins (that include the smaller rivers of Temeke District), focused on water shortages and quality, especially given the importance of this source for the burgeoning Dar es Salaam consumer. Impacts of climate change have also been more recently investigated and theSurface Water Drainage Project which covers the Municipalities of Kinondoni, Ilala and Temeke aims to prepare the investments for a comprehensive Surface Water Drainage System for the Dar es Salaam City. This Action needs to be aligned with on-going initiatives related to river flows in the Wami-Ruvu Basin, but focused exclusively on the Temeke rivers, and their catchments, with particular emphasis on the quality of the final discharges into the coastal zone.

Relevant initiatives are the UNDP/GEF support for the project "Securing watershed services through SLM in the Ruvu and Zigi catchments Eastern Arc Region", with the Ministry of Water (2014-19), focused on policy, capacity, implementation and awareness. Also, the World Bank supported "Water sector

	development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues. References: Abbu A.A. and Lyimo, T.J. 2007. Assessment of fecal bacteria contamination in sewage and non-sewage impacted mangrove ecosystems along the coast of Dar es Salaam. Tanz. J. Sci. 33: 1-16. IUCN Eastern and Southern Africa Programme, 2010. The Ruvu Basin: A Situation Analysis., xvi + 96 pp. Machiwa, J.F. 1992. Heavy metal content in coastal sediments off Dar es Salaam, Tanzania. Environment International. 18: 409-415. Mjemah, I.C. 2007. Hydrogeological and Hydrogeochemical Investigation of a Coastal Aquifer in Dar-es-Salaam, Tanzania. Dissertation submitted in fulfillment of the requirements for the award of the degree of Doctor in Sciences: Geology. Laboratory for Applied Geology and Hydrogeology, Geological Institute, Ghent University. Mwandya , A.W. 1993. Variability and morphometric relationships of lead and cadmium in *Saccostrea cucullata* and *Pinctada marginitifera* along the Dar es Salaam coast. Third Year Student Project. Department of Zoology and Marine Biology, University of Dar es Salaam. 31p.

Tan-L11: Rehabilitation and clean-up of lower Rufiji River and safeguarding the Mohoro River, Rufiji District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. One major water body, the Rufiji River, drains approximately 30 % of Tanzania area (some177,000 sq. km) and is the largest river in the country, penetrates the district. Numerous tributaries exist on both banks of the Rufiji River and other four small coastal rivers drain directly into the sea, the largest being the Mohoro River in the southern section of the Rufiji delta. The Rufiiji delta is the largest estuarine mangrove forest in East Africa, with an estimated surface area of 53 km^2. The Mohoro River extends from the wooded hills of Kilwa District to the south, for some 70 km in length, discharging in the southern part of the Rufiji delta. Large plantations in the highland drain into Rufiji basin and hence fertilizers, pesticides, herbicides and fungicides may pose a threat. Organochlorine pesticides are reportedly used to control crab pest in rice paddies in the lower Rufiji River portion (Stadlinger et al 2003), potentially affecting carapace formation in prawn and other shellfish. The Mohoro River has not been studies in terms of water quality or threats, but given the increasing development in the southern part of the Rufiji District since the completion of the Mkapa Bridge across the Rufiji River, it is anticipated that catchment and pollution problems associated with the Mohoro River are potential future threats. Any sediment, nutrient or chemical pollution discharged through these rivers into the coastal environment on the western shores of the Mafia Channel could potentially impact on the Mafia island Marine Park, as well as the population of whale sharks now know to be attracted to the feeding grounds in the Mafia Channel.
2. Title:	Rehabilitation and clean-up of lower Rufiji River and safeguarding the Mohoro River, Rufiji District
3. Action Reference:	Tan-L11
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4 for Rufiji District, with pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Decline in fisheries yields, was also regarded as a threat of level 4, attributed in part to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The Rufiji River (and to a much lesser extent the Mohoro River) is the largest conduit for liquid and solid waste, chemicals and sediment into the Mafia Channel, potentially causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats). Pollution and sediment from these rivers extend many kilometres along the

	coast (affecting nearby small islands and coral reefs that are part of the Mafia Island Marine Park), and potentially resulting in negative publicity of this important tourist destination. The need to address the use of pesticides in the lower Rufiji River (floodplain and delta) and safeguard the catchment and land uses that impact on the Mohoro River combine urgent action and mitigation of future impacts. Actions are aimed at improving water quality and flow rates; both being potentially important, especially where there are salinity-sensitive fisheries, as there are associated with most estuaries given the 4 m tidal range, and moreso where the Government has a focus on commercial agriculture such as in Rufiji catchments.	
5. Objective:	By 2025 waters from these two rivers devoid of pollution with riverine and estuarine biodiversity restored.	
6. Expected outputs:	The objectives of the Action to rehabilitate the lower Rufiji River and safeguard the Mohoro River are: • Clean and safe water in the streams. • Greater ability of the river banks to absorb small flooding events. • Reduced solid and liquid wastes discharged to sea. • Decreased volume of wastes into the streams. • Reduced wastes washed up along the coast. • Stream sources rehabilitated and protected. • Local NGOs capable of managing stream environment.	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Develop, review and implement stream management strategy. 2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing riverine environment (e.g. re-locate and re-house commercial and residential houses impinging on the river bank set-back distances). 3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes). 4) Increase awareness among households to avoid dumping waste and agrochemicals and rivers in streams and rivers. 5) Develop, review and implement a waste management strategy. 6) Design appropriate stream management.	
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the natural environment, enforcing relevant laws that impinge on the watersheds and river basins, that are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to clean-up the neighbour riverine environment.	
9. Risks:	Local residents and businesses may object and block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Hydraulic modelling • Access to information • Green-green infrastructure • IWRM planning • …
	Human Resources	• Civil and water engineers • Modellers • Physical Planners • Pollution chemists, freshwater ecologists and botanists • Socio-economists and resettlement specialists • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Mobilisation and review of river basin influences	200,000
Evaluate agrochemical use and enforce relevant legislative/regulatory instruments	1,000,000
Re-locate and re-house commercial and residential houses and infrastructure affecting basins	1,000,000
Rehabilitate natural sources of streams and bank vegetation	5,000,000
Increase awareness among households and farmers/livestock herders to avoid dumping waste in streams	600,000
Develop, review and implement river basin waste management strategy	300,000
Design appropriate stream management involving local partners and secure sustainability	1,000,000
Total	9,200,000

The coarse budget does not provide for re-housing or other costs associated with illegal squatters or illegal land-uses, which are considered a government issue.

12. Source of funding:

- Tanzania Government (budget, participation)
- Private Sector (participation)
- NGOs (participation)
- Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:

Strong Local Government coastal development stakeholder capable of effectively coordinating efforts:

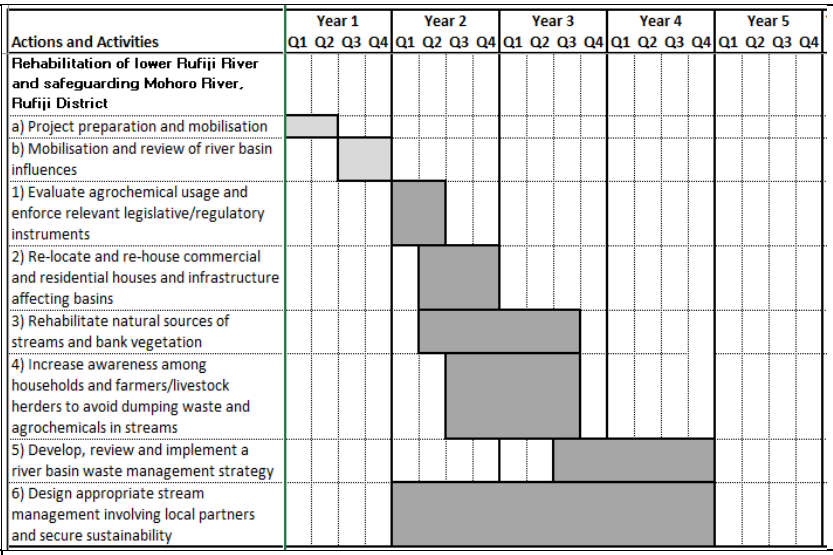
- Rufiji River Basin Authority
- Rufiji River Water Board
- Contractors
- NGOs
- etc…

14. Beneficiary from the action:

Local residents (tens of thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation and pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following local actions:

- Tan-L46: Prawn fisheries support programme for Rufiji District

17. Performance indicators:

- Water quality (chemistry, BOD, agrochemicals, etc.)
- Volumes and types of solid wastes on associated beaches
- Records of inundation events
- ..

18. Comments:

Note: There are a number of initiatives responding to problems in the Rufiji River Basin, focused on water quality and flows, hydroelectric power potential, fisheries, irrigation of small-scale and commercial scale rice and other agricultural uses, wildlife needs, the Selous Game Reserve, among others. This Action needs to be aligned with on-going initiatives related to river flows in the Rufiji River, but focused exclusively on the lower floodplain and deltas areas, and their catchments, with particular emphasis on the quality of the final discharges into the coastal zone and on the little-studied Mohoro River basin.

Relevant initiatives are the Kilombero and loer Rufiji wetlands ecosyetm project, supported by Belgium with Min. Nat. Res. Tourism (2012-2017); the DFID-supported water resources and climate change project, with the Rufiji River Basin Organisation (RBO), focused on capacity and implementation (2013-2015). World Bank supported "Water sector development IWSS [International Water Stewardship Standard] in nine basins", partnered with the nine river basin authorities, addressing policy related issues.

References:

Stadlinger, N., Gyllbäck, E., Tuomaala, S., Porseryd, T., Kumblad, L., Kautsky, N., Mmochi, A. and Mwaipopo, R. 2009. Pesticide use among small-scale rice farmers in Tanzania -risk awareness and possible effects on adjacent marine ecosystems. Sixth WIOMSA Scientific Symposium, St. Denis, La Réunion.

Tan-L12: Sewage collection and treatment facilities for Tanga City, Tanga Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. A body of literature documents high nutrient and faecal coliform bacteria levels in waters off the Tanga City, discharged through the city sewerage system with only primary screening, and from seepage of sewage into small rivers and streams, directly into the coastal environment, Tanga Bay and western shores of the Pemba Channel.
2. Title:	Sewage collection and treatment facilities for Tanga City, Tanga Urban District
3. Action Reference:	Tan-L12
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Tanga Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 5, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over 50,000 households in Tanga City (almost 300,000 people) is treated only to primary (screening) level and sewage pollution to the marine environment is continuous; causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres along the west coast of Pemba Channel (likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city. Further, inadequate urban sanitation, also causes health problems from contaminated ground and surface water as well as from water-borne diseases.
5. Objective:	By 2025 at least 80% of Tanga City households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Tanga City in Tanga Urban District are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes. 4) Sewage collection system

<table>
<tr><td></td><td colspan="2">5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Connecting existing sewage collection system</td><td>5,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>15,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>

The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Tanga Urban Water Supply and Sanitation (Tanga UWASA)
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (three hundred thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1 Q1 Q2 Q3 Q4	Year 2 Q1 Q2 Q3 Q4	Year 3 Q1 Q2 Q3 Q4	Year 4 Q1 Q2 Q3 Q4	Year 5 Q1 Q2 Q3 Q4
Sewage facilities for Tanga City					
Project preparation and mobilisation					
Initial studies, design and engineering,					
Project management (includes construction management)					
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.					
Sewage collection system					
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads					
Construction: civil, mechanical, etc., Contingency.					
Supplies, personnel (hiring and training/capacity building)					

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L01: Rehabilitation and clean-up of four east-flowing rivers in Mkinga District
- Tan-L02: Rehabilitation and clean-up of Zigi and Mkulumzi rivers through Tanga Urban and Muheza districts
- Tan-L26: Domestic waste treatment facility Pangani Town

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

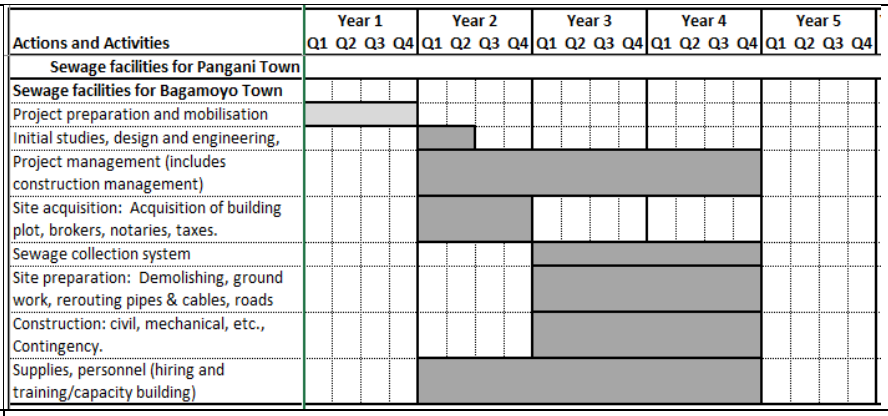
..

Tan-L13: Sewage collection and treatment facilities for Pangani town, Pangani District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there is no evidence of high nutrient and faecal coliform bacteria levels in waters off the Pangani town, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, the western shores of the Pemba Channel and drifting north to the Coelacanth Marine Park.
2. Title:	Sewage collection and treatment facilities for Pangani town, Pangani District
3. Action Reference:	Tan-L13
4. Justification:	Beach pollution was identified as severity level 4, for Tanga Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Marine pollution was ranked with severity level 2. Decline in fisheries yields, regarded as a threat of level 5, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Agrochemicals were contributing to marine pollution. Sewage from over 8,000 inhabitants in Pangani Town is not treated and ultimately enters local aquifers and the marine environment is continuous; causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres along the west coast of Pemba Channel (likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city.
5. Objective:	By 2025 at least 80% of Pangani town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to install a sewage system of Pangani town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.

<table>
<tr><td></td><td colspan="2">4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>10,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>10,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Tanga Urban Water Supply and Sanitation (Tanga UWASA)
• Pangani Urban Water Supply and Sanitation Authority
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (above 8,000) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

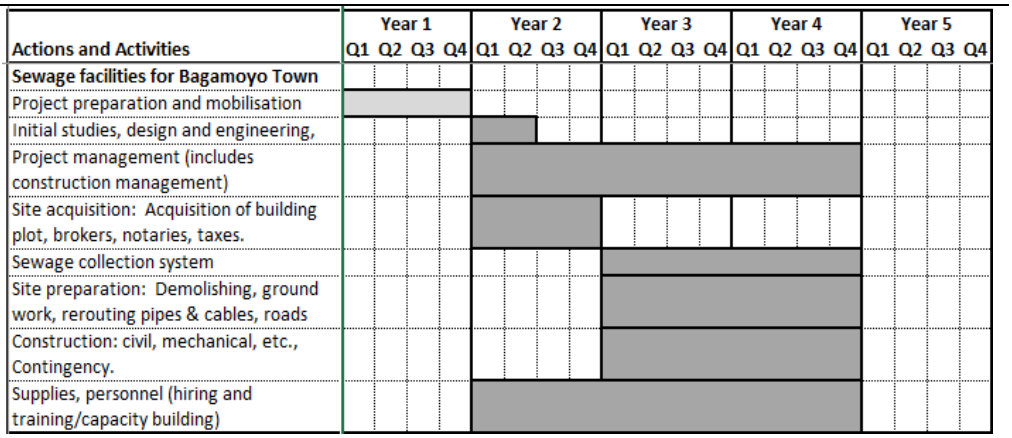
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L12: Sewage collection and treatment facilities for Tanga City • Tan-L25: Domestic waste treatment facility Tanga City • Tan-L26: Domestic waste treatment facility Pangani Town
17. Performance indicators:	• Water quality (chemistry, BOD, etc.) • Volumes and types of solid wastes on associated beaches • Households connected to sewerage system
18. Comments:	

Tan-L14: Sewage collection and treatment facilities for Bagamoyo town, Bagamoyo District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there is no evidence of high nutrient and faecal coliform bacteria levels in waters off Bagamoyo town, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, the western shores of the Pemba Channel and drifting north to the Saadani National Park.
2. Title:	Sewage collection and treatment facilities for Bagamoyo town, Bagamoyo District
3. Action Reference:	Tan-L14:
4. Justification:	Beach pollution was both identified as severity level 3 for Bagamoyo District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over households in Bagamoyo Town (two hundred thousand people) have only primary sewage treatment systems and sewage pollution to the marine environment is continuous; causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres along the west coast of Zanzibar Channel (likely affecting nearby small islands and coral reefs), and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease in Bagamoyo (e.g. Mattioli et al 2012). The district has experienced a high average annual growth rate between 2002 and 2012 of 3.45 % leading to more than 42.30 % increase of the population over the ten-year period and documenting a significant in-migration. The population density in the district has grown to 37 persons/km2 in 2012 from 26 persons/km2 of 2002. Bagamoyo town and surrounding urban and peri-urban areas witness the greatest impacts from increasing population. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Bagamoyo Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Bagamoyo Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters.

<table>
<tr><td></td><td colspan="2">• Reduced sewage wastes discharged to sea.
• Reduced wastes and pathogens washed up along the coast.
• Local LGA capable of managing sewage system.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Initial studies, design and engineering,
2) Project management (includes construction management)
3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.
4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>15,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>15,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>34,300,000</td></tr>
</table>

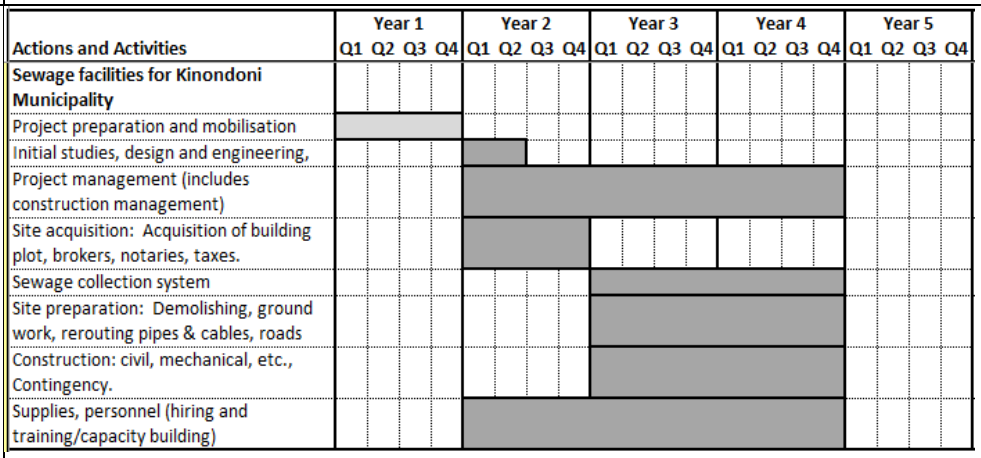
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (two hundred thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs</td></tr>
</table>

	resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L05: Rehabilitation and clean-up of Ruvu River Basin • Tan-L27: Domestic waste treatment facility Bagamoyo Town • Tan-L57: Urban planning for Bagamoyo Town
17. Performance indicators:	• Water quality (chemistry, BOD, etc.) • Volumes and types of solid wastes on associated beaches • Households connected to sewerage system
18. Comments:	References: Mattioli et al 2012. Hands and water as vectors of diarrheal pathogens in Bagamoyo, Tanzania. Environmental Science & Technology (Impact Factor: 5.48). 11/2012; DOI: 10.1021/es303878d

Tan-L15: Sewage collection and treatment facilities for Kinondoni Municipality

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Nutrient and chemical pollution discharged through local rivers into the coastal environment on the western shores of the Zanzibar Channel is well-documented, visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watersheds. These water are important marine biodiversity and fisheries areas, reflected by the presence of the dare s Salaam Marine Reserves (that include the islands and reefs of Bongoyo, Mbudya, Fungu Yasin). Currently there is low level but constant sewage and nutrient seepage into the marine environment though not documented. The projected increase in population is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment. The need exists for a comprehensive treatment of sewage for inhabitants of Kinondoni.
2. Title:	Sewage collection and treatment facilities for Kinondoni Municipality
3. Action Reference:	Tan-L15
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Untreated sewage presently enters the marine environment from seven relatively short-lengthed east-flowing rivers that drain Kinondoni. Together with stormn drains, these are some of the largest conduits for liquid and solid waste, chemicals and sediment to the north Dar es Salaam coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations in northern Dar es Salaam. Decline in fisheries yields, regarded as a threat of level 4 in Kinondoni District, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Kinondoni Municipality households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Kinondoni Municipality are:

<table>
<tr><td></td><td colspan="2">• Fully operational sewage treatment plants where appropriate.
• Effective and sustainable sewage collection systems in place.
• Clean and safe water in coastal waters.
• Reduced sewage wastes discharged to sea.
• Reduced wastes and pathogens washed up along the coast.
• Local LGA capable of managing sewage system.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Initial studies, design and engineering,
2) Project management (includes construction management)
3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.
4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>15,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>15,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>34,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (two million) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users</td></tr>
</table>

	(including fishers) from reduced sewage pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L07: Rehabilitation and clean-up of seven rivers, Kinondoni District • Tan-L15: Sewage treatment facility Ilala District • Tan-L28: Urban solid waste collection and processing Kinondoni • Tan-L29: Urban solid waste collection and processing Ilala District
17. Performance indicators:	• Water quality (chemistry, BOD, etc.) • Volumes and types of solid wastes on associated beaches • Households connected to sewerage system
18. Comments:	

Tan-L16: Sewage collection and treatment facilities for Ilala Municipality

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Msimbazi Creek is the most studied area of Dar es Salaam (see Tan-L08). Nutrients, chemical, faecal and solid waste pollution discharged through this rivers into the coastal environment as it passes under Selander Bridge, visible especially after heavy rains. Despite there being no sewage treatment system other that simple soak-aways, low level but constant sewage and nutrient seepage into the marine environment is likely taking place. The projected increase in population is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment.
2. Title:	Sewage collection and treatment facilities for Ilala Municipality
3. Action Reference:	Tan-L16
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Pollution of the beach and nearshore, industrial, sewage and heavy metal were all forms of pollution ranked as level 3 threats in Ilala District. Pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4 in both Kinondoni and Ilala districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 and 3 respectively for Ilala and Kinondoni, with causes linked to flooding and sewage. Establishing a sewage collection and treatment facility is the greatest measure to reducing pollution into the coastal waters of Dar es Salaam.
5. Objective:	By 2025 at least 80% of Ilala Municipality households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Ilala Municipalityare: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes. 4) Sewage collection system 5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads

<table>
<tr><td></td><td colspan="2">6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>15,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>15,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>34,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (two million) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1 Q1	Q2	Q3	Q4	Year 2 Q1	Q2	Q3	Q4	Year 3 Q1	Q2	Q3	Q4	Year 4 Q1	Q2	Q3	Q4	Year 5 Q1	Q2	Q3	Q4
Sewage facilities for Ilala Municipality																				
Project preparation and mobilisation																				
Initial studies, design and engineering,																				
Project management (includes construction management)																				
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																				
Sewage collection system																				
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads																				
Construction: civil, mechanical, etc., Contingency.																				
Supplies, personnel (hiring and training/capacity building)																				

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L05: Rehabilitation and clean-up of Ruvu River Bagamoyo District
- Tan-L15: Sewage treatment facility Kinondoni District
- Tan-L28: Urban solid waste collection and processing Kinondoni
- Tan-L29: Urban solid waste collection and processing Ilala District

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

Tan-L17: Sewage collection and treatment facilities for Temeke Municipality

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Dar es Salaam Harbour is the seaward portion of Mzinga Creek, fed by two main tributaries, the Kizinga and Mzinga rivers that drain southern Dar es Salaam. Pollution is well documented, including nutrients, chemicals, oils, faecal and solid waste pollution, that are carried into coastal environment as these waters discharge through Mzinga Creek and pass the Dar es Salaam Port. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, drifting into the Dar es Salaam Marine Reserves (both north and south areas).
2. Title:	Sewage collection and treatment facilities for Temeke Municipality
3. Action Reference:	Tan-L17
4. Justification:	Pollution of the beach and nearshore, industrial, sewage and heavy metal were all forms of pollution ranked as level 3 threats in Ilala District. Beach and marine pollution from heavy metals, industrial and oil pollution were all identified as severity level 3, for Temeke District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems, industry and garages dumping into the Kizinga and Mzinga rivers. Decline in fisheries yields, regarded as a threat of level 4 in both Ilala and Temeke districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 for Ilala, with causes linked to flooding and sewage. Installing a complete sewage system for Temeke is a high priority.
5. Objective:	By 2025 at least 80% of Temeke Municipality households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Temeke Municipality are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management)

<table>
<tr><td></td><td colspan="2">3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.
4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>15,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>15,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>34,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (two hundred thousand) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1 Q1	Q2	Q3	Q4	Year 2 Q1	Q2	Q3	Q4	Year 3 Q1	Q2	Q3	Q4	Year 4 Q1	Q2	Q3	Q4	Year 5 Q1	Q2	Q3	Q4
Sewage facilities for Temeke Municipality																				
Project preparation and mobilisation																				
Initial studies, design and engineering,																				
Project management (includes construction management)																				
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																				
Sewage collection system																				
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads																				
Construction: civil, mechanical, etc., Contingency.																				
Supplies, personnel (hiring and training/capacity building)																				

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L08: Rehabilitation and clean-up of Msimbazi River Basin
- Tan-L10: Safeguarding Nguva River and other rivers in Temeke District
- Tan-L16: Sewage treatment facility Ilala District
- Tan-L29: Urban solid waste collection and processing Ilala District
- Tan-L30: Urban solid waste collection and processing Temeke District

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

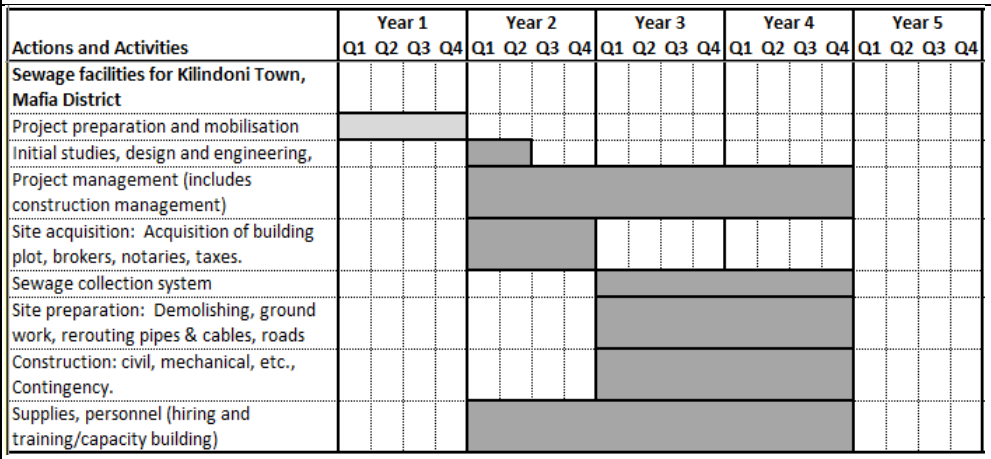
Tan-L18: Sewage collection and treatment facilities for Kilindoni Town, Mafia District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The coastal population has reached its highest and pollution of beaches and the marine environment have reached unprecedented levels. Sources include drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Mafia District's economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade and, increasingly by tourism. Although Mafia ecology offers one of the best diving and snorkeling center in East Africa the number of tourists is still low. This is expected to change dramatically once the 1.4 km Kilindoni jetty is inaugurated, allowing ferries, transporters and tourist vessels to dock with safety. The settlement and built-up portion of Mafia is very small, concentrated in the western district headquarters town of Kilindoni, where the airport and docks are situated. Most remaining villages are within the Mafia Island Marine Park (MIMP). Responding to the recognised need to address waste development and the MIMP General Management Plan (2001) includes recommendations to develop solid waste (and sewage) disposal. With local town inhabitants reliant on informal and inadequate solid waste collection and processing services, large amounts of waste directly enter the natural environment including coastal waters. This affects productivity and tourism potential.
2. Title:	Sewage collection and treatment facilities for Kilindoni town, Mafia District
3. Action Reference:	Tan-L18
4. Justification:	Beach pollution was identified as severity level 3 for Mafia Island, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Marine pollution was ranked as severity level 2. Uncontrolled solid and liquid waste disposal, lack of toilets for public as well as residential houses. Disease outbreaks in Kilindoni was also ranked at severity level 3. Based on 2002 census data, the under five years of age mortality was 176 per 1,000 live births. The projected increase in population accompanied by development tourism, is certain to aggravate the problem of solid waste collection and treatment. The local NGO Seasense, reports that Mafia Island is Tanzania's most important sea turtle nesting site, with over 250 green turtle nests laid each year, and the critically endangered hawksbill turtle is also known to nest on the tiny islands around Mafia. A small but developing sea turtle ecotourism initiative is generating much needed income for communities near to the nesting beaches and is helping to raise awareness of the importance of sea 2 of 3 turtle conservation. However, nesting beaches are on the east coast of the island and are continually covered in large amounts of plastic waste that washes in on the east African current from as far away as Indonesia and the Philippines. The amount of plastic debris on the nesting beaches poses a significant threat to sea turtles in Mafia and also threatens the long term sustainability of the ecotourism project. Complaints from visitors are becoming increasingly common.

	Mafia Island is part of the Mafia-Rufiji-Kilwa Ramsar Site, was in late 2004 formally gazetted under the Ramsar Convention as an 'Area of Wetlands of Global Importance', and referred to as the Rufiji-Mafia-Kilwa Marine Ramsar Site. The island, together with the Rufiji Delta and neighbouring Songo Songo Archipelago (Kilwa District) was identified during a WWF process (2004) as having globally important biodiversity richness within the Eastern African Marine Ecoregion, and was the focus of the WWF Rufiji-Mafia-Kilwa Seascape Programme (or RUMAKI), that ended in 2010. The internationally recognised importance in terms of marine and coastal biodiversity gives added justification for comprehensively addressing the issue of solid (and other) wastes.
5. Objective:	By 2025 at least 80% of Kilindoni Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Kilindoni Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes. 4) Sewage collection system 5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads 6) Construction: civil, mechanical, etc., Contingency. 7) Supplies, personnel (hiring and training/capacity building)
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.
9. Risks:	Local residents and businesses may object and manage to block the project.
10. Means of implementation:	Logistics, technical, scientific: • Budgets for meetings • Budgets for technical assistance • Access to information Green-green infrastructure • … Human Resources: • Project managers • Civil and water engineers • Spatial planners

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Initial studies, design and engineering,	200,000
Project management (includes construction management)	1,000,000
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.	-
Installation of sewage collection system	10,000,000
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads	1,000,000
Construction: civil, mechanical, etc., Contingency.	15,000,000
Supplies, personnel (hiring and training/capacity building)	2,000,000
Total	24,300,000

	The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts. • Contractors • Mafia Island Marine Park • etc…
14. Beneficiary from the action:	Local residents (tens of thousands) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L24: Safe toilet facilities for Bwejuu and Jibondo islands, Mafia District • Tan-L31: Urban solid waste treatment facility Kilindoni Town, Mafia District
17. Performance indicators:	• Water quality (chemistry, BOD, etc.) • Volumes and types of solid wastes on associated beaches • Households connected to sewerage system
18. Comments:	

Tan-L19: Sewage collection and treatment facilities for Kilwa Kivinje, Kilwa District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there are no reports of high nutrient and faecal coliform bacteria levels in waters off Kilwa Kivinje coastal waters, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, drifting north to the Ramsar site (that includes the Songo Songo Archipelago).
2. Title:	Sewage collection and treatment facilities for Kilwa Kivinje town, Kilwa District
3. Action Reference:	Tan-L19
4. Justification:	Beach and marine pollution were both identified as severity level 2 for Kilwa District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over households in Kilwa Kivinje Town (tens of thousands) causes beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres into the Songo Songo Archipelago (Ramsar site), likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Kilwa Kivinje Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Kilwa Kivinje Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.

<table>
<tr><td></td><td colspan="2">4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>10,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>10,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (tens of thousands) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1				Year 2				Year 3				Year 4				Year 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sewage facilities for Kilwa Kivinje Town																				
Project preparation and mobilisation																				
Initial studies, design and engineering,																				
Project management (includes construction management)																				
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																				
Sewage collection system																				
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads																				
Construction: civil, mechanical, etc., Contingency.																				
Supplies, personnel (hiring and training/capacity building)																				

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L20: Sewage waste treatment facility Kilwa Masoko Town
- Tan-L32: Urban solid waste collection and processing facility for Kilwa Kivinje
- Tan-L33: Urban solid waste collection and processing facility for Kilwa Masoko

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

Tan-L20: Sewage collection and treatment facilities for Kilwa Masoko, Kilwa District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there are no reports of high nutrient and faecal coliform bacteria levels in waters off Kilwa Kivinje coastal waters, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, drifting north to the Ramsar site (that includes the Songo Songo Archipelago).
2. Title:	Sewage collection and treatment facilities for Kilwa Masoko town, Kilwa District
3. Action Reference:	Tan-L20
4. Justification:	Beach and marine pollution were both identified as severity level 2 for Kilwa District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over households in Kilwa Masoko Town (tens of thousands) causes beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres into the Songo Songo Archipelago (Ramsar site), likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Kikwa Masoko Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Kilwa Masoko Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering,

<table>
<tr><td></td><td colspan="2">2) Project management (includes construction management)
3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.
4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>10,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>10,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (tens of thousands) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1				Year 2				Year 3				Year 4				Year 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sewage facilities for Kilwa Masoko Town																				
Project preparation and mobilisation																				
Initial studies, design and engineering,																				
Project management (includes construction management)																				
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.																				
Sewage collection system																				
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads																				
Construction: civil, mechanical, etc., Contingency.																				
Supplies, personnel (hiring and training/capacity building)																				

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L19: Sewage waste treatment facility Kilwa Kivinje Town
- Tan-L32: Urban solid waste collection and processing facility for Kilwa Kivinje
- Tan-L33: Urban solid waste collection and processing facility for Kilwa Masoko

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

Tan-L21: Sewage collection and treatment facilities for Lindi town, Lindi Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there is no evidence of high nutrient and faecal coliform bacteria levels in waters off Lindi town, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment.
2. Title:	Sewage collection and treatment facilities for Lindi town, Lindi Urban District
3. Action Reference:	Tan-L21
4. Justification:	Beach pollution was identified as severity level 2 for Lindi Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over households in Lindi Urban town (tens of thousands) causes beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres coastal waters, likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Lindi Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Lindi Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes. 4) Sewage collection system

<table>
<tr><td></td><td colspan="2">5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>10,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>10,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (tens of thousands) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1 Q1 Q2 Q3 Q4	Year 2 Q1 Q2 Q3 Q4	Year 3 Q1 Q2 Q3 Q4	Year 4 Q1 Q2 Q3 Q4	Year 5 Q1 Q2 Q3 Q4
Sewage facilities for Lindi Town					
Project preparation and mobilisation					
Initial studies, design and engineering,					
Project management (includes construction management)					
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.					
Sewage collection system					
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads					
Construction: civil, mechanical, etc., Contingency.					
Supplies, personnel (hiring and training/capacity building)					

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L2: Seawage waste treatment facility Mikindani Town
- Tan-L35: Urban solid waste collection and processing facility for Mikindani and Mtwara towns

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

Tan-L22: Sewage collection and treatment facilities for Mikindani town, Mtwara Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there are no reports of high nutrient and faecal coliform bacteria levels in waters off Mikindani coastal waters, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, potentially affecting the Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP).
2. Title:	Sewage collection and treatment facilities for Mikindani town, Mtwara Urban District
3. Action Reference:	Tan-L22
4. Justification:	Beach pollution was both identified as severity level 4 for Mtwara Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over households in Mtwara Urban Town (tens of thousands) enters the marine environment continuously, at low levels, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease, ranked at severity level 2. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Mikindani Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Mikindani Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering

<table>
<tr><td></td><td colspan="2">1) Initial studies, design and engineering,
2) Project management (includes construction management)
3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.
4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>10,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>10,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1 Q1 Q2 Q3 Q4	Year 2 Q1 Q2 Q3 Q4	Year 3 Q1 Q2 Q3 Q4	Year 4 Q1 Q2 Q3 Q4	Year 5 Q1 Q2 Q3 Q4
Sewage facilities for Mikindani Town					
Project preparation and mobilisation					
Initial studies, design and engineering,					
Project management (includes construction management)					
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.					
Sewage collection system					
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads					
Construction: civil, mechanical, etc., Contingency.					
Supplies, personnel (hiring and training/capacity building)					

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L23: Sewage waste treatment facility Mtwara Town
- Tan-L35: Urban solid waste collection and processing facility for Mikindani and Mtwara towns

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

Tan-L23: Sewage collection and treatment facilities for Mtwara town, Mtwara Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there are no reports of high nutrient and faecal coliform bacteria levels in waters off Mtwara coastal waters, despite there being no sewage treatment system other that simple soak-aways. Low level but constant sewage and nutrient seepage into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, potentially affecting the Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP).
2. Title:	Sewage collection and treatment facilities for Mtwara town, Mtwara Urban District
3. Action Reference:	Tan-L23
4. Justification:	Beach pollution was both identified as severity level 4 for Mtwara Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Sewage from over households in Mtwara Urban Town (tens of thousands) enters the marine environment continuously, at low levels, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease, ranked at severity level 2. The absence of a suitable sewage collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of Mtwara Town households connected to sewage collection and treatment system.
6. Expected outputs:	The outputs of the action to upgrade the sewage system of the Mtwara Town are: • Fully operational sewage treatment plants where appropriate. • Effective and sustainable sewage collection systems in place. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering,

<table>
<tr><td></td><td colspan="2">2) Project management (includes construction management)
3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.
4) Sewage collection system
5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads
6) Construction: civil, mechanical, etc., Contingency.
7) Supplies, personnel (hiring and training/capacity building)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Spatial planners
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>1,000,000</td></tr>
<tr><td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Installation of sewage collection system</td><td>10,000,000</td></tr>
<tr><td>Site preparation: Demolishing, ground work, rerouting pipes & cables, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>10,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr>
<tr><td>Total</td><td>24,300,000</td></tr>
</table>
The coarse budget does not provide for land acquisition for the facility (5-10 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (tens of thousands) plus foreign visitors (several thousand) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1 Q1 Q2 Q3 Q4	Year 2 Q1 Q2 Q3 Q4	Year 3 Q1 Q2 Q3 Q4	Year 4 Q1 Q2 Q3 Q4	Year 5 Q1 Q2 Q3 Q4
Sewage facilities for Mtwara Town					
Project preparation and mobilisation					
Initial studies, design and engineering,					
Project management (includes construction management)					
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.					
Sewage collection system					
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads					
Construction: civil, mechanical, etc., Contingency.					
Supplies, personnel (hiring and training/capacity building)					

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S02: Spatial Planning
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to:

- Tan-L22: Seawage waste treatment facility Mikindani Town
- Tan-L35: Urban solid waste collection and processing facility for Mikindani and Mtwara towns

17. Performance indicators:

- Water quality (chemistry, BOD, etc.)
- Volumes and types of solid wastes on associated beaches
- Households connected to sewerage system

18. Comments:

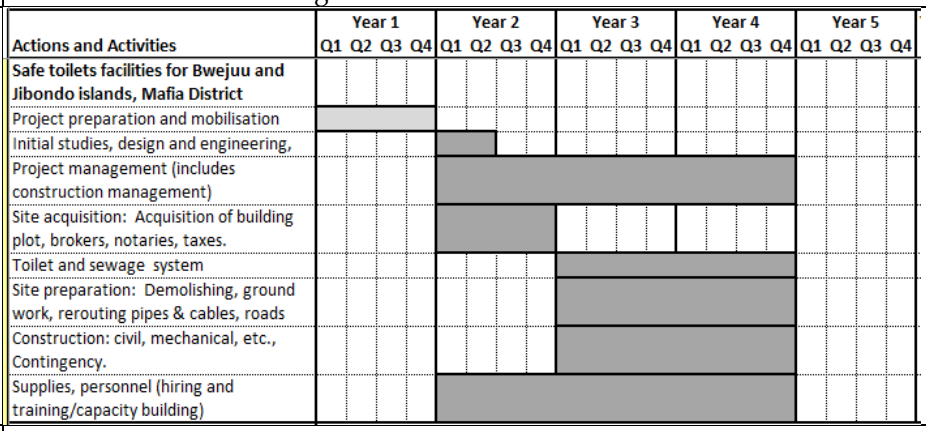
Tan-L24: Safe toilet facilities for Bwejuu and Jibondo islands, Mafia District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Mafia District's economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade and, increasingly by tourism. Although Mafia ecology offers one of the best diving and snorkeling center in East Africa the number of tourists is still low. This is expected to change dramatically once the 1.4 km Kilindoni jetty is inaugurated, allowing ferries, transporters and tourist vessels to dock with safety. The settlement and built-up portion of Mafia is very small, concentrated in the western district headquarters town of Kilindoni, where the airport and docks are situated. Most of the remaining villages are within the Mafia Island Marine Park (MIMP). Responding to the recognised need to address waste development and the MIMP General Management Plan (2001) includes recommendations to develop solid waste (and sewage) disposal. With local town inhabitants reliant on informal and inadequate solid waste collection and processing services, large amounts of waste directly enter the natural environment including coastal waters. This affects productivity and tourism potential.
2. Title:	Sewage collection and treatment facilities for Bwejuu and Jibondo islands, Mafia District
3. Action Reference:	Tan-L24
4. Justification:	Beach pollution was identified as severity level 3 for Mafia Island, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Marine pollution was ranked as severity level 2. Uncontrolled solid and liquid waste disposal, lack of toilets for public as well as residential houses. Disease outbreaks in Kilondoni was also ranked at severity level 3. Based on 2002 census data, the under five years of age mortality was 176 per 1,000 live births. The projected increase in population accompanied by development tourism, is certain to aggravate the problem of solid waste collection and treatment. The local NGO Seasense, reports that Mafia Island is Tanzania's most important sea turtle nesting site, with over 250 green turtle nests laid each year, and the critically endangered hawksbill turtle is also known to nest on the tiny islands around Mafia. A small but developing sea turtle ecotourism initiative is generating much needed income for communities near to the nesting beaches and is helping to raise awareness of the importance of sea 2 of 3 turtle conservation. However, nesting beaches are on the east coast of the island and are continually covered in large amounts of plastic waste that washes in on the east African current from as far

	away as Indonesia and the Philippines. The amount of plastic debris on the nesting beaches poses a significant threat to sea turtles in Mafia and also threatens the long term sustainability of the ecotourism project. Complaints from visitors are becoming increasingly common. Mafia Island is part of the Mafia-Rufiji-Kilwa Ramsar Site, was in late 2004 formally gazetted under the Ramsar Convention as an 'Area of Wetlands of Global Importance', and referred to as the Rufiji-Mafia-Kilwa Marine Ramsar Site. The island, together with the Rufiji Delta and neighbouring Songo Songo Archipelago (Kilwa District) was identified during a WWF process (2004) as having globally important biodiversity richness within the Eastern African Marine Ecoregion, and was the focus of the WWF Rufiji-Mafia-Kilwa Seascape Programme (or RUMAKI), that ended in 2010. The internationally recognises importance in terms of marine and coastal biodiversity gives added justification for comprehensively addressing the issue of solid (and other) wastes.
5. Objective:	By 2025 at least 80% of Jibondo and Bwejuu households have access to safe toilet system.
6. Expected outputs:	The outputs of the action to install a safe toilet system of the Jibondo and Bwejuu are: • Fully operational toilet system where appropriate. • Clean and safe water in coastal waters. • Reduced sewage wastes discharged to sea. • Reduced wastes and pathogens washed up along the coast. • Local LGA capable of managing sewage system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering, 2) Project management (includes construction management) 3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes. 4) Sewage collection system 5) Site preparation: Demolishing, ground work, rerouting pipes & cables, roads 6) Construction: civil, mechanical, etc., Contingency. 7) Supplies, personnel (hiring and training/capacity building)
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.
9. Risks:	Local residents and businesses may object and manage to block the project.
10. Means of implementation:	Logistics, technical, scientific: • Budgets for meetings • Budgets for technical assistance • Access to information Green-green infrastructure • … Human Resources: • Project managers • Civil and water engineers • Spatial planners • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Initial studies, design and engineering,	200,000
Project management (includes construction management)	500,000
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.	
Toilet and sewage system	2,000,000
Site preparation: Demolishing, ground work, rerouting pipes & cables, roads	1,000,000

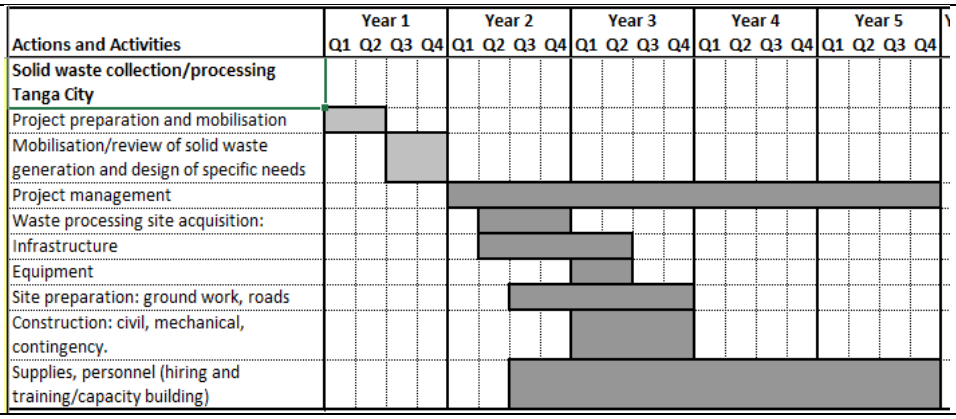
	<table><tr><td>Construction: civil, mechanical, etc., Contingency.</td><td>2,000,000</td></tr><tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>1,000,000</td></tr><tr><td>Total</td><td>6,800,000</td></tr></table> The coarse budget does not provide for land acquisition for the facility (0.5-1.0 acres), re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts. • Contractors • etc…
14. Beneficiary from the action:	Local residents (several thousand) plus foreign visitors (several hundred) in terms of health and safety while swimming in the sea, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sewage pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L15: Sewage collection and treatment facility Kilindoni Town, Mafia District • Tan-L31: Urban solid waste collection and treatment facility Kilindoni Town, Mafia District • Tan-L38: Freshwater supply to Mafia Island Marine Park
17. Performance indicators:	• Water quality (chemistry, BOD, etc.) • Volumes and types of solid wastes on associated beaches • Households connected to sewerage system
18. Comments:	

Tan-L25: Urban Solid Waste Collection and Processing facility for Tanga Town, Tanga Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. A body of literature documents high nutrient and faecal coliform bacteria levels in waters off the Tanga City, discharged through the city sewerage system with only primary screening, and from seepage of sewage into small rivers and streams, directly into the coastal environment, Tanga Bay and western shores of the Pemba Channel. Other forms of waste that are ever present are solid wastes from urban dwellings. Currently there is no evidence of high solid waste levels in waters off the Tanga Town, despite there being no formal solid waste processing facility. Low level but constant waste entry to the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, the western shores of the Pemba Channel and drifting north to the Coelacanth Marine Park.
2. Title:	Urban solid waste collection and processing facility for Tanga Town, Tanga Urban District
3. Action Reference:	Tan-L25
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Tanga Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 5, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The projected increase in population accompanied by development tourism, is certain to aggravate the problem of solid waste collection and treatment.
5. Objective:	By 2025 at least 80% of the households in Tanga Town linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Tanga Town area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Tanga Town area, especially the port.

<table>
<tr><td></td><td colspan="2">2) Project management (includes construction management)
3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.
4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• ..
• ..</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
•</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table><tr><th>Item</th><th>Estimate in USD</th></tr><tr><td>Project preparation and mobilisation</td><td>100,000</td></tr><tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr><tr><td>Project management (includes construction management)</td><td>500,000</td></tr><tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr><tr><td>Infrastructure: Access roads, power supply.</td><td>1,000,000</td></tr><tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr><tr><td>Site preparation: ground work, roads</td><td>1,000,000</td></tr><tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr><tr><td>Supplies, personnel</td><td>1,000,000</td></tr><tr><td>Total</td><td>6,800,000</td></tr></table>The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L01: Rehabilitation and clean-up of four east-flowing rivers in Mkinga District • Tan-L02: Rehabilitation and clean-up of Sigi and Mkulumzi rivers through Tanga Urban and Muheza districts • Tan-L26: Domestic waste treatment facility Pangani Town
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • ..
18. Comments:	

Tan-L26: Urban Solid Waste Collection and Processing facility for Pangani Town, Pangani District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there is no evidence of high solid waste levels in waters off the Pangani town, despite there being no formal solid waste processing facility. Low level but constant waste entry to the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, the western shores of the Pemba Channel and drifting north to the Coelacanth Marine Park.
2. Title:	Urban solid waste collection and processing facility for Pangani Town, Pangani District
3. Action Reference:	Tan-L26
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4 and 2 respectively, for Pangani District, with pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. A formal and efficient solid waste collection and treatment facility is needed before the problem becomes severe.
5. Objective:	By 2025 at least 80% of the households in Pangani Town linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Pangani Town area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Pangani Town area. 2) Project management (includes construction management) 3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes. 4) Infrastructure: Access roads, power supply.. 5) Equipment: vehicles, compactors, incinerators, re-cycling.. 6) Site preparation: ground work, cables, roads 7) Construction: civil, mechanical, contingency.

<table>
<tr><td></td><td colspan="2">8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• ..
• ..</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
•</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
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<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,000,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,800,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
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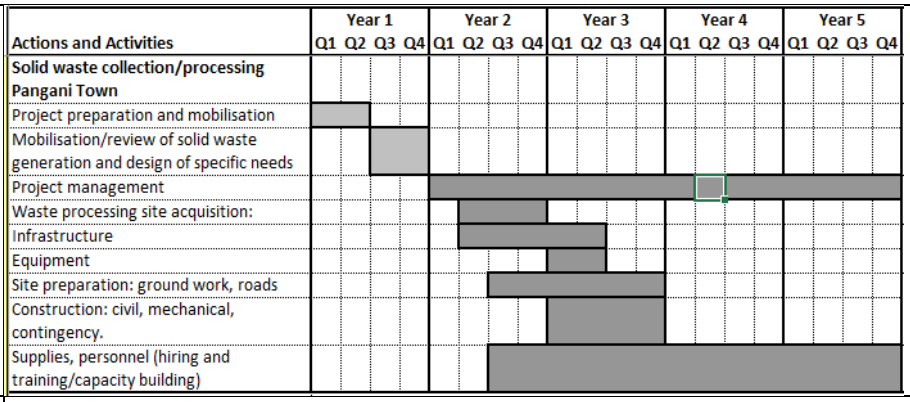
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L12: Sewage collection and treatment facilities for Tanga City • Tan-L13: Sewage collection and treatment facilities for Pangani town, Pangani District • Tan-L25: Urban solid waste treatment facility Tanga City
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • ..
18. Comments:	

Tan-L27: Urban Solid Waste Collection and Processing facility for Bagamoyo Town, Bagamoyo District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there is no evidence of high solid waste levels in waters off Bagamoyo town, despite there being no formal domestic waste treatment systems. Low level but constant of waste into the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more solid waste generated and disposed into small rivers and streams, directly into the coastal environment, the western shores of the Pemba Channel and drifting north to the Saadani National Park.
2. Title:	Urban solid waste collection and processing facility for Bagamoyo Town, Bagamoyo District
3. Action Reference:	Tan-L27
4. Justification:	Beach pollution was both identified as severity level 3 for Bagamoyo District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The district has experienced a high average annual growth rate between 2002 and 2012 of 3.45 % leading to more than 42.30 % increase of the population over the ten-year period and documenting a significant in-migration. The population density in the district has grown to 37 persons/km2 in 2012 from 26 persons/km2 of 2002. Bagamoyo town and surrounding urban and peri-urban areas witness the greatest impacts from increasing population. The absence of a suitable solid waste collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of the households in Bagamoyo Town linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Bagamoyo Town area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Bagamoyo Town area, especially the port. 2) Project management (includes construction management)

<table>
<tr><td></td><td colspan="2">3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.
4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,000,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>2,000,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>2,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,800,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
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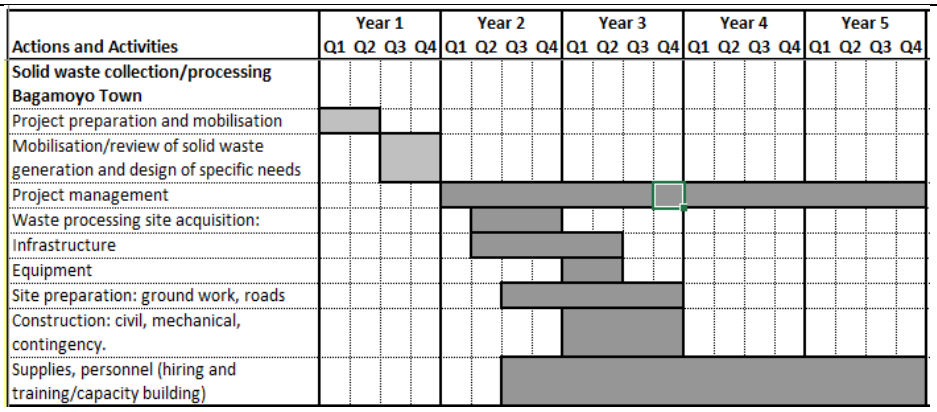
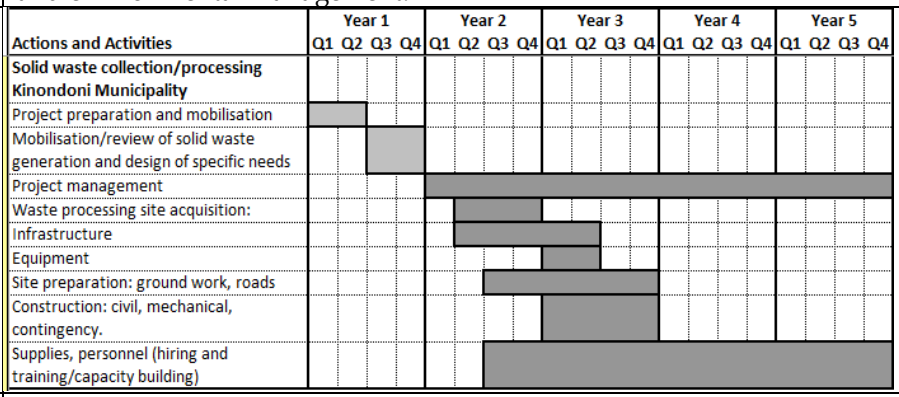
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L05: Rehabilitation and clean-up of Ruvu River Basin • Tan-L14: Sewage collection and treatment facility Bagamoyo Town • Tan-L57: Urban planning for Bagamoyo Town
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

Tan-L28: Urban Solid Waste Collection and Processing facility for Kinondoni Municipality

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Diverse forms of pollution, discharged through local rivers into the coastal environment on the western shores of the Zanzibar Channel, is well-documented, visible especially after heavy rains, with solid wastes and sediments discharged being indicative of degraded and polluted watersheds. These water are important marine biodiversity and fisheries areas, reflected by the presence of the dare s Salaam Marine Reserves (that include the islands and reefs of Bongoyo, Mbudya, Fungu Yasin). Currently there is low level but constant solid waste disposal into the marine environment though not documented. The projected increase in population is likely to be accompanied by more waste entry through small rivers and streams, directly into the coastal environment. The need exists for a comprehensive solid waste treatment facility for inhabitants of Kinondoni.
2. Title:	Urban solid waste collection and processing facility for Kinondoni Municipality
3. Action Reference:	Tan-L28
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Agrochemicals were contributing to marine pollution. Pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Solid waste presently enters the marine environment from seven relatively short-lengthed east-flowing rivers that drain Kinondoni. Together with storm drains, these are some of the largest conduits for liquid and solid waste, chemicals and sediment to the north Dar es Salaam coastline, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. turtles, fish and habitats), extending many kilometres along the coast (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of this important tourist destinations in northern Dar es Salaam. Decline in fisheries yields, regarded as a threat of level 4 in Kinondoni District, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. The absence of a suitable solid waste collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of the households in Kinondoni Municipality linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Kinondoni Municipality area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place.

<table>
<tr><td></td><td colspan="2">• Reduced solid wastes discharged to sea and washed up along the coast.
• Local LGA capable of managing solid waste system.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Kinondoni Municipality area.
2) Project management (includes construction management)
3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.
4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,500,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,500,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>7,800,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal</td></tr>
</table>

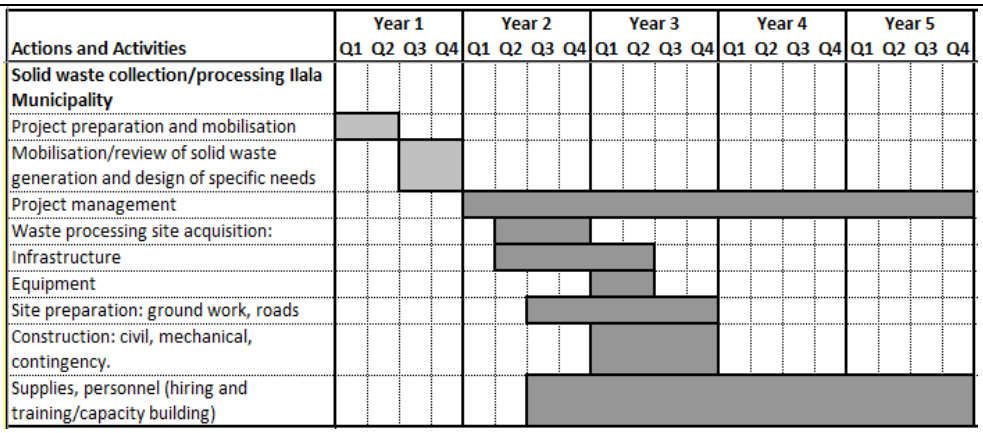
	and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L07: Rehabilitation and clean-up of seven rivers, Kinondoni District • Tan-L15: Sewage treatment facility Kinondoni District • Tan-L29: Urban solid waste collection and processing Ilala District
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • ..
18. Comments:	

Tan-L29: Urban Solid Waste Collection and Processing facility for Ilala Municipality

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Msimbazi Creek is the most studied area of Dar es Salaam (see Tan-L08). Nutrients, chemical, faecal and solid waste pollution discharged through this rivers into the coastal environment as it passes under Selander Bridge, visible especially after heavy rains. Despite there being no sewage treatment system other that simple soak-aways, low level but constant sewage, nutrient and solid waste seepage into the marine environment is taking place. The projected increase in population is likely to be accompanied by greater volumes of solid waste, much of which ends up in small rivers and streams, or directly into the coastal environment.
2. Title:	Urban solid waste collection and processing facility for Ilala Municipality
3. Action Reference:	Tan-L29
4. Justification:	Beach pollution and marine pollution were both identified as severity level 4, for Kinondoni District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Pollution of the beach and nearshore, industrial, sewage and heavy metal were all forms of pollution ranked as level 3 threats in Ilala District. Pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4 in both Kinondoni and Ilala districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 and 3 respectively for Ilala and Kinondoni, with causes linked to flooding and sewage. Establishing an efficnent solid waste collection and treatment facility is the greatest measure to reducing pollution into the coastal waters of Dar es Salaam.
5. Objective:	By 2025 at least 80% of the households in Ilala Municipality linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Ilala Municipality area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Ilala Municipality area, especially the port.

<table>
<tr><td></td><td colspan="2">2) Project management (includes construction management)
3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.
4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,500,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,500,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>7,800,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

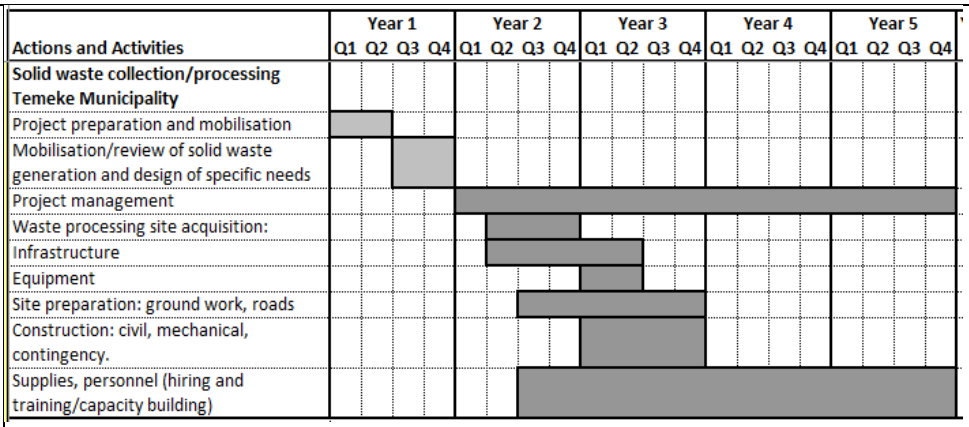
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L05: Rehabilitation and clean-up of Ruvu River Bagamoyo District • Tan-L15: Sewage treatment facility Kinondoni District • Tan-L16: Sewage treatment facility Kinondoni District • Tan-L28: Urban solid waste collection and processing Kinondoni
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

Tan-L30: Urban Solid Waste Collection and Processing facility for Temeke Municipality

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The Dar es Salaam Harbour is the seaward portion of Mzinga Creek, fed by two main tributaries, the Kizinga and Mzinga rivers that drain southern Dar es Salaam. Pollution is well documented, including nutrients, chemicals, oils, faecal and solid waste pollution, that are carried into coastal environment as these waters discharge through Mzinga Creek and pass the Dar es Salaam Port. Low level but constant waste enters the marine environment. The projected increase in population is likely to be accompanied by more seepage of sewage into small rivers and streams, directly into the coastal environment, the western shores of the Zanzibar Channel and drifting into the Dar es Salaam Marine Reserve.
2. Title:	Urban solid waste collection and processing facility for Temeke Municipality
3. Action Reference:	Tan-L29
4. Justification:	Pollution of the beach and nearshore, industrial, sewage and heavy metal were all forms of pollution ranked as level 3 threats in Ilala District. Beach and marine pollution from heavy metals, industrial and oil pollution were all identified as severity level 3, for Temeke District, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems, industry and garages dumping into the Kizinga and Mzinga rivers. Decline in fisheries yields, regarded as a threat of level 4 in both Ilala and Temeke districts, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Disease outbreaks was ranked at severity level 4 for Ilala, with causes linked to flooding and sewage. Installing a complete waste system for Temeke is a high priority.
5. Objective:	By 2025 at least 80% of the households in Temeke Municipality linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Temeke Municipality area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Temeke Municipality area, especially the port. 2) Project management (includes construction management) 3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.

<table>
<tr><td></td><td colspan="2">4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,500,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,500,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>7,800,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several hundreds of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L08: Rehabilitation and clean-up of Msimbazi River Basin • Tan-L10: Safeguarding Nguva River and other rivers in Temeke District • Tan-L16: Sewage treatment facility Ilala District • Tan-L17: Sewage treatment facility Temeke District • Tan-L29: Urban solid waste collection and processing Ilala District
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

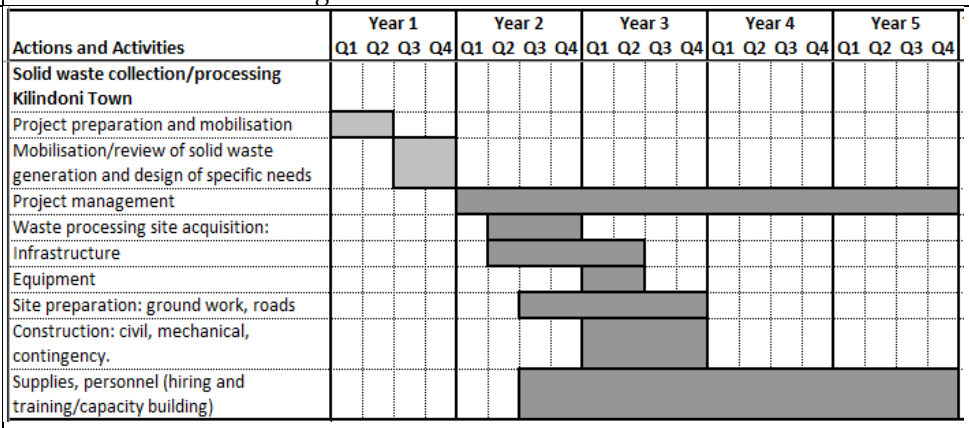
Tan-L31: Urban Solid Waste Collection and Processing facility for Kilindoni, Mafia District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Mafia District's economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade and, increasingly by tourism. Although Mafia ecology offers one of the best diving and snorkelling center in East Africa the number of tourists is still low. This is expected to change dramatically once the 1.4 km Kilindoni jetty is inaugurated, allowing ferries, transporters and tourist vessels to dock with safety. The settlement and built-up portion of Mafia is very small, concentrated in the western district headquarters town of Kilindoni, where the airport and docks are situated. Most of the remaining villages are within the Mafia Island Marine Park (MIMP). Responding to the recognised need to address waste development and the MIMP General Management Plan (2001) includes recommendations to develop solid waste (and sewage) disposal. With local town inhabitants reliant on informal and inadequate solid waste collection and processing services, large amounts of waste directly enter the natural environment including coastal waters. This affects productivity and tourism potential.
2. Title:	Urban solid waste collection and processing facility for Kilindoni, Mafia District
3. Action Reference:	Tan-L31
4. Justification:	Beach pollution was identified as severity level 3 for Mafia Island, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Marine pollution was ranked as severity level 2. Uncontrolled solid and liquid waste disposal, lack of toilets for public as well as residential houses. Disease outbreaks in Kilondoni was also ranked at severity level 3. Based on 2002 census data, the under five years of age mortality was 176 per 1,000 live births. The projected increase in population accompanied by development tourism, is certain to aggravate the problem of solid waste collection and treatment. The local NGO Seasense, reports that Mafia Island is Tanzania's most important sea turtle nesting site, with over 250 green turtle nests laid each year, and the critically endangered hawksbill turtle is also known to nest on the tiny islands around Mafia. A small but developing sea turtle ecotourism initiative is generating much needed income for communities near to the nesting beaches and is helping to raise awareness of the importance of sea 2 of 3 turtle conservation. However, nesting beaches are on the east coast of the island and are continually covered in large amounts of plastic waste that washes in on the east African current from as far away as Indonesia and the Philippines. The amount of plastic debris on the nesting beaches poses a significant threat to sea turtles in Mafia and also threatens

	the long term sustainability of the ecotourism project. Complaints from visitors are becoming increasingly common. Mafia Island is part of the Mafia-Rufiji-Kilwa Ramsar Site, was in late 2004 formally gazetted under the Ramsar Convention as an 'Area of Wetlands of Global Importance', and referred to as the Rufiji-Mafia-Kilwa Marine Ramsar Site. The island, together with the Rufiji Delta and neighbouring Songo Songo Archipelago (Kilwa District) was identified during a WWF process (2004) as having globally important biodiversity richness within the Eastern African Marine Ecoregion, and was the focus of the WWF Rufiji-Mafia-Kilwa Seascape Programme (or RUMAKI), that ended in 2010. The internationally recognises importance in terms of marine and coastal biodiversity gives added justification for comprehensively addressing the issue of solid (and other) wastes.
5. Objective:	By 2025 at least 80% of the households linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Kilindoni town area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Kilindoni town area 2) Project management (includes construction management) 3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes. 4) Infrastructure: Access roads, power supply.. 5) Equipment: vehicles, compactors, incinerators, re-cycling.. 6) Site preparation: ground work, cables, roads 7) Construction: civil, mechanical, contingency. 8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.
9. Risks:	Local residents and businesses may object and manage to block the project.
10. Means of implementation:	Logistics, technical, scientific: • Budgets for meetings • Budgets for technical assistance • Access to information Green-green infrastructure • … Human Resources: • Project managers • Civil and water engineers • Socio-economists, re-settlement specialists.. • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Initial studies, design and engineering,	200,000
Project management (includes construction management)	500,000
Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.	-
Infrastructure: Access roads, power supply.	1,000,000
Equipment: vehicles, compactors, incinerators, re-cycling.	3,000,000

	<table><tr><td>Site preparation: ground work, roads</td><td>1,000,000</td></tr><tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr><tr><td>Supplies, personnel</td><td>1,000,000</td></tr><tr><td>Total</td><td>7,800,000</td></tr></table> The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: • Contractors • etc…
14. Beneficiary from the action:	Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L28: Sewage collection and treatment facility for Kilindoni, Mafia Island
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

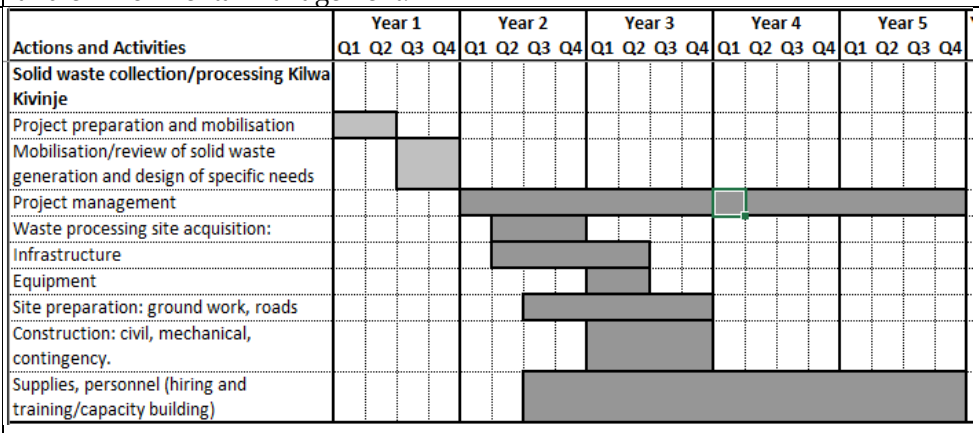
Tan-L32: Urban Solid Waste Collection and Processing facility for Kilwa Kivinje, Kilwa District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Kilwa District's economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade. Kilwa is described as the district with the best fishing grounds in the country and the population is highly dependent on fisheries as a main source of protein and income, mainly from marine sources. The inshore waters off Kilwa District, especially northwards into the Songo Songo Archipelago are relatively shallow and calm, protected by a line of islands and reefs to the east that create ideal conditions for the fishery for small pelagic fish species (sardines and anchovies). Kilwa Kivinje is the most important landing site in the district, with seasonal visiting fishers boosting the number of inhabitants. Tourism is not a major contributor to the economy of Kilwa at present, partly due to difficult and expensive access. When the Kilwa Road construction is finally completed tourism is likely to increase, as the potential is high. The settlement and built-up portion of Kilwa is very small and concentrated in Kilwa Masoko town and Kilwa Kivinje. The districts's population is some 200,000, thought the two later towns accommodate the greatest proportion, with Kilwa Kivinje housing an estimated 10,000, though figures are not readily available. With local town inhabitants reliant on informal and inadequate solid waste collection and processing services, large amounts of waste directly enter the natural environment including coastal waters. This affects productivity and tourism potential.
2. Title:	Urban solid waste collection and processing facility for Kilwa Kivinje, Kilwa District
3. Action Reference:	Tan-L32
4. Justification:	Beach pollution and marine pollution were identified as severity level 2 for Kilwa District, notably at Kilwa Kivinje and to a lesser extent at Kilwa Masoko, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Based on 2002 census data, the percentage of the population living below the poverty line in Kilwa was 35 %, the over 15 years of age literacy coverage was only 52 % and under five years of age mortality was 217 per 1,000 live births. There was until recently, very limited industrial activities, but the installation of electricity powered by Songo Songo gas reserves, is expected to boost development. In addition, the projected increase in population, accompanied by the development tourism, is certain to aggravate the problem of solid waste collection and treatment.

	Kilwa is part of the Mafia-Rufiji-Kilwa Ramsar Site, was in late 2004 formally gazetted under the Ramsar Convention as an 'Area of Wetlands of Global Importance', and referred to as the Rufiji-Mafia-Kilwa Marine Ramsar Site. The island, together with the Rufiji Delta and neighbouring Songo Songo Archipelago (Kilwa District) was identified during a WWF process (2004) as having globally important biodiversity richness within the Eastern African Marine Ecoregion, and was the focus of the WWF Rufiji-Mafia-Kilwa Seascape Programme (or RUMAKI), that ended in 2010. The internationally recognises importance in terms of marine and coastal biodiversity gives added justification for comprehensively addressing the issue of solid (and other) wastes.
5. Objective:	By 2025 at least 80% of the households linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Kilwa Kivinje town area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Kilwa Kivinje town area, especially the port. 2) Project management (includes construction management) 3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes. 4) Infrastructure: Access roads, power supply.. 5) Equipment: vehicles, compactors, incinerators, re-cycling.. 6) Site preparation: ground work, cables, roads 7) Construction: civil, mechanical, contingency. 8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.
9. Risks:	Local residents and businesses may object and manage to block the project.
10. Means of implementation:	Logistics, technical, scientific: • Budgets for meetings • Budgets for technical assistance • Access to information Green-green infrastructure • … Human Resources: • Project managers • Civil and water engineers • Socio-economists, re-settlement specialists. • …

11. Budget estimate:

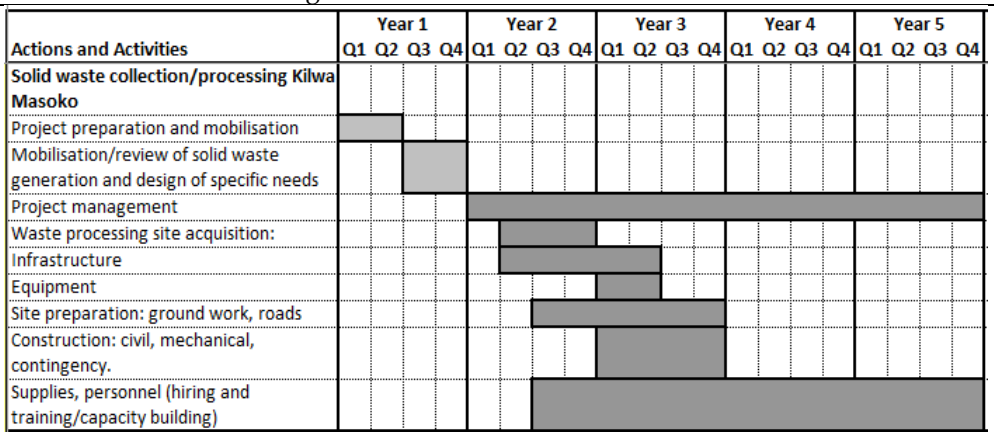
Item	Estimate in USD
Project preparation and mobilisation	100,000
Initial studies, design and engineering,	200,000
Project management (includes construction management)	500,000
Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.	-
Infrastructure: Access roads, power supply.	1,000,000
Equipment: vehicles, compactors, incinerators, re-cycling.	2,000,000
Site preparation: ground work, roads	1,000,000
Construction: civil, mechanical, contingency.	1,000,000
Supplies, personnel	1,000,000

	Total 6,800,000 The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: • Contractors • etc…
14. Beneficiary from the action:	Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L19: Sewage collection and treatment facility for Kilwa Kivinje • Tan-L20: Sewage collection and treatment facility for Kilwa Masoko • Tan-L33: Urban solid waste collection and processing facility, Kilwa Masoko
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

Tan-L33: Urban Solid Waste Collection and Processing facility for Kilwa Masoko, Kilwa District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Kilwa District's economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade. Kilwa is described as the district with the best fishing grounds in the country and the population is highly dependent on fisheries as a main source of protein and income, mainly from marine sources. The inshore waters off Kilwa District, especially northwards into the Songo Songo Archipelago are relatively shallow and calm, protected by a line of islands and reefs to the east that create ideal conditions for the fishery for small pelagic fish species (sardines and anchovies). Kilwa Masoko is the second most important landing site in the district, with seasonal visiting fishers boosting the number of inhabitants. Tourism is not a major contributor to the economy of Kilwa at present, partly due to difficult and expensive access. When the Kilwa Road construction is finally completed tourism is likely to increase, as the potential is high. The settlement and built-up portion of Kilwa is very small and concentrated in Kilwa Masoko town and Kilwa Kivinje. The districts's population is some 200,000, thought the two later towns accommodate the greatest proportion, with Kilwa Masoko housing an estimated 10,000, though figures are not readily available. With local town inhabitants reliant on informal and inadequate solid waste collection and processing services, large amounts of waste directly enter the natural environment including coastal waters. This affects productivity and tourism potential.
2. Title:	Urban solid waste collection and processing facility for Kilwa Masoko, Kilwa District
3. Action Reference:	Tan-L32
4. Justification:	Beach pollution and marine pollution were identified as severity level 2 for Kilwa District, notably at Kilwa Kivinje and to a lesser extent at Kilwa Masoko, with sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Based on 2002 census data, the percentage of the population living below the poverty line in Kilwa was 35 %, the over 15 years of age literacy coverage was only 52 % and under five years of age mortality was 217 per 1,000 live births. There was until recently, very limited industrial activities, but the installation of electricity powered by Songo Songo gas reserves, is expected to boost development. In addition, the projected increase in population, accompanied by the development tourism, is certain to aggravate the problem of solid waste collection and treatment. Kilwa is part of the Mafia-Rufiji-Kilwa Ramsar Site, was in late 2004 formally gazetted under the Ramsar Convention as an 'Area of Wetlands of Global

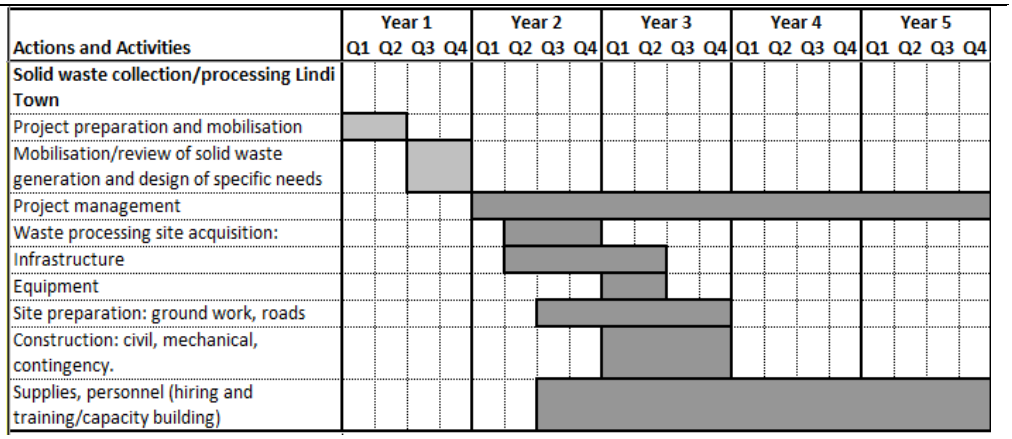
<table>
<tr><td></td><td>Importance', and referred to as the Rufiji-Mafia-Kilwa Marine Ramsar Site. The island, together with the Rufiji Delta and neighbouring Songo Songo Archipelago (Kilwa District) was identified during a WWF process (2004) as having globally important biodiversity richness within the Eastern African Marine Ecoregion, and was the focus of the WWF Rufiji-Mafia-Kilwa Seascape Programme (or RUMAKI), that ended in 2010. The internationally recognises importance in terms of marine and coastal biodiversity gives added justification for comprehensively addressing the issue of solid (and other) wastes.</td></tr>
<tr><td>5. Objective:</td><td>By 2025 at least 80% of the households in Kilwa Masoko linked to a solid waste collection and processing facility.</td></tr>
<tr><td>6. Expected outputs:</td><td>The outputs of the action to install a solid waste collection and processing facility serving Kilwa Masoko town area are:
• Fully operational solid waste collection and processing plant.
• Effective and sustainable solid collection systems in place.
• Reduced solid wastes discharged to sea and washed up along the coast.
• Local LGA capable of managing solid waste system.</td></tr>
<tr><td>7. Activities:</td><td>a) Project design and appraisal.
b) Project tendering
1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Kilwa Masoko town area, especially the port.
2) Project management (includes construction management)
3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.
4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td>The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td>Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td>10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td></td><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,000,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,800,000</td></tr>
</table></td></tr>
</table>

	The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: • Contractors • etc…
14. Beneficiary from the action:	Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L19: Sewage collection and treatment facility for Kilwa Kivinje • Tan-L20: Sewage collection and treatment facility for Kilwa Masoko • Tan-L32: Urban solid waste collection and processing facility, Kilwa Kivinje
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

Tan-L34: Urban Solid Waste Collection and Processing facility for Lindi Town, Lindi Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there is no evidence of high solid waste levels in waters off Lindi town, despite there being no efficient solid waste collections and treatment system. Low level but constant waste entry to the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by greater generation of solid waste with disposal into small rivers and streams, or directly into the coastal environment.
2. Title:	Urban solid waste collection and processing facility for Lindi Town, Lindi Urban District
3. Action Reference:	Tan-L34
4. Justification:	Beach pollution was identified as severity level 2 for Lindi Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Solid waste from over ten thousand inhabitants in Lindi Urban town causes beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres coastal waters, likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease. The absence of a suitable solid waste collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of the households in Lindi Town linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Lindi Town area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Lindi Town area, especially the port. 2) Project management (includes construction management) 3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes. 4) Infrastructure: Access roads, power supply.. 5) Equipment: vehicles, compactors, incinerators, re-cycling..

<table>
<tr><td></td><td colspan="2">6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• …</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,000,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,800,000</td></tr>
</table>
coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.
Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L21: Sewage collection and treatment facility for Lindi Town
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • …
18. Comments:	

Tan-L35: Urban Solid Waste Collection and Processing facility for Mikindani-Mtwara towns, Mtwara Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Currently there are no reports of high nutrient and faecal coliform bacteria levels in waters off Mikindani or Mtwara coastal waters, despite there being no efficient solid waste collection and treatment facility. Low level but constant solid waste entry to the marine environment is likely taking place though not documented. The projected increase in population in this important coastal town is likely to be accompanied by more waste dumped into small rivers and streams, directly into the coastal environment, potentially affecting the Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP).
2. Title:	Urban solid waste collection and processing facility for Mikindani-Mtwara towns, Mtwara Urban District
3. Action Reference:	Tan-L34
4. Justification:	Beach pollution was both identified as severity level 4 for Mtwara Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries yields, regarded as a threat of level 4, is also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the catchments that drain into these coastal habitats. Solid waste from Mtwara Urban (tens of thousands) enters the marine environment continuously, at low levels, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists) and marine life (e.g. fish and habitats), extending many kilometres and resulting in negative publicity to the city. Sewage and water are also responsible for water-borne disease, ranked at severity level 2. The absence of a suitable solid waste collection and treatment facility will over time lead to greater pollution and health issues if not addressed.
5. Objective:	By 2025 at least 80% of the households in Mikindani-Mtwara towns linked to a solid waste collection and processing facility.
6. Expected outputs:	The outputs of the action to install a solid waste collection and processing facility serving Mikindani-Mtwara towns area are: • Fully operational solid waste collection and processing plant. • Effective and sustainable solid collection systems in place. • Reduced solid wastes discharged to sea and washed up along the coast. • Local LGA capable of managing solid waste system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with processing facility: review and develop existing solid waste system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a solid waste master plan for Mikindani-Mtwara towns area, especially the port. 2) Project management (includes construction management)

<table>
<tr><td></td><td colspan="2">3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.
4) Infrastructure: Access roads, power supply..
5) Equipment: vehicles, compactors, incinerators, re-cycling..
6) Site preparation: ground work, cables, roads
7) Construction: civil, mechanical, contingency.
8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the clean-up of the urban and natural environment. Local residents and businesses are supportive of initiatives to clean-up their urban environment.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to information Green-green infrastructure
• ..
• ..</td></tr>
<tr><td>Human Resources</td><td>• Project managers
• Civil and water engineers
• Socio-economists, re-settlement specialists..
•</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Initial studies, design and engineering,</td><td>200,000</td></tr>
<tr><td>Project management (includes construction management)</td><td>500,000</td></tr>
<tr><td>Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</td><td>-</td></tr>
<tr><td>Infrastructure: Access roads, power supply.</td><td>1,000,000</td></tr>
<tr><td>Equipment: vehicles, compactors, incinerators, re-cycling.</td><td>2,000,000</td></tr>
<tr><td>Site preparation: ground work, roads</td><td>1,000,000</td></tr>
<tr><td>Construction: civil, mechanical, contingency.</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,800,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several tens of thousands) in terms of health and safety, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced solid waste pollution entering the inshore coastal waters.

Indirect or long term beneficiaries will be the coastal populations at large that through improved coastal water quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
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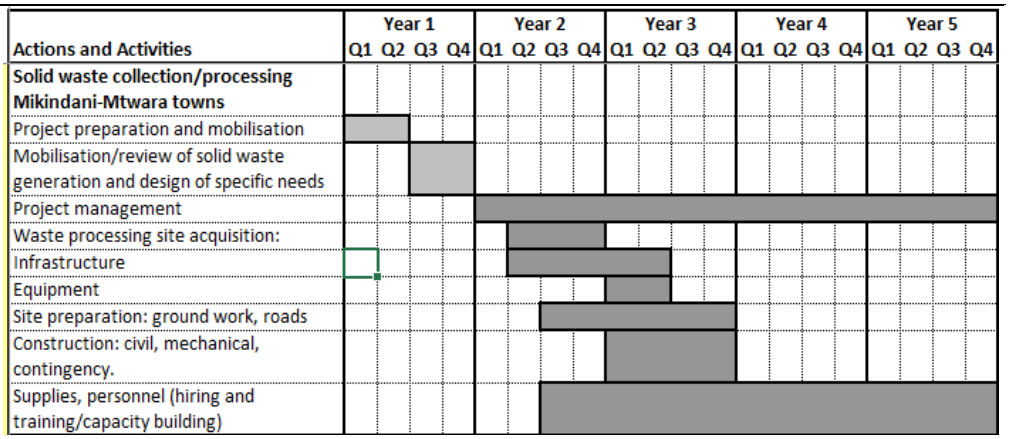
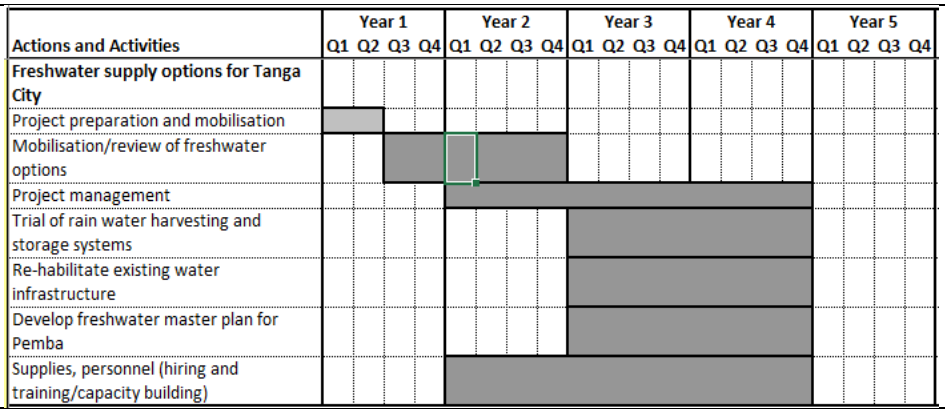
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S02: Spatial Planning • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to: • Tan-L22: Seawage waste treatment facility Mikindani Town • Tan-L22: Seawage waste treatment facility Mtwara Town • Tan-L35: Urban solid waste collection and processing facility for Mikindani and Mtwara towns
17. Performance indicators:	• Water quality (solid wastes, etc.) • Volumes and types of solid wastes on associated beaches • ..
18. Comments:	

Tan-L36: Study, review and design of freshwater supply options for Tanga Town, Tanga Urban District

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities. The population of the coast has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, sewers, illegal dumping and rivers. The average rainfall for Tanga is 1,212 mm (ranging from 644 mm to 1,963 mm). The population stands at 270,000 and increases at about 1.3 % annually. Freshwater is supplied by the Sigi River which is experiencing decreasing flows due to many factors include abstraction for Muheza and agriculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. A comprehensive study is needed to ascertain the freshwater supply options for Tanga Town before the shortages become acute.
2. Title:	Review and update of freshwater supply options for Tanga Town, Tanga Urban District
3. Action Reference:	Tan-L36
4. Justification:	For Tanga District, water shortages were ranked as a threat of severity level 2, a situation made more pertinent by the uncertainties of climate change impacts. Reasons given include forest clearing for agricultural purposes, burning charcoal and shifting cultivation. Rainfall, with its current supply and usage, cannot meet local demands. Demand from population and economic growth is expected to increase significantly in the coming years. Impacts on climate change have as yet uncertain effects on the groundwater supplies and rainfall.
5. Objective:	By 2025 at least 80% of the households in Tanga Urban with secure freshwater supply.
6. Expected outputs:	The outputs of the action to study, review and design of supply options for on Tanga Townare: • Updated understanding of the freshwater supply options and conditions of these sources (aquifers, rivers, rainfall) • Identification and understanding of areas where seawater intrusion is taking place • Definition of the areas where safe and reliable freshwater supplies (with combined sources) can be established with consolidation of "water committees" • Trial of rain harvesting and storage systems using alternative technology • Reduced contamination of rivers and aquifers • Reduced loss of freshwater
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with supplying freshwater to the populations in the larger villages and town of Tanga (or where water supply is most problematic), through review of needs and identification of source options 2) Develop capacity in freshwater supply including from a range of sources 3) Review and develop existing freshwater supply infrastructure and re-habilitate where appropriate 4) Develop, review and implement a freshwater master plan for Tanga Town.

<table>
<tr><td></td><td colspan="2">5) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing freshwater usage in Tanga Town.
6) Trial a number of alternative supply systems (rain harvesting, boreholes, wells, river dams) where appropriate</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the provision of clean and reliable drinking water to the population of Tanga Town. Local residents and businesses are supportive of initiatives to improve their environment and supply of freshwater.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Green-green infrastructure,
• IWRM planning
• Drilling and borehole/well sampling equipment
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Pollution chemists
• Socio-economists
• Alternative energy specialists
• Rain harvesting experts</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation/review of freshwater options</td><td>200,000</td></tr>
<tr><td>Project management</td><td>200,000</td></tr>
<tr><td>Trial of rain water harvesting and storage and supply systems</td><td>1,000,000</td></tr>
<tr><td>Re-habilitate existing water infrastructure</td><td>2,000,000</td></tr>
<tr><td>Develop freshwater master plan for Mafia</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>5,500,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, or handling illegal extractors of freshwater, which are considered a government issue. The budget considers a fixed amount for rehabilitation of existing water supply infrastructure, based on the assumption that beyond that the government would cover cost.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government water development stakeholder capable of effectively coordinating efforts:
• Tanga Urban Water Supply and Sewerage Authority
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (over 40,000), plus thousands of annual tourist visitors) in terms of health and safety, from enhanced and reliable freshwater supply; agriculture activities and natural environment (especially mangrove forest) from improved freshwater.

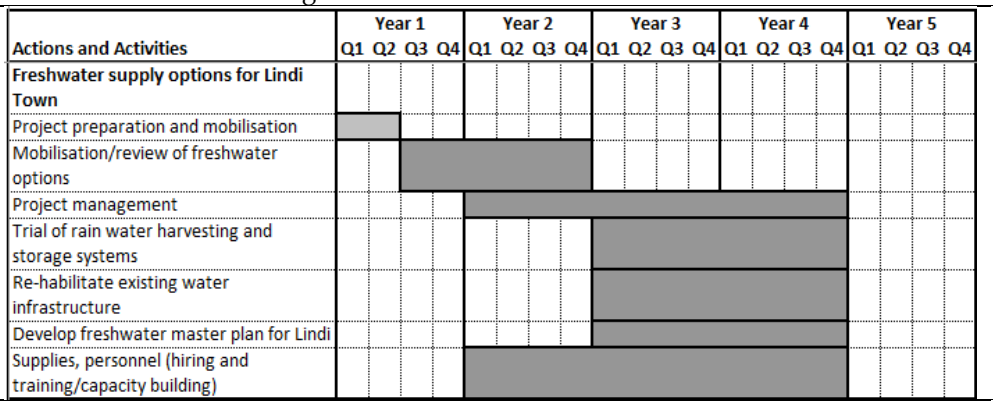
Indirect or long term beneficiaries will be the coastal populations at large that through improved freshwater quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning
17. Performance indicators:	Freshwater quality (chemistry, BOD, etc.), volumes and supply rates.
18. Comments:	

Tan-L37: Study, review and design of freshwater supply options for Lindi Town, Lindi Urban District

1. Background:	The population of Lindi Town has reached its highest, at over 40,000, in 2002. Lindi has very little surface water but holds major aquifers that have been the main source of freshwater for town. Lindi receives a relatively low annual rainwater volume (ranging from 489 mm to 1,699 mm) and water supply problems are well-documented for Lindi (e.g. National Water Policy 2002) and threaten livelihoods in future if the supplies and options are not well-understood and secured. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The population of the district is about 200,000, with a negative average annual growth rate between 2002 and 2012 of -1.01 % leading to - 8.82 % decrease of the population over the ten-year period, confirming out-migration. The population density in the district was reduced to 31 persons/km2 in 2012 from 34 persons/km2 in 2002. This situation is visibly changing since electricity and gas exploration have reached the town of Lindi. Development of the gas industry is projected to increase significantly in the coming years with the establishment of a liquefied natural gas (LNG) facility close to Lindi town. Based on 2002 census data, the percentage of the population living below the poverty line was 51 %, the over 15 years of age literacy coverage was 53 % and under five years of age mortality was 220 per 1,000 live births.
2. Title:	Review and update of Freshwater supply options for Lindi Town, Lindi Urban District
3. Action Reference:	Tan-L37
4. Justification:	For Lindi District, water shortages were ranked as a threat of severity level 4, a situation made more pertinent by the uncertainties of climate change impacts. Reasons given include forest clearing for agricultural purposes, burning charcoal and shifting cultivation. Rainfall, with its current supply and usage, cannot meet local demands. Demand from population and economic growth is expected to increase significantly in the coming years. Impacts on climate change have as yet uncertain effects on the groundwater supplies and rainfall.
5. Objective:	By 2025 at least 80% of the households with secure freshwater supply.
6. Expected outputs:	The outputs of the action to study, review and design of supply options for on Lindi Townare: • Updated understanding of the freshwater supply options and conditions of these sources (aquifers, rivers, rainfall) for the island • Identification and understanding of areas where seawater intrusion is taking place • Definition of the areas where safe and reliable freshwater supplies (with combined sources) can be established with consolidation of "water committees" • Trial of rain harvesting and storage systems using alternative technology • Reduced contamination of rivers and aquifers • Reduced loss of freshwater
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with supplying freshwater to the populations in the larger villages and town of Lindi (or where water

<table>
<tr><td></td><td colspan="2">supply is most problematic), through review of needs and identification of source options
2) Develop capacity in freshwater supply including from a range of sources
3) Review and develop existing freshwater supply infrastructure and re-habilitate where appropriate
4) Develop, review and implement a freshwater master plan for Lindi Town.
5) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing freshwater usage in Lindi Town.
Trial a number of alternative supply systems (rain harvesting, boreholes, wells, river dams) where appropriate</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the provision of clean and reliable drinking water to the population of Lindi Town. Local residents and businesses are supportive of initiatives to improve their environment and supply of freshwater.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Green-green infrastructure,
• IWRM planning
• Drilling and borehole/well sampling equipment
• …</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Pollution chemists
• Socio-economists
• Alternative energy specialists
• Rain harvesting experts</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation/review of freshwater options</td><td>400,000</td></tr>
<tr><td>Project management</td><td>200,000</td></tr>
<tr><td>Trial of rain water harvesting and storage and supply systems</td><td>1,000,000</td></tr>
<tr><td>Re-habilitate existing water infrastructure</td><td>3,000,000</td></tr>
<tr><td>Develop freshwater master plan for Mafia</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,700,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, or handling illegal extractors of freshwater, which are considered a government issue. The budget considers a fixed amount for rehabilitation of existing water supply infrastructure, based on the assumption that beyond that the government would cover cost.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government water development stakeholder capable of effectively coordinating efforts:
• Lindi Urban Water Supply and Sewerage Authority
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (over 40,000), plus thousands of annual tourist visitors) in terms of health and safety, from enhanced and reliable freshwater supply; agriculture activities and natural environment (especially mangrove forest) from improved freshwater.</td></tr>
</table>

	Indirect or long term beneficiaries will be the coastal populations at large that through improved freshwater quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-L21: Sewage treatment facility Lindi Town • Tan-L34: Urban solid waste collection and processing facility Lindi town
17. Performance indicators:	Freshwater quality (chemistry, BOD, etc.), volumes and supply rates.
18. Comments:	

Tan-L38: Study, review, design and trial freshwater supply options for outlying small islands in the Mafia Island Marine Park, Mafia District

1. Background:	The population of Mafia Island (including smaller islands of Jibondo and Juani) has reached its highest, at over 45,000. The economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade and, increasingly by tourism. Although Mafia ecology offers one of the best diving and snorkeling center in East Africa the number of tourists is still low. This is expected to change dramatically once the 1.4 km Kilindoni jetty is inaugurated, allowing ferries, transporters and tourist vessels to dock with safety. Mafia receives a moderate annual rainwater volume (ranging from 1,479 mm to 2,663 mm), yet freshwater supply is an ever-present, low ranking problem for most of the district, except for a few smaller outlying islands where it is severe. Mafia has few surface water streams but does have aquifers, though these are not well charted. Responding to the recognised need to address freshwater issues the MIMP General Management Plan (2001) acknowledges that "freshwater supplies during the dry season already appears to be under pressure, though no hydrological survey has been undertaken". The GMP also recommends the development of freshwater supply regulations. With local town and village inhabitants reliant on shallow wells, some partly saline seasonally, there are The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Jibondo is Mafia best-known fishing village, about 30 minutes away by boat from Utende village. There is always a water shortage and many of the younger people spend a great deal of time carrying water from sources on the main island. A similar situation exists at Bewjuu Island off the west coast. Both are water-stressed areas. Based on 2002 census data, the percentage of the population living below the poverty line was 43 %, the over 15 years of age literacy coverage was 67 % and under five years of age mortality was 176 per 1,000 live births.
2. Title:	Study, review and design of freshwater supply options and trials for outlying small islands in the Mafia Island Marine Park, Mafia District
3. Action Reference:	Tan-L38
4. Justification:	On Mafia Island, freshwater problems were not highlighted, though disease outbreaks were ranked at severity level 3, especially to the higher concentration areas of Kilindoni, Jibondo Island and Bwejuu Island. The later two islands have no sources of freshwater which has to be sourced from wells on the main island and transported by boat. Impacts on climate change have as yet uncertain effects on the groundwater supplies and rainfall. The lack of documented threat of freshwater availability in the Mafia Island District from the background study should not be seen as a reason to neglect the future needs of freshwater on Mafia and its surrounding islands. The focus of this action is therefore to assess the ground water potential, define solutions for the outlying smaller islands (especially Jibondo and Bewejuu – possibly with water pipe installation) and develop a master plan for the entire district.

	Given the expected growth in population, development and tourism, much of which is associated with the new Kilindoni Jetty facility, and the importance of the MIMP as a tourist destination and marine biodiversity hotspot, the action to improve freshwater supplies is seen as an essential infrastructure development.	
5. Objective:	By 2025 at least 80% of the households with secure freshwater supply.	
6. Expected outputs:	The outputs of the action to study, review and design of supply options for local communities within the MIMP are: • Updated understanding of the freshwater supply options and conditions of these sources (aquifers, rivers, rainfall) for the main island and surrounding smaller islands • Identification and understanding of areas where seawater intrusion is taking place • Definition of the areas where safe and reliable freshwater supplies (with combined sources) can be established with consolidation of "water committees" • Trial of rain harvesting and storage systems using alternative technology • Installation of water pipes to outlying islands • Reduced contamination of rivers and aquifers • Reduced loss of freshwater	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with supplying freshwater to the populations in the larger villages and towns of Mafia (or where water supply is most problematic), through review of needs and identification of source options 2) Develop capacity in freshwater supply including from a range of sources 3) Review and develop existing freshwater supply infrastructure and re-habilitate where appropriate 4) Develop, review and implement a freshwater master plan for Mafia. 5) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing freshwater usage within the MIMP 6) Trial a number of alternative supply systems (rain harvesting, boreholes, wells, river dams, water pipes) where appropriate	
8. Assumptions:	The Tanzania Government is committed to supporting the provision of clean and reliable drinking water to the population of Mafia. Local residents and businesses are supportive of initiatives to improve their environment and supply of freshwater.	
9. Risks:	Local residents and businesses may object and manage to block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Green-green infrastructure, • IWRM planning • Drilling and borehole/well sampling equipment • …
	Human Resources	• Civil and water engineers • Pollution chemists • Socio-economists • Alternative energy specialists • Rain harvesting experts

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Mobilisation/review of freshwater options	400,000
Project management	200,000
Trial of rain water harvesting and storage and supply systems	3,000,000
Re-habilitate existing water infrastructure	2,000,000
Develop freshwater master plan for Mafia	1,000,000
Supplies, personnel (hiring and training/capacity building)	1,000,000
Total	7,700,000

The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, or handling illegal extractors of freshwater, which are considered a government issue. The budget considers a fixed amount for rehabilitation of existing water supply infrastructure, based on the assumption that beyond that the government would cover cost.

12. Source of funding:

- Tanzania Government (budget, participation)
- Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:

Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:

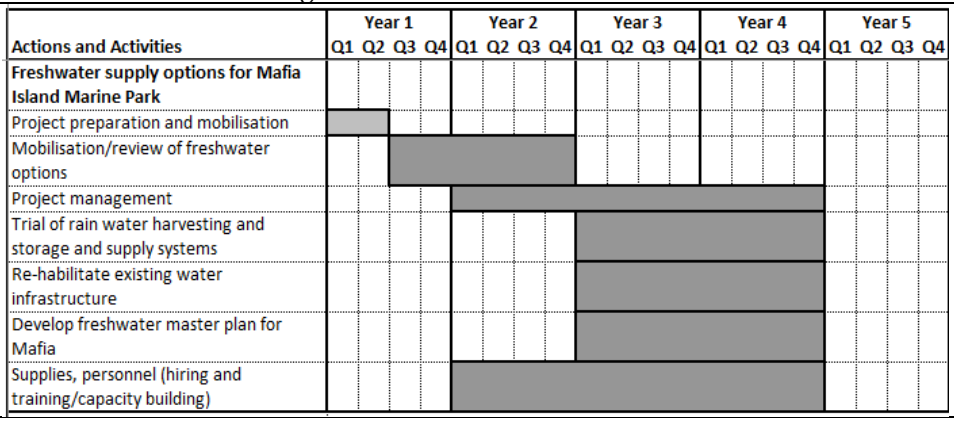
- Contractors
- etc…

14. Beneficiary from the action:

Local residents (over 45,000), plus thousands of annual tourist visitors) in terms of health and safety, from enhanced and reliable freshwater supply; agriculture activities and natural environment (especially mangrove forest) from improved freshwater.

Indirect or long term beneficiaries will be the coastal populations at large that through improved freshwater quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following systemic and local actions:

- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-L28: Sewage collection and treatment facility for Kilindoni, Mafia Island

17. Performance indicators:	Freshwater quality (chemistry, BOD, etc.), volumes and supply rates.
18. Comments:	Two solar desalination units are being piloted for remote communities, one of them on a small island off the Pemba Island coast. Lessons learnt from that initiative would be useful going forward with Tan-L38.

Tan-L39: Study, review, design and trial freshwater supply options for outlying villages in the Mnazi Bay-Ruvuma Estuary Marine Park, Mtwara Rural District

1. Background:	The population of Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP), including smaller islands, has reached its highest, at over 20,000. The economy relies on agricultural cultivation and fisheries, with a substantial amount of revenue also contributed by trade and, increasingly by tourism. Although MBREMP ecology offers one of the best diving and snorkeling center in East Africa the number of tourists is still low. This is expected to change dramatically once the benefits for the recently discovered gas reserves comes to fruition, adding to the local population. Mtwara Rural receives a low annual rainwater volume (ranging from 515 mm to 1,589 mm), with freshwater supply an ever-present, low ranking problem for most of the district, except for a few smaller outlying islands where it is severe, such as in the MBREMP area. There are many water-stressed areas in the MBREMP. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.
2. Title:	Study, review and design and trial freshwater supply options and trials for outlying villages in the MBREMP, Mtwara Rural District
3. Action Reference:	Tan-L39
4. Justification:	The lack of documented threat of freshwater availability in the MBREMP area from the background study should not be seen as a reason to neglect the future needs of freshwater in the park and its surrounding islands. The focus of this action is therefore to assess the ground water potential, define solutions for the general MBREMP area and develop a master plan for the entire park. Given the expected growth in population, development and tourism, much of which is associated with new developments in Mtwara area, and the importance of the MBREMP as a tourist destination and marine biodiversity hotspot, the action to improve freshwater supplies is seen as an essential infrastructure development.
5. Objective:	By 2025 at least 80% of the households in MBREMP with secure freshwater supply.
6. Expected outputs:	The outputs of the action to study, review and design of supply options for local communities within the MBREMP are: • Updated understanding of the freshwater supply options and conditions of these sources (aquifers, rivers, rainfall) for the main island and surrounding smaller islands • Identification and understanding of areas where seawater intrusion is taking place • Definition of the areas where safe and reliable freshwater supplies (with combined sources) can be established with consolidation of "water committees" • Trial of rain harvesting and storage systems using alternative technology • Installation of water pipes to outlying islands • Reduced contamination of rivers and aquifers • Reduced loss of freshwater
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with supplying freshwater to the populations in the larger villages and towns of Mtwara Rural (or where water supply is most problematic), through review of needs and identification of source options

<table>
<tr><td></td><td colspan="2">2) Develop capacity in freshwater supply including from a range of sources
3) Review and develop existing freshwater supply infrastructure and re-habilitate where appropriate
4) Develop, review and implement a freshwater master plan for Mafia.
5) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing freshwater usage within the MBREMP
6) Trial a number of alternative supply systems (rain harvesting, boreholes, wells, river dams, water pipes) where appropriate</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the provision of clean and reliable drinking water to the population of Mafia. Local residents and businesses are supportive of initiatives to improve their environment and supply of freshwater.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Green-green infrastructure,
• IWRM planning
• Drilling and borehole/well sampling equipment
•</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers
• Pollution chemists
• Socio-economists
• Alternative energy specialists
• Rain harvesting experts</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation/review of freshwater options</td><td>400,000</td></tr>
<tr><td>Project management</td><td>200,000</td></tr>
<tr><td>Trial of rain water harvesting and storage and supply systems</td><td>1,000,000</td></tr>
<tr><td>Re-habilitate existing water infrastructure</td><td>3,000,000</td></tr>
<tr><td>Develop freshwater master plan for Mafia</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,700,000</td></tr>
</table>
The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, or handling illegal extractors of freshwater, which are considered a government issue. The budget considers a fixed amount for rehabilitation of existing water supply infrastructure, based on the assumption that beyond that the government would cover cost.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:
• Contractors
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (over 20,000), plus thousands of annual tourist visitors) in terms of health and safety, from enhanced and reliable freshwater supply; agriculture activities and natural environment (especially mangrove forest) from improved freshwater.

Indirect or long term beneficiaries will be the coastal populations at large that through improved freshwater quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:

Actions and Activities	Year 1				Year 2				Year 3				Year 4				Year 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Freshwater supply options for Mnazi Bay Ruvuma Estuary Marine Park																				
Project preparation and mobilisation																				
Mobilisation/review of freshwater options																				
Project management																				
Trial of rain water harvesting and storage systems																				
Re-habilitate existing water infrastructure																				
Develop freshwater master plan for Pemba																				
Supplies, personnel (hiring and training/capacity building)																				

16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following systemic and local actions:

- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management

17. Performance indicators:

Freshwater quality (chemistry, BOD, etc.), volumes and supply rates.

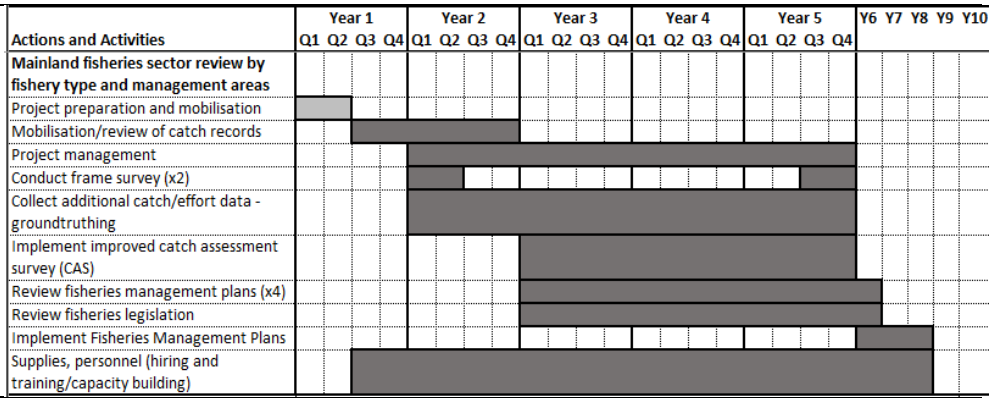
18. Comments:

Two solar desalination units are being piloted for remote communities, one of them on a small island off the Pemba Island coast. Lessons learnt from that initiative would be useful going forward with Tan-L39.

Tan-L40: Tanzania mainland fisheries sector review by fishery type and management areas

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. To give credence to any measures that attempt to manage and even restrict the fishing effort, there is first the need to better understand the main fisheries taking place along the Tanzania mainland coast, especially within and outside of the many marine conservation areas. For mainland Tanzania, fisheries management plans to address the principle four fishery types: octopus, tuna and tuna-like species, small pelagic species (sardine and anchovies), mixed reef fisheries and seaweed farming now exist, having been recently compiled (2012-2013).
2. Title:	Mainland Tanzania fisheries sector review by fishery type and management areas
3. Action Reference:	Tan-L40
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. Linked with potential impacts from climate change, local fisheries are more vulnerable than ever before. The importance of developing fisheries management plans and implementing the results was stressed recently by a SWIOfish consultancy (Groeneveld et al, 2014) who also supported the need to strengthening existing data collection methods as stressed by de Graaf (2013). It was also felt that such a review should include the harmonisation and revision of fisheries legislation in a number of respects, including best practices, consistency with other national legislation and implementation of international obligations, across the various fisheries sub-sectors, including artisanal and semi-industrial fisheries, and regarding vessels that have been fishing in the EEZ but pass through the territorial seas of Tanzania mainland, as highlighted by the recent SWIOfish study of Swan (2013).
5. Objective:	By 2025 the key fishery types sustainably managed and decreased use of destructive gears.
6. Expected outputs:	In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support the fishery review for mainland Tanzania are:

<table>
<tr><td></td><td colspan="2">• Updated understanding of the fishery types (octopus, small pelagic, large pelagic and mixed reef fish) through detailed fisheries management plans
• A review and analysis of long-term datasets and an assessment of their usefulness for fisheries management
• Appropriate and reliable alternative fisheries data collection methods designed
• Assessments of status of stocks and derived effort levels for sustainable yields.
• Assessment and harmonization of fisheries legislation in line with the findings of the fisheries review and recommended fisheries management plans for fishery types
• Local fisheries capacity developed to undertake continued and effective monitoring and management of the main fishery types</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Review and analyse catch records to assess the usefulness of the dataset, and improve data collection protocols
2) Collect additional catch and effort information for ground-truthing
3) Implement improved catch assessment survey (CAS) for two years
4) Revise fisheries management plans for the principle fishery types: octopus, tuna and tuna-like species, small pelagic species and mixed reef fisheries
5) Conduct two modernized and data-integrated frame surveys over next five years
6) Review and revise fisheries legislation in line with marine relevant management plans and conservation areas
7) Capacity building with relevant fisheries institutions and beach recorders</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the improvement of fisheries for the benefit of the population of coastal Tanzania. Local residents and businesses are supportive of initiatives to improve management of the principle fisheries.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to fisheries data/information
…</td></tr>
<tr><td>Human Resources</td><td>• Fisheries scientists (fisheries management, ecology, data management, socio-economists)
• Fisheries trainers
• Master fisherman
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Mobilisation/review of catch records</td><td>100,000</td></tr>
<tr><td>Project management</td><td>200,000</td></tr>
<tr><td>Conduct frame survey (x2)</td><td>500,000</td></tr>
<tr><td>Collect additional catch/effort data - groundtruthing</td><td>200,000</td></tr>
<tr><td>Implement improved catch assessment survey (CAS)</td><td>400,000</td></tr>
<tr><td>Review fisheries management plans (x4)</td><td>400,000</td></tr>
<tr><td>Review fisheries legislation</td><td>200,000</td></tr>
<tr><td>Implement Fisheries Management Plans</td><td>1,000,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>500,000</td></tr>
<tr><td>Total</td><td>3,600,000</td></tr>
</table></td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)</td></tr>
</table>

	• NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts: • Marine Parks and Reserves Unit • Contractors • NGOs • Etc.
14. Beneficiary from the action:	Local coastal residents (above six million) plus foreign visitors (several thousand) in terms of improved reliability of fish, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L41: Small pelagic fisheries support on mainland Tanzania • Tan-L42: Mainland fisheries MCS programme • Tan-L44: Strengthening management of octopus fisheries on mainland Tanzania • Tan-L45: Strengthening seaweed farming on mainland Tanzania • Tan-L46: Tuna fisheries support programme for Mtwara and Lindi Regions • Tan-L47: Prawn fisheries support programme for Rufiji District • Tan-L48: Fish farming research and cage trials in Tanga and Kilwa
17. Performance indicators:	Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.

18. Comments:	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. Seaweed farming is addressed in a specific action (Tan-L44). References cited: de Graaf, G 2013. Rapid Assessment of Fisheries and Aquaculture Information Management System (FIMS) in mainland Tanzania and Zanzibar. First Draft Report. SWIOFish. Groeneveld, JC ,Fennessy, ST, Everett BI and Robey J 2014. Final Report: March 2014 Specialist Report: Rapid Assessment of the State of Commercial Fisheries and Main Species Exploited in Tanzania. Oceanographic Research Institute, Durban. Swan, J 2013. Review of legal and policy framework for fisheries in Tanzania. SWIOFish.

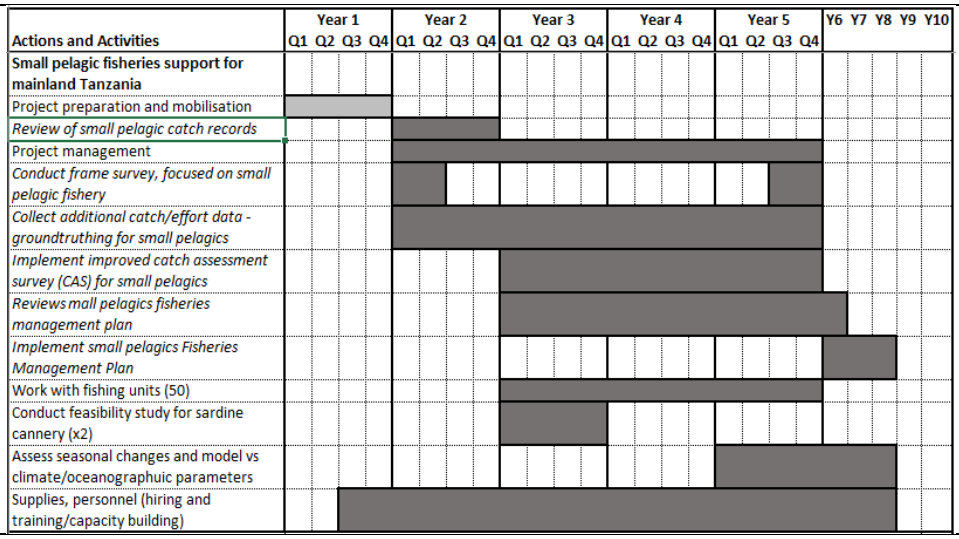
Tan-L41: Small pelagic fisheries support on mainland Tanzania

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. Small pelagics (Clupeids, Scombrids, Engraulids) made up 68% of the marine catch in recent years (Groeneveld et al 2014). Off mainland Tanzaia they are caught off the shores of Tanga, Dar es Salaam and Kilwa, with smaller fishing effort off Mafia, and Mtwara. The Mafia Channel is reputed to be one of the richest, perhaps the richest, small pelagic fishery on the coast. Open water seine nets, purse seine, gill nets, ring / lift nets and migrant fishers are involved that follow fish schools. There is high demand for anchovies as local source of protein, for poultry farming, aquaculture, and also dried and exported. The management effectiveness of the small pelagic fishery is hindered by limited finances available for enforcement, remote areas, large (and growing) numbers of fishers, easy access, and entrenched fishing rights. Post-harvest loss is highest (20% of catch) during the wet season (SE Monsoon), when small pelagic fishes are abundant, but cannot be dried as rapidly or efficiently. Roads are then difficult to navigate, and therefore catches cannot be distributed efficiently during this period, leading to their loss. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The pragmatic outlook on the fisheries sector on mainland Tanzania is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. Although the small pelagic fishery has potential for expansion, and could partly absorb fishers displaced from other fisheries, such as the reef fishery, with declining productivity, or from enforcement of bans of illegal gears, there is an inherent risk associated with promoting a fishery that is not fully understood. Reef fisheries are threatened by over-fishing and environmental disturbance, principally from bleaching episodes (possibly related to anthropogenic climate change). Supporting the small pelagic fishery by better understanding the fishery, by adding value, improving yields, providing a feasibility study for the development of a cannery (for private sector investment) will contribute to its long-term sustainability and contribute towards food security and potentially foreign exchange earnings from export.
2. Title:	Small pelagic fisheries support programme for mainland Tanzania
3. Action Reference:	Tan-L41
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole.

	At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. Linked with potential impacts from climate change, local fisheries are more vulnerable than ever before. It is widely accepted that there is inadequate knowledge on both the fishery and the biology of the pelagic resources (e.g. URT 2013). The productivity of this fisheries is threatened both by over-fishing and by environmental disturbance, principally from bleaching episodes (which may or may not be directly related to anthropogenic climate change). Given the high complexity and natural variability of small pelagic species ecosystems, the lack of data on the fishery and the difficulties in identifying clear potential responses of these fish species to anthropogenic climate change, caution is required by decision-makers who may be tempted to look at this fishery as a go-to fishery that can absorb excess capacity from other fisheries (Anderson, 2014).
5. Objective:	By 2025 the small pelagic fishery is sustainably managed and developments are in place for a sardine cannery.
6. Expected outputs:	In alignment with relevant SWIOfish draft recommendations, the outputs of the Action to support the small pelagic fishery on mainland Tanzania are: • Updated understanding of the fishery • A review and analysis of long-term datasets to assess their usefulness for fisheries management • Develop simple stock status indicators for the most important small pelagics groups • Assess status of stocks and derive effort levels for sustainable yields • Assess long-term dynamics of small pelagic fishery productivity through modelling of catch rates and oceanographic / environmental parameters • Investigate spatial and seasonal trends in fishing patterns along the coast as framework for spatial management of fishing effort • Complete a feasibility study for the establishment of a sardine cannery at Tanga and Kilwa and engage the private sector in its development (if considered viable)
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Review and analyse previous catch data to assess the usefulness of the dataset, and improve data collection protocols. 2) Collect additional catch and effort information for ground-truthing (over 4 years) 3) Implement improved catch assessment survey (CAS) for two years 4) Work with fishing units to install vessel monitoring systems (VMS) to monitor movements, in exchange for e.g. solar lamps and other equipment 5) Assess seasonal changes in species composition; spatiotemporal shifts in fishing effort trends along the coast; and reconstruct total catch from the fishery. 6) Model variability in catch rates and species composition trends relative to long term environmental/oceanographic information (GOOS; NOAA etc.) and plankton conditions to assess the effects of climatic variability on stocks. 8) Develop fisheries management plans to address the small pelagic species fisheries 9) Conduct two modernized and data-integrated frame surveys over next five years to provide accurate data on small pelagic fishery effort 10) Capacity building with relevant fisheries institutions and beach recorders
8. Assumptions:	The Tanzania Government is committed to supporting the improvement of fisheries for the benefit of the population of coastal Tanzania. Local residents

<table>
<tr><td></td><td colspan="2">and businesses are supportive of initiatives to improve their small pelagic fishery.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td>10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to fisheries data/information
• VMS units (x50)
• Solar lamps and ancillary equipment (x100)
..</td></tr>
<tr><td></td><td>Human Resources</td><td>• Fisheries scientists (ecology, data management, socio-economists, economist)
• Business consultants
• ..</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>100,000</td></tr>
<tr><td>Project management</td><td>200,000</td></tr>
<tr><td>Conduct frame survey, focused on small pelagic fishery</td><td>na</td></tr>
<tr><td>Collect additional catch/effort data - groundtruthing for small pelagics</td><td>na</td></tr>
<tr><td>Implement improved catch assessment survey (CAS) for small pelagics</td><td>na</td></tr>
<tr><td>Review small pelagics fisheries management plan</td><td>na</td></tr>
<tr><td>Implement small pelagics Fisheries Management Plan</td><td>500,000</td></tr>
<tr><td>Work with fishing units (50)</td><td>300,000</td></tr>
<tr><td>Conduct feasibility study for sardine cannery (x2)</td><td>200,000</td></tr>
<tr><td>Assess seasonal changes and model vs climate/oceanographuic parameters</td><td>300,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>500,000</td></tr>
<tr><td>Total</td><td>1,700,000</td></tr>
</table>
The coarse budget does not provide for reviewing existing catch data, collecting additional data, frame survey data collection, implementing revised catch assessment nor review of the small pelagic fisheries management plan, provided that these activities are undertaken as part of a separate initiative Tan-L40: Fisheries sector review by fishery type and management areas, with costing for these elements provided.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts:
• Contractors
• TAFIRI, IMS, Mbegani
• NGOs
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (over six million) plus foreign visitors (several thousand) in terms of improved reliability of fish, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters due to increased value added to the small pelagic fishery.

Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-</td></tr>
</table>

	economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L40: Fisheries sector review by fishery types and management areas • Tan-L42: Mainland Tanzania fisheries MCS programme • Tan-L44: Strengthening management of octopus fisheries on mainland Tanzania • Tan-L45: Strengthening seaweed farming on mainland Tanzania • Tan-L46 Tuna fisheries support programme for Mtwara and Lindi Regions • Tan-L47: Prawn fisheries support programme for Rufiji District • Tan-L48: Fish farming research and cage trials in Tanga and Kilwa
17. Performance indicators:	Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.
18. Comments:	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. Particularly, there exists an action in SWIOFish specifically to look at potential value-addition in the small pelagic fishery, including cannery. There could be several potential problems in terms of volumes and marketing hence an economic and market analysis is needed. References: Anderson, J. (in prep). Climate Change and African Coastal Fisheries: Vulnerability Analyses and Recommendations for Fisheries Management Adaptations. Case Study II: Small-Pelagic Fisheries in Tanzania The Known, the Knowable and the Unknowable. Case Studies on Climate Change and Coastal African Fisheries: Small Pelagic Fisheries of Tanzania. 64 pp.

	URT 2013. Management plan for the Tanzanian artisanal fishery for small and medium pelagic fish species. Ministry of Livestock and Fisheries Development. 20 pp.

Tan-L42: Support for mainland Tanzania fisheries MCS programme

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. There is a very week history of enforcement of fisheries regulations in mainland Tanzania. In the past, recommendations have been made to ban destructive fishing practices from marine protected areas, something that has partial success, or the complete elimination of illegal practices. Part of the problem has been confusing and contradictory legislation. Under SWIOfish, recent review have been made with recommendation for implementation. The need to firmly address fisheries control and surveillance on coastal mainland Tanzania has been re-iterated recently by Malan (2014) while working on the SWIOfish study on MCS. The mainland coast of Tanzania does not have strong traditional local governance of fisheries arrangements, though these have strengthened recently by community-based approaches in fisheries through Community Fishermen Committees or CFCs (similar to Beach management Units, or BMUs, as seen on the mainland) in all fishing villages. Whereas the sea is publicly owned and every individual has a user right, marine environments adjacent to any village are gradually and increasingly under the use, interest and monitoring of that village, through the development and strengthening of the BMUs. Such a structure bodes well for MCS at village level.
2. Title:	Support for mainland Tanzania fisheries MCS programme
3. Action Reference:	Tan-L42
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. Linked with potential impacts from climate change, local fisheries are more vulnerable than ever before.

	It is widely accepted that there is insufficient monitoring, control and surveillance of the inshore waters of Tanzania and that destructive and illegal fishing takes place on a large scale. In order to fill that gap, a series of investigations and interventions are needed. The important first step is to ensure that the legislation is clear and non-contradictory and that it is well-known and clearly understood by the fishing community. A second starting point is to register all vessels, gears and fishers, thereby addressing the widely known underestimate of these elements. Malan (2014) quotes interviews with fisheries officials and fishers who suggested that as many as 50% of boats and fishermen may be unlicenced (see Mkenda and Folmer, 2001). Damage to habitats cause loss of spawning and nursery grounds, loss of biodiversity and diminished habitat resilience. Reduction in fisheries productivity due to habitat destruction, can takes years, even centuries to recover.
5. Objective:	By 2025 at least 80% of the fisheries activities comply with regulations.
6. Expected outputs:	In alignment with relevant SWIOfish draft recommendations, the outputs of the action to implement the mainland fisheries MCS programme are divided into two phases: Phase I – within 3 years • All fishers and vessels in selected districts (2 or 3) are registered • All fishing activities for tuna (gill-net) and small pelagic (ring-nets) should have their gears, vessels and fishers registered and licenced • All licenced vessels associated with tuna (gill-net) and small pelagic (ring-net) clearly marked and identifiable • All boat skippers of tuna gill-net and small-pelagic ring-net operations with weatherproof fishing licence • Effective and sustainable management of the tuna and small pelagic fisheries • Reduced entry of non-registered/licenced fishers into the tuna (gill-net) and small pelagic (ring-net) fisheries • Pending review of fisheries legislation in line with marine relevant management plans and conservation areas (see Tan-L42), illegal fisheries such as beach seining in forbidden areas or ring-netting ("kojani") around coral areas is effectively banned within 3 years • A fisheries patrol unit that within two years has established a presence along the mainland coast. • Investigate mechanisms of using a fixed portion of licence fees to fund district offices and CFCs, with emphasis that the funding must be ring-fenced for MCS and fisheries management use - thereby serving as an incentive to ensure that licencing is comprehensive Phase II – within 6 years • All mixed reef fishing activities (using dugout paddle/sail or outrigger canoes) should have their gears, vessels and fishers registered and licenced • All boat skippers of mixed reef fisheries operations with weatherproof fishing licence • All licenced vessels associated with mixed reef fishery clearly marked and identifiable • All octopus fishers registered and licenced with weatherproof fishing licence
7. Activities:	a) Project design and appraisal. b) Project tendering Phase I 1) Pilot project be launched in selected fishing areas, based on four priority fisheries mentioned above (see Tan-L40) for which management plans will have already been developed, beginning with the small pelagic and gill-net

tuna fisheries (first 3 years), and in a second phase expanding to capture the mixed reef and octopus fisheries (within six years)

2) Pilot project expanded to cover entire fishery for tuna and small pelagic species
3) BMUs and district officers used to routinely check that fishers are indeed licenced, with penalties not needing to be draconian, but significant enough to discourage unlicenced fishing, and that licenced boats are clearly marked with a licence number
4) Inspections of catches at landing sites must include checking on the licences
5) Investigate mechanisms of using a fixed portion of licence fees to fund district offices and BMUs. The emphasis being that the funding must be ring-fenced for MCS and fisheries management use. This should act as an incentive to ensure that licencing is comprehensive.
6) The fisheries patrol unit established routine patrols within four years.

Phase II

7) Pilot project expanded to include the mixed reef and octopus fisheries (within six years)
8) Pilot project expanded to cover entire fishery for tuna and small pelagic species
9) BMUs and district officers used to routinely check that fishers are indeed licenced, with penalties that are significant enough to discourage unlicensed fishing, and that licenced boats are clearly marked with a licence number
10) Inspections of catches at landing sites must include checking on the licences

8. Assumptions:

The Tanzania Government is committed to supporting the improvement of fisheries production and enforcement of fisheries legislation, for the benefit of the population coastal Tanzania. Local residents and businesses are supportive of initiatives to improve their fishing industry.

9. Risks:

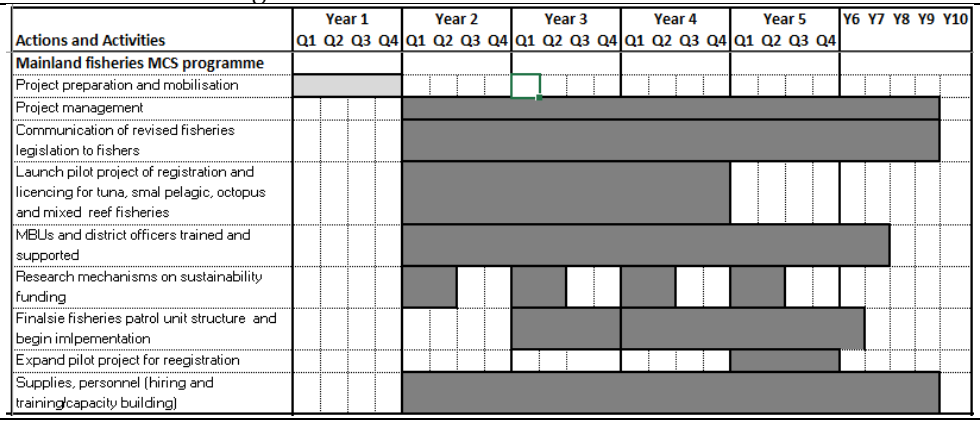
Local fishers and businesses may object and managed to block the project.

10. Means of implementation:

Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Access to fisheries data/information • Licence plates for boats …
Human Resources	• Fisheries scientists (ecology, data management, socio-economists) • MCS expert • Legal expert • Security/fisheries patrol expert (or company) • National security agencies • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Communication of revised fisheries legislation to fishers	50,000
Launch pilot project of registration and licencing for tuna, small pelagic, octopus and mixed reef fisheries	300,000
MBUs and district officers trained and supported	300,000
Research mechanisms on sustainability funding	50,000
Finalise fisheries patrol unit structure and begin implementation	1,000,000
Expand pilot project for registration	1,000,000
Supplies, personnel (hiring and training/capacity building)	2,000,000
Total	**5,000,000**

	The coarse budget does not provide for reviewing and harmonising existing fisheries legislation, provided that activity is undertaken as part of a separate initiative Tan-L40: Mainland Tanzania fisheries sector review by fishery type and management areas. The start of the MCS support programme relies on the completion of the review of relevant fisheries legislation, formalised and made public. Only then can the implementation of the MCS support programme begin. Similarly, the budget does not provide salaries for fisheries or district personnel engaged in their usual job description.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government fisheries development stakeholder (DSFA) capable of effectively coordinating efforts: • Fisheries department • Strong private sector fisheries and/or security entity • District fisheries officers • CFCs • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (over six million) plus foreign visitors (several thousand) in terms of improved reliability of fish, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L40: Fisheries sector review by fishery types and management areas

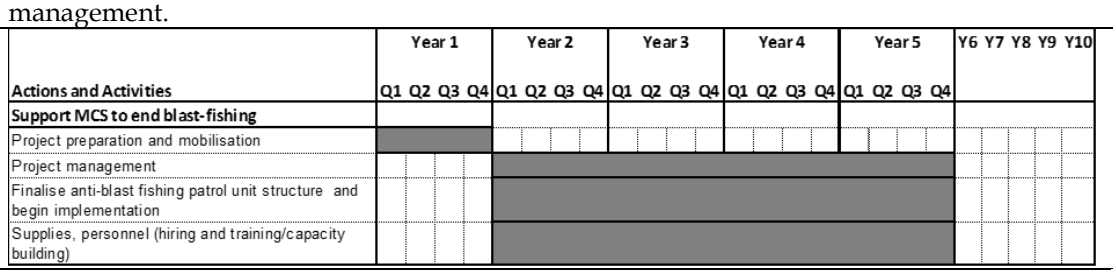
	• Tan-L41: Small pelagic fisheries support on mainland Tanzania • Tan-L43: Support for MCS to end ballast-fishing • Tan-L46: Support for offshore tuna fisheries for Mtwara and Lindi Regions • Tan-L47: Prawn fisheries support programme for Rufiji District
17. Performance indicators:	Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort; reduced incidences of infrigement.
18. Comments:	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. A synergetic link would also be to the EU funded project on capacity and implementation (2012-2017) for coastal districts of Temeke, Rufiji and Mafia. References: Malan, P. 2014. The state of Monitoring, Control and Surveillance in the United Republic of Tanzania. A report for SWIOFish. Mkenda, AF and Folmer, H. 2001. The Maximum Sustainable Yield of Artisanal Fishery in Zanzibar: A Cointegration Approach. *Environmental and Resource Economics* **19:** 311–328, 2001.

Tan-L43: Support MCS to end blast fishing

1. Background:	There is a very week history of enforcement of fisheries regulations in mainland Tanzania. In the past, recommendations have been made to ban destructive fishing practices from marine protected areas, something that has partial success, or the complete elimination of illegal practices. The elimination of blast-fishing (using home-made explosives and/or TNT) has been used indiscriminately and intermittently since the 1960s. Part of the problem has been confusing and contradictory legislation and lack of poltical will and corruption. Under SWIOfish, recent review have been made with recommendation for implementation. The need to firmly address fisheries control and surveillance on coastal mainland Tanzania has been re-iterated recently by Malan (2014) while working on the SWIOfish study on MCS. Many authors have lamented the on-going use of explosives in fishing along the mainland coast, especially off parts of the coast of Tanga, Dar es Salaam, Kilwa, Lindi and Mtwara. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats.
2. Title:	Support MSC to end blast-fishing
3. Action Reference:	Tan-L43
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. Dynamite or blast fishing is clearly a major MCS issue in near shore fisheries, as reflected in the thematic analysis. Patrolling alone has been ineffective. Rather, it is a complex, entrenched organized criminal enterprise run by influential people that routinely undermine and corrupt both enforcement and judicial process. Blast fishing requires a more holistic stand-alone action that involves higher level national enforcement agencies such as Police, Navy, TISS and Ministry of Justice to address illegal trafficking of explosives in Tanzania and to develop a mechanism to bring much greater accountability to investigative and judicial processes. It is widely accepted that there is insufficient monitoring, control and surveillance of the inshore waters of Tanzania and that destructive and illegal fishing takes place on a large scale. The important first step is to focus on ending the use of explosives for fishing, a practice that is commonplace from Tanga to Mtwara at selected locations, on specific tides and requiring specific water conditions to be effective. Damage to habitats cause loss of spawning and nursery grounds, loss of biodiversity and diminished habitat resilience, and the destruction is particularly relevant given the climate change threats to inshore marine habitats.
5. Objective:	By 2020 blast-fishing has ended and will not re-appear.
6. Expected outputs:	Within 5 years: • A comprehensive understanding of the factors that control the supply of detonators;

<table>
<tr><td></td><td colspan="2">• An effective enforcement task force that arrests culprit fishers, suppliers and funding elements.
• A revised judicial process to effectively end the use of explosives along the mainland coast.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering

1) Establish a marine field force unit, led by proven private sector contractor, working with and providing capacity building to the local security agencies - as currently undertaken for the anti-piracy effort that accompanied oil and gas exploration along the Tanzania coastline.
2) The new approach would be announced to al fishing communities, that unauthorised use of explosive devices will no longer be tolerated, and culprits will be apprehended, help in special detention pending due legal process (following final review and resolution of any legal loop-holes addressing security and fisheries practices).</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the improvement of fisheries production and enforcement of fisheries legislation, for the benefit of the population coastal Tanzania. Local residents and businesses are supportive of initiatives to improve their fishing industry.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local fishers and businesses may object and managed to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to fisheries data/information
• Licence plates for boats
…</td></tr>
<tr><td>Human Resources</td><td>• MCS expert
• Legal expert
• Security/fisheries patrol expert (or company)
• National security agencies
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table><tr><th>Item</th><th>Estimate in USD</th></tr><tr><td>Project preparation and mobilisation</td><td>100,000</td></tr><tr><td>Project management</td><td>200,000</td></tr><tr><td>Finalise anti-blast fishing patrol unit structure and begin implementation</td><td>1,000,000</td></tr><tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>2,000,000</td></tr><tr><td>Total</td><td>3,300,000</td></tr></table>The start of the MCS support programme relies on the completion of the review of relevant fisheries legislation, formalised and made public. Only then can the implementation of the MCS support programme begin. Similarly, the budget does not provide salaries for fisheries or district personnel engaged in their usual job description.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong central Government capable of effectively coordinating efforts:
• Fisheries department
• Higher level national enforcement agencies such as Police, Navy, TISS and Ministry of Justice
• Contractors</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (over six million) plus foreign visitors (several thousand) in terms of improved reliability of fish, from enhanced aesthetic aspects of the surrounding areas;</td></tr>
</table>

	intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-L42: Support for mainland Tanzania fisheries MCS programme
17. Performance indicators:	Numbers of successful criminal convictions associated with elicit trade in detonators (explosives) and apprehended fishers increasing then decreasing; decreased incidences of blast fishing.
18. Comments:	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. Similarly, the enforcement of MCS, particularly with respect to illegal fishing, should align with the outcomes of the Germany-funded policy, support and implementation of the national-level anti-poaching training project with the Ministry of Natural resources and Tourism (2013-2015) and the aerial surveillance project (covering elephants in the Selous Game Reserve) through the TANAPA. A synergetic link would also be to the EU funded project on capacity and implementation (2012-2017) for coastal districts of Temeke, Rufiji and Mafia. References: Malan, P. 2014. The state of Monitoring, Control and Surveillance in the United Republic of Tanzania. A report for SWIOFish. Mkenda, AF and Folmer, H. 2001. The Maximum Sustainable Yield of Artisanal Fishery in Zanzibar: A Cointegration Approach. *Environmental and Resource Economics* **19:** 311–328, 2001.

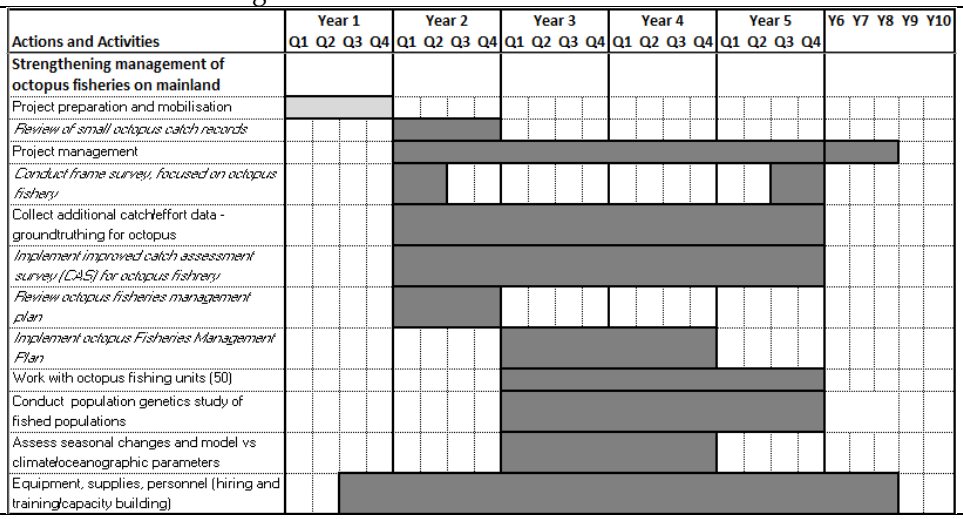
Tan-L44: Strengthening management of octopus fisheries on mainland Tanzania

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. There are several studies on octopus fisheries in Tanzania (Guard 2002; Guard and Mgaya 2002), including stock status assessments that demonstrate growth in the fishery, with export of catches. Octopus is a fast growing marine organism that appears to be a resilient with good fisheries prospects, despite its present status of being overfished in many Tanzania locations. Research to support and/or improve the management of octopus fisheries, on spatial and temporal scales, is required and strongly recommended under recent SWIOfish studies (e.g. Groeneveld 2014).
2. Title:	Strengthening the management of octopus fisheries on mainland Tanzania
3. Action Reference:	Tan-L44
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. It is widely accepted that there is inadequate knowledge on both the fishery and the biology of the octopus fishery of Zanzibar and mainland Tanzania. In order to fill that gap, a series of investigations and interventions are needed.
5. Objective:	By 2025 the octopus fishery is sustainably managed.
6. Expected outputs:	The outputs of the action to support the octopus fishery on mainland Tanzania are: • Simple indicators developed that rely on basic information to assess relative octopus stock status • Traditional fisheries management methods (i.e. closed seasons/areas) tested for their validity as an alternative management strategy. • Genetic stock structure of *Octopus cyanea* at selected sites along mainland Tanzania investigated (for comparison with wider SWIO region stock)

	• Octopus fishery management systems strengthened with the aim of eventually applying for eco-labelling of products.	
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Review and analyse previous catch data to assess the usefulness of the dataset, and improve data collection protocols 2) Collect additional catch and effort information (from different areas and water depths) for ground-truthing with subsampling to obtain biological information (reproductive details, size, etc.) to be used for indicator developments (over 4 years) and update indicators regularly for management purposes 3) Work with fishing units (50) to closely monitor movements, in exchange for e.g. solar lamps and other equipment 4) Conduct population genetics study of fished populations (2 above) 5) Assess seasonal changes in species composition; spatiotemporal shifts in fishing effort trends along the coast; and reconstruct total catch from the fishery and model variability in catch rates and species composition trends relative to long term environmental/oceanographic information (GOOS; NOAA etc.) to assess the effects of climatic variability on stocks 6) Work with local fishers to trial and compare traditional closed season management approach for validation and analysis of subsequent harvest individuals 7) Develop fisheries management plans to address the octopus fishery 8) Capacity building with relevant fisheries institutions and beach recorders	
8. Assumptions:	The Tanzania Government is committed to supporting the improvement of fisheries for the benefit of the population of coastal Tanzania. Local residents and businesses are supportive of initiatives to improve their small pelagic fishery.	
9. Risks:	Local residents and businesses may object and manage to block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Access to fisheries data/information • Solar lamps and ancillary equipment (x100) for octopus fishers ..
	Human Resources	• Fisheries scientists (ecology, data management, socio-economists, economist) • Genetic tissue analyst • ..

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Review of small octopus catch records	Na
Project management	200,000
Conduct frame survey, focused on octopus fishery	na
Collect additional catch/effort data - groundtruthing for octopus	200,000
Implement improved catch assessment survey (CAS) for octopus fishrery	na
Review octopus fisheries management plan	na
Implement octopus Fisheries Management Plan	na
Work with octopus fishing units (50)	150,000
Conduct population genetics study of fished populations	200,000

	<table><tr><td>Assess seasonal changes and model vs climate/oceanographic parameters at selected sites</td><td>100,000</td></tr><tr><td>Equipment, supplies, personnel (hiring and training/capacity building)</td><td>100,000</td></tr><tr><td>Total</td><td>1,000,000</td></tr></table> The coarse budget does not provide for reviewing existing catch data, frame survey data collection, implementing revised catch assessment nor revision of the octopus fisheries management plan, provided that these activities are undertaken as part of a separate initiative Tan-L40 (above).
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts: • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (over six million) plus foreign visitors (several thousand) in terms of improved reliability of octopus, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L40: Fisheries sector review by fishery types and management areas

	• Tan-L42: Mainland Tanzania fisheries MCS programme
17. Performance indicators:	Increased and sustained fish catch per unit effort; improved quality of octopus landed; stabilised fishing effort.
	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. References: Groeneveld, JC ,Fennessy, ST, Everett BI and Robey J 2014. Final Report: March 2014 Specialist Report: Rapid Assessment of the State of Commercial Fisheries and Main Species Exploited in Tanzania. Oceanographic Research Institute, Durban. Guard, M. 2002. The Artisanal Fishery for *Octopus cyanea* Gray (1849) in Tanzania; Tanga, Mafia Island Marine Park and Mtwara: Fishery Assessment, Biological Accounts and Implications for Management. Final Technical Report. June 2002. University of Dar es Salaam and Institute of Marine Sciences, Zanzibar. Guard, M. and Mgaya, YD. 2002. The artisanal fishery for *Octopus cyanea* Gray in Tanzania. Ambio 31(7-8): 528-536.

Tan-L45: Strengthening the seaweed farming industry on mainland Tanzania

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. There are several studies seaweed farming on Zanzibar and parts of mainland Tanzania (e.g. Tanga), which have made recommendations on means to improve the income and benefits from the farming of seaweed. The formation of the farmer groups has significantly improved the diversity and subsequent income associated with the production of seaweed and derivative products like soaps, oils, foodstuffs etc.
2. Title:	Strengthening the seaweed farming industry on mainland Tanzania
3. Action Reference:	Tan-L45
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. It is widely accepted that there is incomplete knowledge on the seaweed farming industry on mainland Tanzania (and Zanzibar) and that in order to fill that gap, a series of investigations and interventions are needed. The sector has good potential for growth, but there is a need to investigate value-adding at local level to increase the value of the sector and break buyer monopoly (i.e. low prices fetched for dried unprocessed product), to understand the decline in production in some places with increased in other, whether there are changes in coastal water conditions that favour or hinder growth, and to address health complications associated tending to the seaweed lines
5. Objective:	By 2025 the seaweed farming industry is equitably managed for the benefit of producers, buyers and the environment.
6. Expected outputs:	In alignment with relevant SWIOfish draft recommendations, the outputs of the Action to support the seaweed farming industry on mainland Tanzania are: • Review and implementation of a Seaweed Management Plan. • Strengthened seaweed resources departments.

	• Investigated value-adding at local level. • Differences in the species growth, water conditions between different mainland sites investigated to assist determine factors affecting differences in production from the two areas. • Investigated boosting formation of cooperatives and groups to assist diversify income and boost revenue from local production. • Feasibility study completed on the potential for a seaweed processing facility at an appropriate location along the coast.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Review the Seaweed Management Plan 2) Review and analyse previous harvest data to assess the usefulness of the dataset, and improve data collection protocols 3) Work with farming units (50) to closely monitor movements, in exchange for e.g. relevant equipment 4) Assess whether the relevant department in fisheries is appropriately staffed, and if not strengthen the Unit 5) Research the scope for value addition: making seaweed soap, attractiveness of products improved, processing and market research, promotion and customer reactions 6) Research new strains and farming method that could extend farms into slightly deeper water – thus expanding the capacity of mainland for seaweed farming 7) Assess seasonal changes in species yields; spatio-temporal shifts in yields per unit effort trends along the coast and between sites. 8) Model yield variability and species composition trends relative to long term environmental/oceanographic information (GOOS; NOAA etc.) to assess the effects of climatic variability on production 9) Conduct feasibility study on facility required for semi-processed or fully processed product for export at a higher price.
8. Assumptions:	The Tanzania Government is committed to supporting the improvement of seaweed production for the benefit of the population of coastal mainland. Local residents and businesses are supportive of initiatives to improve their seaweed farming industry.
9. Risks:	Local residents and businesses may object and manage to block the project.
10. Means of implementation:	Logistics, technical, scientific: • Budgets for meetings • Budgets for technical assistance • Access to seaweed harvest data/information … Human Resources: • Seaweed scientists (ecology, data management, socio-economists, economist) • Marine ecologists • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Mobilisation/review of harvest records	50,000
Project management	200,000
Conduct frame survey	50,000
Work with farmers (50) to improve understanding of opportunities for value-adding	150,000
Review seaweed farming management plan	na
Implement Seaweed Farming Management Plan	50,000

	Conduct feasibility study for seaweed processing plant at two selected sites (e.g. Tanga and Kilwa)	100,000
	Study options for alternative species	100,000
	Assess seasonal changes and model vs climate/oceanographic parameters for each species and areas (at selected siates)	100,000
	Equipment, supplies, personnel (hiring and training/capacity building)	100,000
	Total	1,000,000

12. Source of funding:

- Tanzania Government (budget, participation)
- Private Sector (participation)
- NGOs (participation)
- Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes

13. Responsible for the action:

Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts:

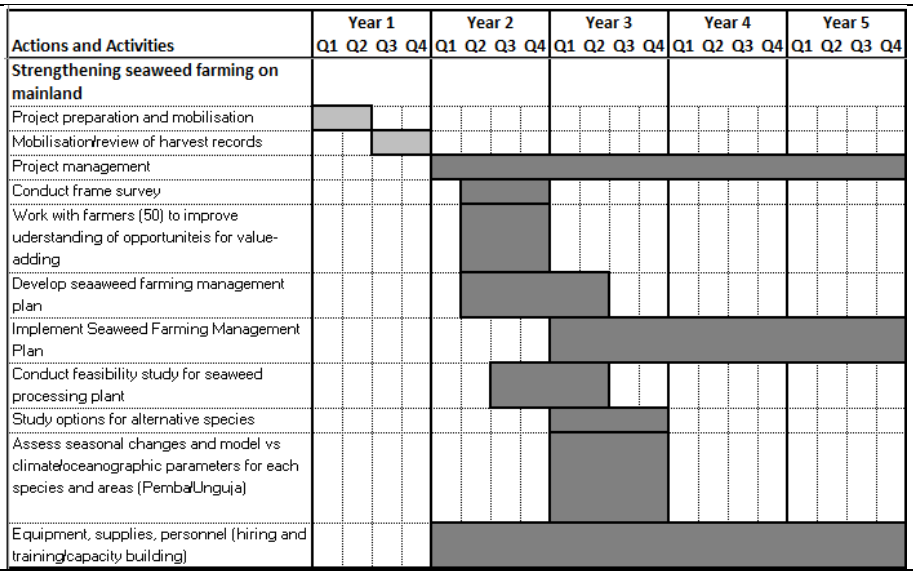
- TAFIRI, Mbegani, IMS
- Contractors
- NGOs
- etc…

14. Beneficiary from the action:

Local farmers (tens of thousands) in terms of improved reliability of harvest of seaweed, and from enhanced production.

Indirect or long term beneficiaries will be the coastal populations at large that through improved income security, among women, and thus bettered opportunities for socio-economic development without compromising sustainable natural resources and environmental management.

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following systemic and local actions:

- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management

	• Tan-L40: Fisheries sector review by fishery types and management areas • Tan-L48: Fish farming research and cage trials in Tanga and Kilwa
17. Performance indicators:	Increased and sustained seaweed harvest per unit effort; improved quality of seaweed landed; stabilised or increased farming effort.
	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. References: Frocklin, Sarah; M. de la Torre-Castro; L. Lindstrom; N. Jiddawi and F. Msuya . (2012). Seaweed mariculture as a development project in Zanzibar, East Africa: A price too high to pay? Aquaculture, 356–357: 30–39. Groeneveld, JC ,Fennessy, ST, Everett BI and Robey J 2014. Final Report: March 2014 Specialist Report: Rapid Assessment of the State of Commercial Fisheries and Main Species Exploited in Tanzania. Oceanographic Research Institute, Durban.

Tan-L46: Tuna fisheries support programme for Mtwara and Lindi regions

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Most medium and large pelagics are migratory species, undertaking seasonal movements within the Indian Ocean basin. There are few studies on tuna fisheries in Tanzania (Richmond & Mganwa, 1995), though they demonstrate significant growth in the fishery, based on 1-km long gill-nets set on darker moon nights, largely operating from Nungwi in northern Unguja, Zanzibar. Estimates of stock are not available and stock status indicators available from the IOTC are not specific to Tanzania. Some species may comprise resident populations over the continental shelf of Tanzania (neritic species, accessible to small scale fishers, such as those from Mtwara and Lindi). However, the IOTC estimates that medium-sized pelagics (kawakawa, skipjack, kingfish) are moderately exploited; albacore is underexploited and bigeye and yellowfin tunas are not overfished. Most estimates are uncertain, but there appears to be considerable scope for fisheries development. Tuna is a fast growing fish species with movements of schools throughout the western and northweastern Indian Ocean. Fish caught off Tanzania by local fishers tend to be small to moderate sized (5-10 kg), caught mostly from surface trolling or surface-set gillnets. Large individuals, from 20-40 kg are reportedly deeper in the water column, close to the thermocline at 70-100 m depths. Research to support and/or improve the management of the fishery for tuna and tune-like species, on spatial and temporal scales, is required and strongly recommended under recent SWIOfish studies (e.g. Groeneveld 2014). Representing both governments, the Deep Sea Fishing Authority (DSFA) has jurisdiction over fisheries issues in the EEZ (between 12 and 200 nm from the shore; mainly tunas and billfishes), whereas small scale (artisanal) fisheries for large /medium pelagics are managed by relevant ministries. These small-scale fisheries take place in territorial waters, up to 12 nm from the shore, and focus on neritic species.
2. Title:	Tuna fisheries support programme for Mtwara and Lindi Regions
3. Action Reference:	Tan-L46

4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. It is widely accepted that there is inadequate knowledge on both the fishery and the biology of the tuna fishery of Zanzibar and mainland Tanzania. In order to fill that gap, a series of investigations and interventions are needed. Similarly, the establishment of the DSFA is regarded as a major step forward in terms of management effectiveness of tuna and tuna-like species (e.g. Groeneveld 2014). They argue that though it is still in its infancy, it needs to be further empowered and full implementation supported.
5. Objective:	By 2025 the tuna fishery is sustainably managed and yield per unit effort increased.
6. Expected outputs:	In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support the tuna fishery at Mtwara and Lindi are: • Simple stock status indicators developed for the most important neritic tuna species • Main fishing grounds used by small-scale fishers (GPS and VMS tracking) mapped • Genetic stock structure of key neritic species (regional project) identified • IOTC compliance strengthened by improving reporting standards (resolution of catch • IOTC working parties hosted at DSFA • Data of neritic tunas to species level recorded • Reviewed and improved links between TAFIRI (as applied research facility) and the DSFA and the two Fisheries Departments (management facilities) (5 years). • New semi-industrial fishing methods for targeting medium and large pelagics trialed , i.e. pole-and-line, droplines and FADs, with lessons learnt during previous trials taken into account first • Bycatches of sharks and rays made by pelagic longliners assessed
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Use CAS and Frame survey data, and conduct biological studies (yellowfin, skipjack, kawakawa and Spanish mackerel suggested) to provide information to assess stock status 2) Identify hotspots of neritic tunas and sample to species level to obtain a realistic species breakdown for Tanzania for IOTC reporting purposes 3) Train samplers to identify large and medium pelagics to species level (2 years) through development and production of fisheries handbooks 4) Assess genetic population structure of key neritic species (yellowfin skipjack, kawakawa, Spanish mackerel) at local and regional levels, by including samples from neighbouring countries to assess if there are different stocks in the region (5 years). 5) Work with small scale fleet (10 vessels) to track vessel movements through cell-phone technology and VMS to define fishing grounds; sample catches to provide seasonal information on nursery areas, growth, reproduction, migrations and behaviour (5 years). 6) Construct and test FADs in nearshore waters (3 years). 7) Trial pole-and-line and dropline fishing (3 years). 8) Host some of the IOTC working parties, to raise awareness internally and also improve chances of getting IOTC quota (5 years).

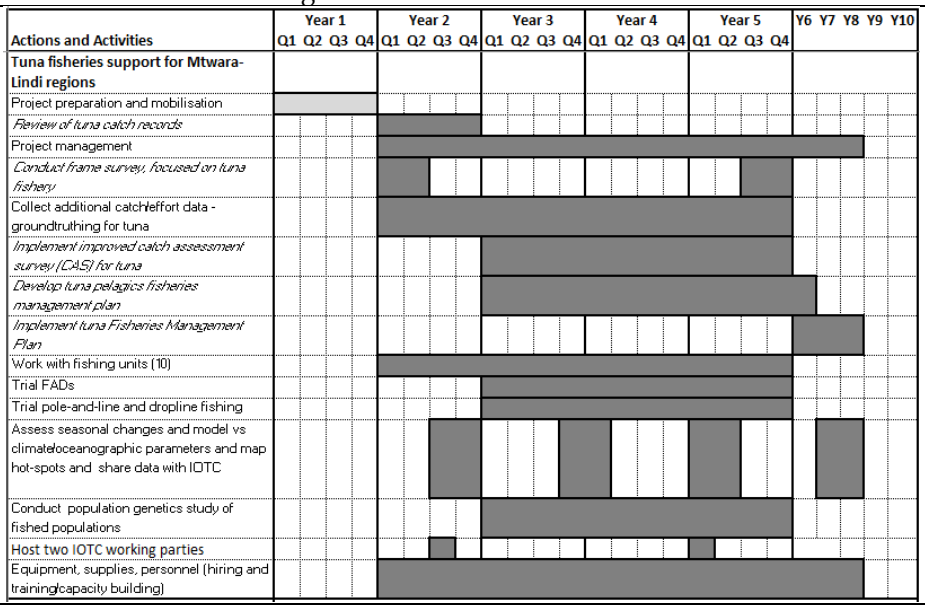
	9) Identify and quantify the most common shark and ray species caught by long-line fisheries, and determine the proportion of this bycatch that is retained, compared to the proportion that is discarded.	
8. Assumptions:	The Tanzania Government is committed to supporting the improvement of fisheries for the benefit of the population of coastal Tanzania. Local residents and businesses are supportive of initiatives to improve their small pelagic fishery.	
9. Risks:	Local residents and businesses may object and managed to block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Access to fisheries data/information • GPS, mobile phones and VMS units (10) • …
	Human Resources	• Fisheries scientists (ecology, data management, socio-economists, fisheries economist) • Master fisherman • FAD expert • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Project management	200,000
Conduct frame survey, focused on tuna fishery	na
Collect additional catch/effort data - groundtruthing for tuna	200,000
Implement improved catch assessment survey (CAS) for tuna	na
Review tuna pelagics fisheries management plan	na
Implement tuna Fisheries Management Plan	na
Work with fishing units (10)	200,000
Trial FADs	400,000
Trial pole-and-line and dropline fishing	500,000
Assess seasonal changes and model vs climate/oceanographic parameters and map hot-spots and share data with IOTC	200,000
Conduct population genetics study of fished populations	200,000
Host two IOTC working parties	200,000
Equipment, supplies, personnel (hiring and training/capacity building)	400,000
Total	**2,600,000**

The coarse budget does not provide for reviewing existing catch data, implementing revised catch assessment nor development and implementation of the tuna fisheries management plan, provided that these activities are undertaken as part of a separate initiative Tan:L40 (see above).

12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts: • Contractors • TAFIRI, Mbegani, IMS • NGOs • etc…

14. Beneficiary from the action:	Local residents (several hundred thousand in Mtwara and Lindi) plus foreign visitors (several thousand) in terms of improved reliability of fish, from enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L40: Fisheries sector review by fishery types and management areas • Tan-L41: Small pelagic fisheries support on mainland Tanzania • Tan-L42: Mainland Tanzania fisheries MCS programme • Tan-L48: Fish farming research and cage trials in Tanga and Kilwa
17. Performance indicators:	Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.
	Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. References: Groeneveld, JC ,Fennessy, ST, Everett BI and Robey J 2014. Final Report: March 2014 Specialist Report: Rapid Assessment of the State of Commercial Fisheries and Main Species Exploited in Tanzania. Oceanographic Research Institute, Durban. Richmond, M.D. & Mganwa, G. R. 1995. *Involvement of local fishermen in data collection on the East coast of Unguja, Zanzibar, and the importance for management*. 9 pp. Presented at the National Workshop on Integrated Coastal Zone Management, Zanzibar, Tanzania. May 8-12, 1995. World Bank/SAREC.

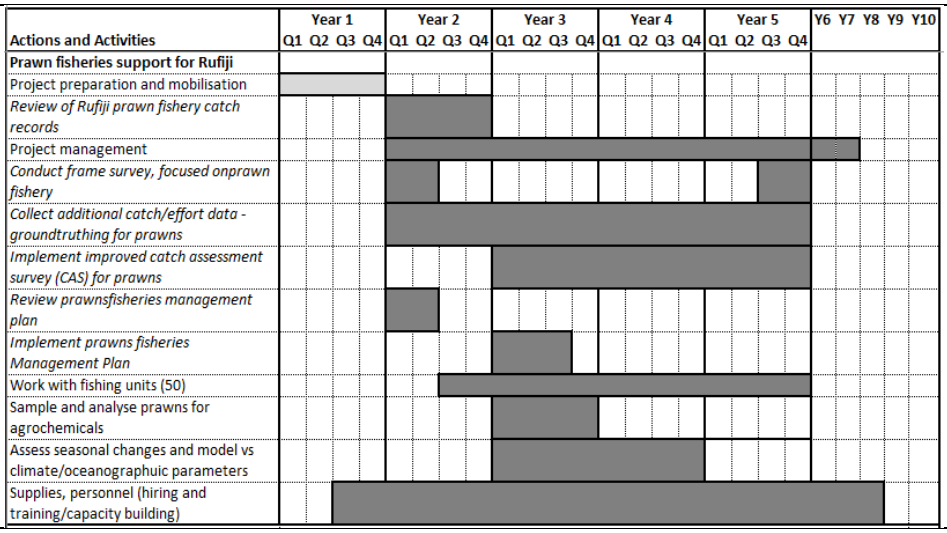
Tan-L47: Support for prawn fishery in Rufiji Delta

1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Research to support and/or improve the management of the fishery for prawns, on spatial and temporal scales, is required and strongly recommended under recent SWIOfish studies (e.g. Groeneveld 2014). These small-scale fisheries for prawns utilised gillnets, traps and fences, in creeks and shallow grounds around the Rufiji delta, from where the bulk of Tanzania catches originate. Lack of accurate fishing effort and understanding of the impacts of the artisanal fishery threatens its management and long-term sustainability. The industrial fishery collapsed several years ago and has not re-emerged, due to poor yields.
2. Title:	Prawn fishery support programme for Rufiji Delta
3. Action Reference:	Tan-L47
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. The shores and creeks of Rufiji delta support over one thousand canoes and many hundred fence traps, targeting the main penaeid prawn species. These small-scale fisheries for prawns utilised gillnets, traps and fences, in creeks and shallow grounds around the Rufiji delta, from where the bulk of Tanzania catches originate. Lack of accurate fishing effort and understanding of the impacts of the artisanal fishery threatens its management and long-term sustainability. The industrial fishery collapsed several years ago and has not re-emerged, due to poor yields.
5. Objective:	By 2025 Rufiji delta prawn fishery understood and sustainably managed.
6. Expected outputs:	In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support prawn fishery research in Rufiji are:

<table>
<tr><td></td><td colspan="2">• Simple indicators developed that rely on basic information to assess relative prawn stock status
• Traditional fisheries management methods (i.e. closed seasons/areas) tested for their validity as an alternative management strategy.
• Genetic stock structure of selected species investigated (for comparison with wider SWIO region stock)
• Sampled material for agrochemical tested in certified laboratory
• Rufiji prawn fishery management systems strengthened with the aim of eventually applying for eco-labelling of products</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Review and analyse previous catch data to assess the usefulness of the dataset, and improve data collection protocols
2) Collect additional catch and effort information (from different areas and water depths) for ground-truthing with subsampling to obtain biological information (reproductive details, size, etc.) to be used for indicator developments (over 4 years) and update indicators regularly for management purposes
3) Work with fishing units (50) to closely monitor movements, in exchange for e.g. solar lamps and other equipment
4) Conduct population genetics study of fished populations (2 above)
5) Assess seasonal changes in species composition; spatiotemporal shifts in fishing effort trends along the coast; and reconstruct total catch from the fishery and model variability in catch rates and species composition trends relative to long term environmental/oceanographic information (GOOS; NOAA etc.) to assess the effects of climatic variability on stocks
6) Work with local fishers to trial and compare traditional closed season management approach for validation and analysis of subsequent harvest individuals
7) Collected material for shipment to certified laboratory for agrochemical testing
8) Develop fisheries management plans to address the Rufiji prawn fishery
9) Capacity building with relevant fisheries institutions and beach recorders</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting the improvement of fisheries production, for the benefit of the population of coastal districts. Local residents and businesses are supportive of initiatives to improve their fishing industry and amenable to participating in farmed fish trials and its development.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local fishers and businesses may object and managed to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Budgets for meetings
• Budgets for technical assistance
• Access to fisheries data/information
• Laboratory and hatc½hling nursery equipment
• 10 fish cages (constructed locally or imported ready-made)
• Boat hire/purchase
• Fish feeds
• …</td></tr>
<tr><td>Human Resources</td><td>• Professional prawn fishery expert
• Tanzania-based prawn and coastal fishery experts (x4)
• Boatmen
• Assistants
• Security
• Economist
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table><tr><th>Item</th><th>Estimate in USD</th></tr><tr><td>Project preparation and mobilisation</td><td>100,000</td></tr></table></td></tr>
</table>

	<table><tr><td>Project management</td><td>200,000</td></tr><tr><td>Conduct frame survey, focused on prawn fishery</td><td></td></tr><tr><td>Collect additional catch/effort data - groundtruthing for prawns</td><td></td></tr><tr><td>Implement improved catch assessment survey (CAS) for prawns</td><td></td></tr><tr><td>Review prawn fisheries management plan</td><td></td></tr><tr><td>Implement prawn fisheries Management Plan</td><td></td></tr><tr><td>Work with fishing units (50)</td><td>500,000</td></tr><tr><td>Sample and analyse prawns for agrochemicals</td><td>100,000</td></tr><tr><td>Assess seasonal changes and model vs climate/oceanographic parameters</td><td>300,000</td></tr><tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>500,000</td></tr><tr><td>Total</td><td>1,700,000</td></tr></table> The coarse budget does not provide for reviewing existing catch data, frame survey data collection, implementing revised catch assessment nor revision of the octopus fisheries management plan, provided that these activities are undertaken as part of a separate initiative Tan-L40 (above).
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government fisheries development stakeholder with expertise in fish farming capable of effectively coordinating efforts: • Mbegani Fisheries Training Institute • Tanzania Fisheries Research Institute • Institute of Marine Sciences (UDSM) • NGOs • Private sector • …
14. Beneficiary from the action:	Local residents (over six million) plus foreign visitors (several thousand) in terms of improved mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management reliability of fish, from enhanced aesthetic aspects of the surrounding areas;

15. Schedule:



16. Links to other actions:

Links to following systemic actions would be desirable:

- Tan-S01: Integrated Coastal Zone Management
- Tan-S04: Information Management
- Tan-S06: Awareness Raising
- Tan-S07: Integrated Legal Review

Of particular relevance and importance would be links to following systemic and local actions:

- Tan-S02: Spatial Planning
- Tan-S03: Shoreline Management
- Tan-L40: Fisheries sector review by fishery types and management areas
- Tan-L42: Mainland Tanzania fisheries MCS programme

17. Performance indicators:

Increased and sustained prawn catch per unit effort; improved quality of prawn landed; stabilised fishing effort.

18. Comments:

Note: Any interventions into fisheries development should be aligned with other efforts, the most prominent at present being the SWIOfish projects supported by the World Bank, working with the Department of Fisheries. A synergetic link would also be to the EU funded project on capacity and implementation (2012-2017) for coastal districts of Temeke, Rufiji and Mafia.

References:

de Graaf, G 2013. Rapid Assessment of Fisheries and Aquaculture Information Management System (FIMS) in mainland Tanzania and Zanzibar. First Draft Report. SWIOFish.

Mmochi AJ, 2011. Overview of Aquaculture Activities in Tanzania. In Torell et al (eds). Mariculture in the WIO region - Challenges and Prospects. WIOMSA Book Series No. 11

Torell, M., Hecht, T., Beveridge, M., Stead, S., Bryceson, I., Kautsky, N., Mmochi, A., Ollevier, F. (eds.) (2011) Mariculture in the WIO region - Challenges and Prospects. WIOMSA Book Series No. 11. viii + 59pp.

Lesperance, AD 2011. Mariculture Development in Seychelles and other Western Indian Ocean Island States: An Overview of Challenges and Prospects. In Torell et al (eds). Mariculture in the WIO region - Challenges and Prospects. WIOMSA Book Series No. 11

Tan-L48: Fish farming research and cage trials in Tanga and Kilwa

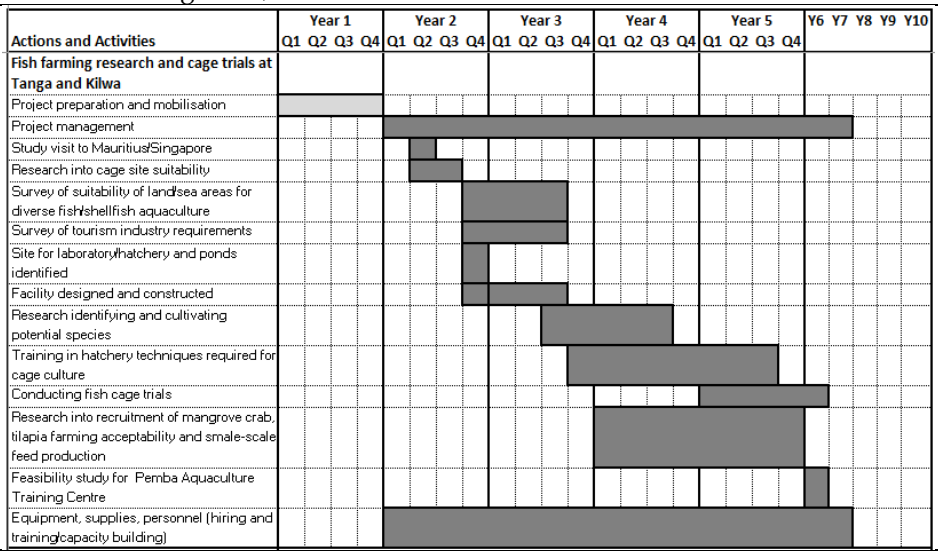
1. Background:	The artisanal/small-scale fishery sector in mainland Tanzania supports a significant proportion of local livelihoods. In 2009, the Joint Frame Survey estimated that the activity provided full time employment for over 36,321 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit. The pragmatic outlook on the fisheries sector on Tanzania's mainland coast is that there is little room for expansion and the current and increasing pressure is damaging the productivity. Catches are unlikely to increase with more fishing effort. Some potential increase may be gained from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. According to de Graff (2014)'s SWIOfish study, mariculture in Tanzania is limited and other than seaweed farming, encompasses only milk fish farming (ca. 5 ponds, 12 ha total area), with total production of about 8 tons/year. Indeed, while there have been several trials of different pond (and cage) culture attempts over the last thirty years, most remain in the experimental or pilot stage (see Mmochi et 2001). The locally-based Institute of Marine Sciences (IMS) has over twenty years of experience with various small-scale pond and seaweed farming trials and demonstration projects, including those involving local communities. Experimenting with more commercial species and greater investment has not been attempted. Mbegani and TAFIRI with some technical assistance are well-qualified to conduct the necessary studies. Mauritius has experimented with cage culture and produce 175 tonnes of high value from circular cages in 2008 (Lesperance, 2011). Other countries bordering the Indian Ocean have greater experience and production. For example, in Singapore there are 106 licensed coastal floating netcage fish farms. In 2013, the marine aquaculture industry produced 3,235 tonnes of food fish at a value of USD 11.4 million. The main species are grouper, seabass and snapper, as well as crabs, shrimp and mussels. The Barramundi Asia Farm and Nursery has a 2-hectare USD 3 million fish farm using European and Japanese sea cage fish farming technology. Torell et al (2011) warn that aquaculture development in the WIO give due consideration to each of the three pillars of sustainability: a balanced understanding of the social, economic and environmental components of aquaculture, within an enabling governance framework.
2. Title:	Fish farming research and cage trials in Tanga and Kilwa
3. Action Reference:	Tan-L48
4. Justification:	The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The

	significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. The use of destructive fishing gears, causing a decline in catches, was ranked as the most severe threat, level 5, for the fisheries sector as a whole. Poor fisheries resource management was ranked at level 4 for the sector as a whole. At district levels, the threat from destructive fishing and decline catches was the most highly ranked of all threats to coastal livelihoods and ecosystems. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated. It is widely accepted that there is inadequate development of fish farming in Zanzibar and on mainland Tanzania. In order to fill that gap, a series of investigations and interventions are needed. Pond culture trials have bene the main focus to date, yet more recent initiative in the WIO region include cage culture of high value fish such as cobia and grouper in Mauritius. A characteristic of marine production in Africa has been production of high value species destined for international markets, or on species generating large biomass from low provide vital protein for local consumption but does generate livelihoods and needed incomes (Torell et al 2011). Such high value species if cultured on at Tanga and Kilwa would be ideal for the tourism industry that demands quality fish for restaurants and supplying Dar es Salaam markets. These authors recommend, among others, that trials be considered for mangrove snappers and octopus, that the acceptability of freshwater pond farming of tilapia be tested, that cost-effective feeds for small-scale mariculture operations be developed. The inshore waters around Tanga and Kilwa are potentially deep waters that are sheltered from wave action with good water circulation due to the 4 m tidal range. These condition are ideal for cage culture of high value finfish. The small pelagic fishery in the areas offer the opportunity for feed provision and labour is available. The main elements that are lacking are a hatchery/laboratory, technology and expertise.
5. Objective:	By 2025 at high value farmed seafood from Tanga and Kilwa supplying tourism sector
6. Expected outputs:	The outputs of the action to support fish farming research and cage trials in Tanga and Kilwa are: • Study tours for fisheries mariculture unit and IMS/TAFIRI aquaculture experts to Mauritius and Singapore completed • New aquaculture candidate species for cage trials identified from local scoping studies • Technology and expertise for cage culture of high value fish developed • Design and construction of hatchery and nursery facilities completed • Feasibility study for Tanga and Kilwa Aquaculture Training CentresRecruitment studies for mangrove crab completed • Local acceptability of tilapia fish farming tested • Tourism industry requirement and timing fully understood • Potential for pearl oyster farming investigated • Cost-effective feeds for small-scale mariculture operations developed • Knowledge of where certain scales of aquaculture operations are suitable (applying ICZM perspectives) gathered and areas identified and zoned. • Local capacity in fish farming developed so as to make meaningful technological contributions.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Research for new aquaculture candidate species identified from local scoping studies

	2) Study tours to Mauritius and Singapore 3) Technology and expertise for cage culture of high value fish are developed 4) Feasibility study for Tanga and Kilwa Aquaculture Training Centre completed 5) Recruitment 6) perspectives) are identified and zoned. 7) Local capacity in studies for mangrove crab completed 8) Local acceptability of tilapia fish farming be tested 9) Tourism industry requirement and timing is fully understood 10) Potential for pearl oyster farming investigated 11) Cost-effective feeds for small-scale mariculture operations developed 12) Knowledge of where certain scales of aquaculture operations are suitable (applying ICZM fish farming developed so as to make meaningful technological contributions	
8. Assumptions:	The Tanzania Government is committed to supporting the improvement of fisheries production, for the benefit of the population of Tanga and Kilwa. Local residents and businesses are supportive of initiatives to improve their fishing industry and amenable to participating in farmed fish trials and its development.	
9. Risks:	Local fishers and businesses may object and managed to block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Access to fisheries data/information • Laboratory and hatchling nursery equipment • 10 fish cages (constructed locally or imported ready-made) • Boat hire/purchase • Fish feeds • …
	Human Resources	• Professional fish hatchery technician • Tanzania-based aquaculture experts (x4) • Tropical fish farming experts (e.g. from Singapore/Mauritius) • Boatmen • Assistants • Security • Economist • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Project management	200,000
Study visit to Mauritius/Singapore	50,000
Research into cage site suitability	500,000
Survey of suitability of land/sea areas for diverse fish/shellfish aquaculture	100,000
Survey of market requirements	50,000
Site for laboratory/hatchery and ponds identified (x2)	100,000
Facility designed and constructed	2,000,000
Research identifying and cultivating potential species	500,000
Training in hatchery techniques required for cage culture	100,000
Conducting fish cage trials	100,000
Research into recruitment of mangrove crab, tilapia farming acceptability and smale-scale feed production	100,000
Feasibility study for Tanga and Kilwa Aquaculture Training Centres	100,000

	Equipment, supplies, personnel (hiring and training/capacity building) — 2,000,000 Total — **6,000,000** The coarse budget does not provide for purchase of land for the laboratory/hatchery; nor of costs associated with housing/removal of illegal squatters etc. which are considered a government issue.
12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government fisheries development stakeholder with expertise in fish farming capable of effectively coordinating efforts: • Institute of Marine Sciences (UDSM) • TAFIRI, Mbegani • NGOs • Private sector • …
14. Beneficiary from the action:	Local residents (over six million) plus foreign visitors (several thousand) in terms of improved mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced destructive fishing in coastal waters. Indirect or long term beneficiaries will be the coastal populations at large that through improved food quality will have bettered their opportunities for socio-economic development without compromising sustainable natural resources and environmental management reliability of fish, from enhanced aesthetic aspects of the surrounding areas;
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L40: Fisheries sector review by fishery types and management areas • Tan-L41: Small pelagic fisheries support on mainland Tanzania • Tan-L42: Mainland Tanzania fisheries MCS programme

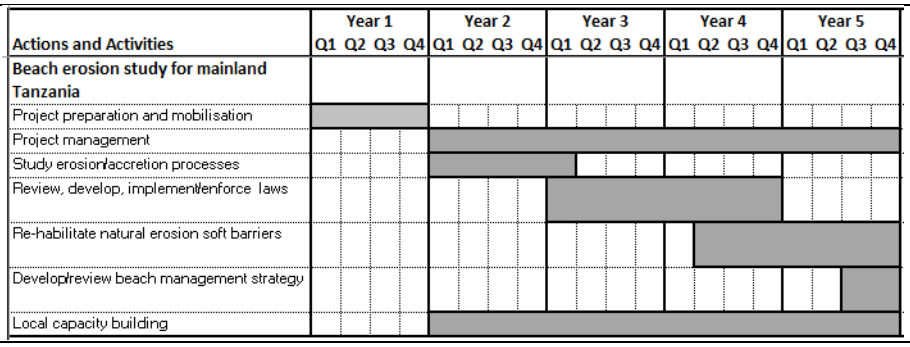
17. Performance indicators:	Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.
18. Comments:	Note: After initial successes have been recorded at developing cage and other fish and invertebrate farming production, the site would then have the potential to be expanded into a larger and broader aquaculture training facility. References: de Graaf, G. 2013. Rapid Assessment of Fisheries and Aquaculture Information Management System (FIMS) in mainland Tanzania and Zanzibar. First Draft Report. SWIOFish. Mmochi A.J. 2011. Overview of Aquaculture Activities in Tanzania. In Torell et al (eds). Mariculture in the WIO region - Challenges and Prospects. WIOMSA Book Series No. 11 Torell, M., Hecht, T., Beveridge, M., Stead, S., Bryceson, I., Kautsky, N., Mmochi,A., Ollevier, F. (eds.) 2011. Mariculture in the WIO region - Challenges and Prospects. WIOMSA Book Series No. 11. viii + 59pp. Lesperance, A.D. 2011. Mariculture Development in Seychelles and other Western Indian Ocean Island States: An Overview of Challenges and Prospects. In Torell et al (eds). Mariculture in the WIO region - Challenges and Prospects. WIOMSA Book Series No. 11

Tan-L49: Beach erosion study for coastal Tanzania

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities, but also from oceanic and weather influences that are thought to be contributing to coastal erosion. The population of coastal districts has reached its highest ever and development pressures on the coastline have reached unprecedented levels. Many locations along the coasts, especially at the districts of Pangani, Muheza, Bagamoyo, Kinondoni, Kilwa and Mtwara, suffer from coastal erosion, which may be further worsened by sand mining conducted by local villagers, the tourism sector and building material suppliers, as well as by some of the measures taken by beach hotels to mitigate the impacts of erosion, namely inappropriate sea defences. The costs to the tourism sector is increasing. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Various studies have documented the changing beach levels and the loss of sand, which are particularly visibly along the beach fronts of Kinondoni where hotels and private residences have constructed a series of groynes to attempt to combat the problem of the northern drift of beach sand. Such attempts may exacerbate the problem. What is needed is a full understanding of the processes involved before measures can be taken.
2. Title:	Beach erosion study for mainland Tanzania
3. Action Reference:	Tan-L49
4. Justification:	Coastal erosion was ranked with severity value 5 for Bagamoyo, 4 for Temeke, Tanga, Pangani, Muheza, Mtwara Urban and Kinondoni, and level 3 for Ilala district. The remaining districts mostly scored a lesser threat values for erosion, between 1 and 2. With the potential sea level rise for the coastline, if left unattended, the erosion problem affecting these eight mainland districts will worsen with more severe costs, negative visual impact on the tourism sector, greater probability of sea water intrusion into agricultural and other land uses and the water table.
5. Objective:	By 2025, shoreline development planning and control adequately take erosion and accretion processes into account.
6. Expected outputs:	The outputs of the action to study erosion along the mainland coast of Tanzania are: • Understand the oceanographic and meteorological influences on the coastlines (to better understand beach erosion and means to address the problem) • Shorelines under consideration are no longer eroded • Shoreline under consideration effectively managed
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Study erosion/accretion processes along the coast and monitor and map changes. 2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing the shoreline. 3) Re-habilitate and mitigate natural erosion soft barriers (mangroves, shoreline vegetation).

<table>
<tr><td></td><td colspan="2">4) Develop and review beach management strategy.
5) Enforce illegal beach sand extraction
6) Guide the construction of physical mitigation measures</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting addressing the coastal erosion, enforcing relevant laws that impinge on the beaches, which are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to understand and mitigate beach erosion.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Modelling
• Satellite images
• Marine instruments
• Field surveys</td></tr>
<tr><td>Human Resources</td><td>• Oceanographers
• Civil and water engineers,
• Local planners
• Socio-economists,
• Resettlement specialists, …
• ..:</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>200,000</td></tr>
<tr><td>Study erosion/accretion processes along the coast and monitor and map changes, local capacity building</td><td>1,500,000</td></tr>
<tr><td>Review, develop, implement and enforce relevant legislative/regulatory instruments addressing the shoreline</td><td>200,000</td></tr>
<tr><td>Re-habilitate natural erosion soft barriers (mangroves, shoreline vegetation…)</td><td>3,000,000</td></tr>
<tr><td>Define and quantify costs for physical interventions</td><td>500,000</td></tr>
<tr><td>Develop and review beach management strategy</td><td>1,000,000</td></tr>
<tr><td>Total</td><td>6,600,000</td></tr>
</table>
The coarse budget does not provide for re-housing or other costs associated with illegal squatters or land-users, nor the implementation of legal measures to address beach sand extraction, which are considered government issues.
</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Local Government department (e.g. DoE) capable of effectively coordinating efforts:
• Contractors
• NGOs
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several million) plus foreign visitors (several thousand) in terms of enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation loss and smothering within inshore coastal waters.

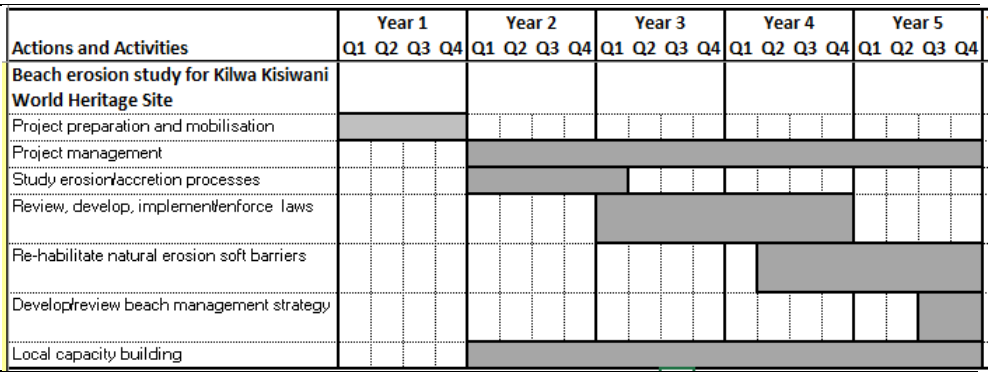
Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved coastal land stability which will better their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L50: Kilwa Kisiwani World Heritage Site erosion study
17. Performance indicators:	• Beach erosion loss from unsustainable land use reduced • Beach sand mining reduced • Local polices and guidelines for shoreline land use
18. Comments:	

Tan-L50: Kilwa Kisiwani World Heritage Site erosion study

1. Background:	The coastal zone of mainland Tanzania is under development pressure from population growth and economic activities, but also from oceanic and weather influences that are thought to be contributing to coastal erosion. The population of coastal districts has reached its highest ever and development pressures on the coastline have reached unprecedented levels. Many locations along the coasts, especially at the districts of Pangani, Muheza, Bagamoyo, Kinondoni, Kilwa and Mtwara, suffer from coastal erosion, which may be further worsened by sand mining conducted by local villagers, the tourism sector and building material suppliers, as well as by some of the measures taken by beach hotels to mitigate the impacts of erosion, namely inappropriate sea defences. The World Heritage Site of Kilwa Kisiwani has a well-documented erosion problem that has resulted in partial loss of the Portuguese Fort, one of the mina features of the monument. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. At Kilwa Kisiwani a full understanding of the processes involved is needed before mitigation measures can be designed and implemented.
2. Title:	Kilwa Kisiwani WHS erosion study
3. Action Reference:	Tan-L50
4. Justification:	Coastal erosion was ranked with severity value 5 for many coastal districts, though the relatively small area of Kilwa Kisiwani monument has not had an impact on the district threat, ranked at level 2. With the potential sea level rise for the coastline, if left unattended, the erosion problem affecting this site will worsen with more severe costs, negative visual impact on the tourism sector. In 2004, the UNESCO (see note below) evaluation of factors affecting the site were: • Erosion and siltation/ deposition • Financial resources • Identity, social cohesion, changes in local population and community • Legal framework • Management systems/ management plan • Other Threats: • Collapsing monuments due to lack of maintenance One of the recommendation of a recent study (Joint Word Heritage Centre / ICOMOS 2013) was " Commissioning of a report on the longer-term interventions required to permanently safeguard the Gereza, Mukutani beachfront mosque and Malindi Mosque".
5. Objective:	By 2025, Kilwa Kisiwani shoreline erosion and accretion processes understood and mitigations measures designed.
6. Expected outputs:	The outputs of the action to study erosion at Kilwa Kiswiani are: • Understand the oceanographic and meteorological influences on the coastline (to better understand beach erosion and means to address the problem) • Shorelines under consideration are no longer eroded • Shoreline under consideration effectively managed

<table>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Study erosion/accretion processes along the coast and monitor and map changes.
2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing the shoreline.
3) Re-habilitate and mitigate natural erosion soft barriers (mangroves, shoreline vegetation).
4) Develop and review beach management strategy.
5) Enforce illegal beach sand extraction
6) Guide the construction of physical mitigation measures</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting addressing the coastal erosion, enforcing relevant laws that impinge on the beaches, which are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to understand and mitigate beach erosion.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Modelling
• Satellite images
• Marine instruments
• Field surveys</td></tr>
<tr><td>Human Resources</td><td>• Oceanographers
• Civil and water engineers,
• Local planners
• Socio-economists,
• Resettlement specialists, …
• ..:</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>200,000</td></tr>
<tr><td>Enforce relevant legislative/regulatory instruments</td><td>200,000</td></tr>
<tr><td>Study erosion/accretion processes along the coast and monitor and map changes, local capacity building</td><td>500,000</td></tr>
<tr><td>Review, develop, implement and enforce relevant legislative/regulatory instruments addressing the shoreline</td><td>200,000</td></tr>
<tr><td>Re-habilitate natural erosion soft barriers (mangroves, shoreline vegetation…)</td><td>1,000,000</td></tr>
<tr><td>Develop and review beach management strategy</td><td>500,000</td></tr>
<tr><td>Capacity building</td><td>500,000</td></tr>
<tr><td>Total</td><td>3,100,000</td></tr>
</table>
The coarse budget does not provide for re-housing or other costs associated with illegal squatters or land-users, nor the implementation of legal measures to address beach sand extraction, which are considered government issues.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Local Government department capable of effectively coordinating efforts:
• World Heritage responsible authorities
• Contractors
• NGOs
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several thousand) plus foreign visitors (several thousand) in terms of enhanced aesthetic aspects of the surrounding areas; mangrove forest,</td></tr>
</table>

	intertidal and coral reefs resources users (including fishers) from reduced sedimentation loss and smothering within inshore coastal waters. Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved coastal land stability which will better their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L49: Beach erosion study for mainland Tanzania
17. Performance indicators:	• Beach erosion loss from unsustainable land use reduced • Beach sand mining reduced • Local polices and guidelines for shoreline land use
18. Comments:	Note: the UNESCO Committee Decisions (32 COM 7A.14) on Ruins of Kilwa Kisiwani and Ruins of Songo Mnara (United Republic of Tanzania) (C 144), among 15 notes, specifically refer to erosion under: 6. Notes with concern the challenges faced by the property from climate change, leading to among others beach erosion; 7. Notes the danger posed to heritage by these challenges and their overwhelming nature; 8. Requests partners to continue to assist the State Party financially and technically to address these challenges; 9. Reiterates its request to the State party to use the management plan as the main vehicle for managing the site and for ensuring co-ordination of all activities affecting the property. Any initiative to support the study of erosion and mitigation would need to align with the UNESCO and other efforts to protect and maintain the WHS. A recent UNESCO/French Co-operation project included in minor intervention aimed at shoring up the beach walls close to the fort where they had been eroded, through the intervention is limited and does not address on-going erosion to the monuments. Reference: Joint Word Heritage Centre / ICOMOS Reactive Monitoring Mission Ruins of Kilwa Kisiwani and Ruins of Songo Mnara – Tanzania 11 to 18 December 2013

Tan-L51: Waste oil treatment facility for Tanga, Dar es Salaam and Mtwara harbours

1. Background:	The coastal zone of Tanzania is under development pressure from population growth and economic activities, but also from oceanic and weather influences that are thought to be contributing to coastal erosion. The population of Unguja has reached its highest ever and development pressures on the coastline have reached unprecedented levels. The largest marine ports in the country are, in order of traffic, Dar es Salaam, Tanga and Mtwara. Other smaller ports include Lindi, Kilwa and Mafia. None of these ports have adequate waste oil handling facilities. With the advent of oil and gas exploration in the coastal zone has raised the issue of oil waste handling, resulting in waste oil being transported by barge to neighbouring Mombasa in Kenya. The environmental risks associated with inadequate handling of waste oil and the added costs of transportation to Kenya are high and opportunities are lost to Tanzania. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. All three harbours are presently witnessing increased vessel traffic with the increased risk of oil contamination to the marine and coastal environment due to lack of handling facilities. The traffic at these harbours is seen as likely to continue to increase in the future.
2. Title:	Waste oil treatment facility for Tanga, Dar es Salaam and Mtwara harbours
3. Action Reference:	Tan-L51
514. Justification:	Marine pollution were both identified as severity level 4, for Tanga Urban District, pollution sources including uncontrolled dumping (particularly in creeks), as well as from lack of toilets and sewage systems. Decline in fisheries, regarded as a threat of level 5, are also attributed to loss of fish nurseries like mangrove forests, themselves affected by pollution from the various sources.
5. Objective:	By 2025, Tanga, Dar es Salaam and Mtwara harbours equipped efficient and safe waste oil handling and treatment facilities and personnel qualified to operate the facilities.
6. Expected outputs:	The outputs of the action to install a oil waste collection and processing facility serving Tanga, Dar es Salaam and Mtwara harbours are: • Fully operational waste oil collection and processing plant. • Effective and sustainable waste oil collection systems in place. • Reduced waste oil discharged to sea and washed up along the coast. • Local LGA capable of managing the waste oil system.
7. Activities:	a) Project design and appraisal. b) Project tendering 1) Initial studies, design and engineering associated with waste oil handling and processing facility: review and develop existing waste oil system infrastructure (and relevant legislative/regulatory instruments) and develop, and implement a waste oil master plan for harbours in Tanga, Dar es Salaam and Mtwara. 2) Project management (includes construction management) 3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.

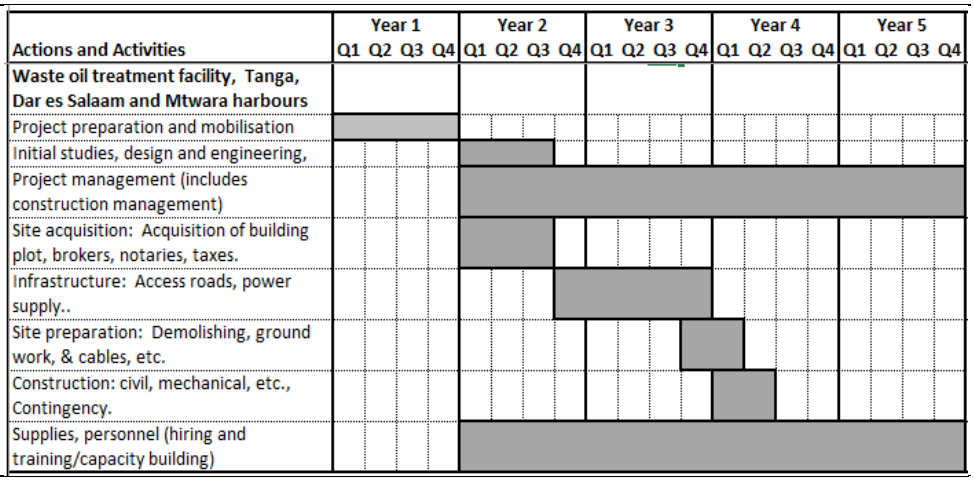
	4) Infrastructure: Access roads, power supply.. 5) Equipment: vehicles, compactors, incinerators, re-cycling.. 6) Site preparation: ground work, cables, roads 7) Construction: civil, mechanical, contingency. 8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)	
8. Assumptions:	The Tanzania Government is committed to supporting the clean-up of the coastal and natural environment. Local residents and businesses are supportive of initiatives to clean-up their coastal environment.	
9. Risks:	Local residents and businesses may object and manage to block the project.	
10. Means of implementation:	Logistics, technical, scientific	• Budgets for meetings • Budgets for technical assistance • Access to information Green-green infrastructure • …
	Human Resources	• Project managers • Civil and water engineers • Socio-economists, re-settlement specialists.. • …

11. Budget estimate:

Item	Estimate in USD
Project preparation and mobilisation	100,000
Initial studies, design and engineering,	200,000
Project management (includes construction management)	1,000,000
Site acquisition: Acquisition of building plot, brokers, notaries, taxes.	na
Infrastructure: Access roads, power supply..	5,000,000
Site preparation: Demolishing, ground work, & cables, etc.	1,000,000
Construction: civil, mechanical, etc., Contingency.	15,000,000
Supplies, personnel (hiring and training/capacity building)	2,000,000
Total	**24,300,000**

The coarse budget does not provide for site acquisition, re-housing or other costs associated with illegal squatters or land-users, which are considered a government issue.

12. Source of funding:	• Tanzania Government (budget, participation) • Private Sector (participation) • NGOs (participation) • Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes
13. Responsible for the action:	Strong Local Government department (e.g. DoE) capable of effectively coordinating efforts: • Harbour authorities in Tanga, Dar es Salaam and Mtwara • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (several million) plus foreign visitors (several thousand) in terms of enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation loss and smothering within inshore coastal waters. Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved coastal land stability which will better

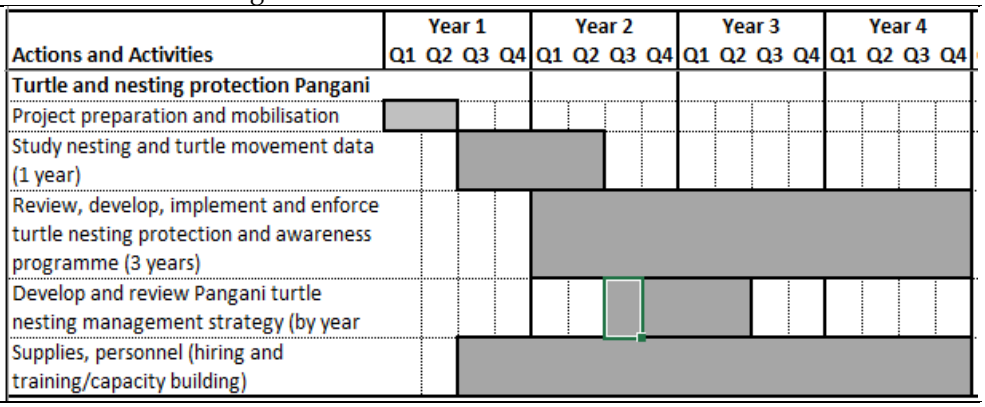
	their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L12: Sewage treatment facility for Tanga City • Tan-L16: Sewage treatment facility for Ilala • Tan-L23: Sewage treatment facility for Mtwara Urban • Tan-L52: Bagamoyo town planning
17. Performance indicators:	• Beach erosion loss from unsustainable land use reduced • Beach sand mining reduced • Local polices and guidelines for shoreline land use
18. Comments:	: Alignment of this proposed action with other initiatives addressing toxic and chemical wastes is recommended, for example with the project "Chemical accident prevention and preparedness programme for Tanzania" supported by UNEP, focused on capacity and implementation, with theGovernment Chemist Laboratory Agency (GLCA) (2013-2015).

Tan-L52: Turtle and nesting beach protection at Pangani District

1. Background:	The coastal zone of Tanzania is under development pressure from population growth and economic activities, but also from oceanic and weather influences that are thought to be contributing to coastal erosion. The population of the Tanga Region has reached its highest ever and development pressures on the coastline have reached unprecedented levels. Many locations along the coasts, at Pangani, suffer from coastal erosion, which may be further worsened by sand mining conducted by local villagers, the tourism sector and building material suppliers, as well as by some of the measures taken by beach hotels to mitigate the impacts of erosion, namely inappropriate sea defences. In Pangani District marine turtle nesting has been on the decline from loss of nesting beaches, from harvest of eggs and slaughter of females, and from loss of foraging grounds due to sedimentation and other causes. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. Maziwe Island was known for green, hawksbill and Olive Ridley turtle nesting in the 1970s. Although it is covered by water during high tide it is still a natural nesting site and turtles still frequent the area (see USAID, 2012). Madete beach, within Saadani NP, is a second very important turtle nesting site in Pangani (Wells et al., 2004). Tagging of a female green turtle from a Pangani beach revealed, during the first 78 days, important data on inter-nesting movement patterns and the home range of a gravid female who remained within 15 km of her nesting beach, suggesting it is likely that she went on to lay several more nests around the Panagani area after she was tagged (Seasense, 2014). With United States Agency for International Development (USAID) funding, the Pwani Project, led by the Coastal Resources Center at the University of Rhode Island and its local partner, Sea Sense, changed attitudes and behaviors of villagers living and working along the coastline of Pangani. Since 2009, local communities have recorded a progressively increasing number of sea turtle nests and hatchings. This effort has faltered through lack of funding and needs to be continued.
2. Title:	Turtle and nesting beach protection at Ushongo, Pangani District
3. Action Reference:	Tan-L52
4. Justification:	Along Ushongo beaches in Pangani and other sandy beaches and dune areas, the loss of turtle nesting and scale of slaughter was ranked at severity level 4. Other threats to turtles in this area include erosion, also ranked with severity value 4, with causes listed as due to mangrove cutting, dynamite fishing, beach sand mining and climate change. With the potential sea level rise for the coastline, if left unattended, the erosion problem affecting Pangani's coast will worsen, and without a concerted effort at protecting the nesting sites and sensitising local communities on the legal issues of turtle harvest and potential tourism losses, sea turtle populations in this areas a certain to continue to decline. This will also have a negative impact on the tourism sector.

<table>
<tr><td>5. Objective:</td><td>By 2025, turtle nesting and foraging in Pangani district coastal waters ensured with numbers increasing.</td></tr>
<tr><td>6. Expected outputs:</td><td>The outputs of the action to protect turtle nesting at Ushongo, Pangani, are:
• Understanding of the turtle nesting opportunities in Ushongo and the wider Pangani coast.
• Local team of beach recorders involved in monitoring beaches and increasing local awareness
• Turtle nesting success increases with time
• A Pangani turtle nesting management strategy is developed and accepted by local stakeholders.</td></tr>
<tr><td>7. Activities:</td><td>a) Project design and appraisal.
b) Project tendering
1) Study nesting and turtle movement data
2) Review, develop, implement and enforce turtle nesting protection and awareness programme.
3) Develop and review Pangani turtle nesting management strategy.</td></tr>
<tr><td>8. Assumptions:</td><td>The Tanzania Government is committed to supporting protecting of endangered species, enforcing relevant laws that impinge on the beaches, which are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to protect sea turtles.</td></tr>
<tr><td>9. Risks:</td><td>Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td>10. Means of implementation:</td><td><table><tr><td>Logistics, technical, scientific</td><td>• Field surveys
• …</td></tr><tr><td>Human Resources</td><td>• Turtle experts
• Local beach recorders
• Legal officers
• …</td></tr></table></td></tr>
<tr><td>11. Budget estimate:</td><td><table><tr><th>Item</th><th>Estimate in USD</th></tr><tr><td>Project preparation and mobilisation</td><td>20,000</td></tr><tr><td>Study nesting and turtle movement data (1 year)</td><td>20,000</td></tr><tr><td>Review, develop, implement and enforce turtle nesting protection and awareness programme (3 years)</td><td>100,000</td></tr><tr><td>Develop and review Pangani turtle nesting management strategy (by year 2)</td><td>10,000</td></tr><tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>20,000</td></tr><tr><td>Total</td><td>200,000</td></tr></table></td></tr>
<tr><td>12. Source of funding:</td><td>• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td>Strong Local Institution or NGO capable of effectively coordinating efforts:
• Turtle conservation experts
• Community participation experts
• Local beach recorders
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td>Local residents (several million) plus foreign visitors (several thousand) in terms of enhanced aesthetic aspects of the surrounding areas through the presence of nesting sea turtles.

Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved coastal biodiversity, more informed coastal population resulting in better opportunities for socio-economic</td></tr>
</table>

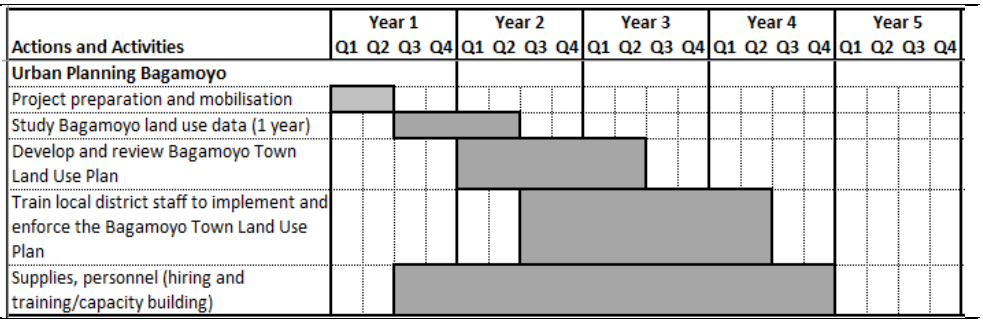
	development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review • Tan-S09: Support for Tourism Management Planning Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L49: Beach erosion study for coastal Tanzania
17. Performance indicators:	• Turtle nesting increased • Number of hatchings from Panagani increased • Number of slaughtered nesting females reduced • Numbers of turtles caught in local fishing gears reduced • Local network of beach recorders engaged an participating in monitoring and community awareness raising
18. Comments:	Note: An initiative related to marine turtles in Tanzania needs to be aligned with current efforts under the dedicated turtle-conservation NGO Sea Sense (www.seasense.org). References: Sea Sense, 2014. Annual Report. USAID 2012. USAID/Tanzania Quarterly Report, Q4 Reporting period: July 1-Sept 30, 2012 Project Name: Conservation of Coastal Eco-Systems in Tanzania: The PWANI Project. Wells, S., Juma, S., Muhando, C., Makota, V. and Agardy , T. 2004. Study on the Ecological Basis for Establishing a System of Marine Management Areas in The United Republic of Tanzania: Options for an MPA/MMA Network. Report prepared for the WORLD BANK, Tanzania Office. Vol 1 (58 pp) and Vol 2 (30 pp).

Tan-L53: Bagamoyo town planning

1. Background:	The coastal zone of Tanzania is under development pressure from population growth and economic activities, a phenomenon that is particularly acute in the Bagamoyo district. The of Bagamoyo exceeds 310,000 and the district has experienced a high average annual growth rate between 2002 and 2012 of 3.45 % leading to more than 42.30 % increase of the population over the ten-year period and documenting a significant in-migration. The population density in the district has grown to 37 persons/km2 in 2012 from 26 persons/km2 of 2002. Agriculture is the main economic activity in Bagamoyo District. Other economic activities in the area include fisheries, livestock keeping, tourism, trade, and small-scale industries. In 2011, Bagamoyo's Economic Processing Zone (EPZ) operators exported products worth more than USD 380 million, compared with USD 130 million-worth of exports in 2010. Processing activities are grouped in three main categories. These are agro products (fruits, textiles, cotton lint); precious minerals (lapidary), and leather industry products. Over recent years, Bagamoyo has served as the expansion area, which is absorbing the rapid growth of neighbouring Dar es Salaam city. This has lead to numerous conflicts of land use with the main feature being the loss of agricultural land for human settlements. The growth has been so fast and continuous that the local authorities have been unable to direct development efficiently. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The solution to unplanned development and land use is to first conduct a land use plan for the town of Bagamoyo, mindful of the likely continued need for settlement areas as the population will most likely continue to grow. New access roads and the planned new harbour at Bagamoyo will accelerate the process.
2. Title:	Bagamoyo town planning
3. Action Reference:	Tan-L53
4. Justification:	For Bagamoyo District, the loss of habitat and agricultural area was a threat ranked at the highest severity level 5. Causes include rapid urbanization, high increase of people immigration in the city. This action addresses the problem of land management in Bagamoyo, particularly the town and coastal areas. It will make recommendations that the district authorities can use to mitigate the problems they currently face.
5. Objective:	By 2025, the town planning of Bagamoyo is developed and implemented resulting in reduction in conflicts and loss of agricultural land to settlement.
6. Expected outputs:	The outputs of the action to protect turtle nesting at Ushongo, Pangani, are: • Understanding of the issues associated with Bagamoyo town land use • Mapping of appropriate land uses • Development of a Bagamoyo Town Land Use Plan • Local district staff trained in mapping and implementation of the Bagamoyo Town Land Use Plan • Agricultural land losses due to settlement decreases
7. Activities:	a) Project design and appraisal. b) Project tendering

<table>
<tr><td></td><td colspan="2">1) Study Bagamoyo land use data
2) Develop and review Bagamoyo Town Land Use Plan
3) Train local district staff in the implementation and enforcement of the Bagamoyo Town Land Use Plan</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting addressing coastal land use issues, enforcing relevant laws that impinge on the land, which are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to understand and mitigate land use conflicts and loss of agricultural land.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Satellite images
• Field surveys</td></tr>
<tr><td>Human Resources</td><td>• Civil and water engineers,
• Local planners
• Socio-economists,
• Resettlement specialists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2">
<table>
<tr><th>Item</th><th>Estimate in USD</th></tr>
<tr><td>Project preparation and mobilisation</td><td>50,000</td></tr>
<tr><td>Study Bagamoyo land use data (1 year)</td><td>100,000</td></tr>
<tr><td>Develop and review Bagamoyo Town Land Use Plan</td><td>100,000</td></tr>
<tr><td>Train local district staff to implement and enforce the Bagamoyo Town Land Use Plan</td><td>100,000</td></tr>
<tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>50,000</td></tr>
<tr><td>Total</td><td>400,000</td></tr>
</table>
The coarse budget does not provide for re-housing or other costs associated with illegal squatters or land-users, nor the implementation of legal measures to address illegal land occupation, which are considered government issues.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
<tr><td>13. Responsible for the action:</td><td colspan="2">Strong Local Government department capable of effectively coordinating efforts:
• Bagamoyo District Authorities
• Contractors
• NGOs
• etc…</td></tr>
<tr><td>14. Beneficiary from the action:</td><td colspan="2">Local residents (several million) plus foreign visitors (several thousand) in terms of enhanced aesthetic aspects of the surrounding areas; agricultural resources users (including fishers) from reduced loss from settlements.

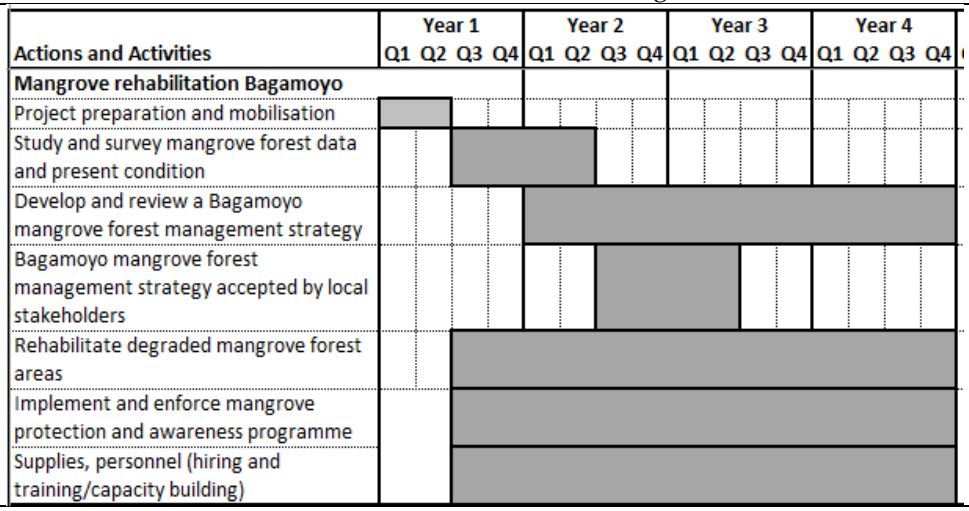
Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved land use stability which will better their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</td></tr>
</table>

15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review • Tan-S09: Support for Tourism Management Plannibng Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-L54: Mangrove rehabilitation at Bagamoyo
17. Performance indicators:	• Loss of agricultural land from unsustainable land use reduced • Conflict over land use reduced • Local polices and guidelines for land use
18. Comments:	

Tan-L54: Mangrove rehabilitation at Bagamoyo District

1. Background:	The coastal zone of Tanzania is under development pressure from population growth and economic activities, a phenomenon that is particularly acute in the Bagamoyo district. The of Bagamoyo exceeds 310,000 and the district has experienced a high average annual growth rate between 2002 and 2012 of 3.45 % leading to more than 42.30 % increase of the population over the ten-year period and documenting a significant in-migration. The population density in the district has grown to 37 persons/km2 in 2012 from 26 persons/km2 of 2002. Agriculture is the main economic activity in Bagamoyo District. Other economic activities in the area include fisheries, livestock keeping, tourism, trade, and small-scale industries. In 2011, Bagamoyo's Economic Processing Zone (EPZ) operators exported products worth more than USD 380 million, compared with USD 130 million-worth of exports in 2010. Processing activities are grouped in three main categories. These are agro products (fruits, textiles, cotton lint); precious minerals (lapidary), and leather industry products. Over recent years, Bagamoyo has serves as the expansion areas, which is absorbing the rapid growth of neighbouring Dar es Salaam city. This has lead to numerous conflicts of land use with the main feature being the loss of agricultural land for human settlements. Loss and degradation of mangrove forests in Bagamoyo has accompanied the expansion of the town. The growth has been so fast and continuous that the local authorities have been unable to direct development efficiently. The Government of Tanzania with World Bank assistance has through the project "Investment Prioritisation for Resilient Livelihoods and Ecosystems in Coastal Zones of Tanzania" embarked on identifying and prioritising threats with the view of developing fundable adaptation measures to address the most pertinent threats. The solution to unplanned development and land use is to first conduct a land use plan for the town of Bagamoyo, mindful of the likely continued need for settlement areas as the population will most likely continue to grow. New access roads and the planned new harbour at Bagamoyo will accelerate the process. This issue of land use planning is addressed under proposed action Tan-L52 (above). The present action addresses the need to reinstate lost or degraded mangrove forests.
2. Title:	Mangrove rehabilitation at Bagamoyo District
3. Action Reference:	Tan-L54
4. Justification:	Loss of mangrove forest in Bagamoyo was ranked with severity value 3, with sites including Utondwe creek, Wami and Ruvu River mouth, Bagamoyo Town to Mpiji River mouth. Causes included illegal and uncontrolled cutting of mangroves and salt production. Furthermore, a threat associated with coastal erosion at Bagamoyo was ranked at severity level 5, the highest, due to mangrove cutting, dynamite fishing, beach sand mining and unplanned construction along the coast. Meanwhile the decline in fisheries, ranked at severity level 4, is also attributed, among other things, to mangrove habitat loss. With the constant increasing population of Bagamoyo, and the potential sea level rise for the coastline, if left unattended, mangrove forest loss will contribute to more coastal erosion, continued reduction ion fisheries productivity, and a negative visual impact on the tourism sector.

<table>
<tr><td>5. Objective:</td><td colspan="2">By 2025, shoreline development planning and control adequately take erosion and accretion processes into account.</td></tr>
<tr><td>6. Expected outputs:</td><td colspan="2">The outputs of the action to rehabilitate mangrove forests at Bagamoyo, are:
• Quantifying the area under threat
• Development of a local team of mangrove restoration workers involved in rehabilitation and monitoring mangroves and increasing local awareness
• Mangrove forest cover loss is decreased.
• A Bagamoyo mangrove forest management strategy is developed and accepted by local stakeholders.</td></tr>
<tr><td>7. Activities:</td><td colspan="2">a) Project design and appraisal.
b) Project tendering
1) Study and survey mangrove forest data and present condition
2) Develop and review a Bagamoyo mangrove forest management strategy
3) Have the Bagamoyo mangrove forest management strategy accepted by local stakeholders
4) Rehabilitate degraded mangrove forest areas
5) Implement and enforce mangrove protection and awareness programme.
6) Develop local capacity to continue mangrove protection in Bagamoyo.</td></tr>
<tr><td>8. Assumptions:</td><td colspan="2">The Tanzania Government is committed to supporting protecting of mangroves, enforcing relevant laws that impinge on such protection, which are integral elements of integrated coastal zone management. Local residents and businesses are supportive of initiatives to protect mangroves.</td></tr>
<tr><td>9. Risks:</td><td colspan="2">Local residents and businesses may object and manage to block the project.</td></tr>
<tr><td rowspan="2">10. Means of implementation:</td><td>Logistics, technical, scientific</td><td>• Modelling
• Satellite images
• Marine instruments
• Field surveys</td></tr>
<tr><td>Human Resources</td><td>• Mangrove foresters
• Local planners
• Socio-economists
• …</td></tr>
<tr><td>11. Budget estimate:</td><td colspan="2"><table><tr><th>Item</th><th>Estimate in USD</th></tr><tr><td>Project preparation and mobilisation</td><td>50,000</td></tr><tr><td>Study and survey mangrove forest data and present condition</td><td>500,000</td></tr><tr><td>Develop and review a Bagamoyo mangrove forest management strategy</td><td>100,000</td></tr><tr><td>Bagamoyo mangrove forest management strategy accepted by local stakeholders</td><td>100,000</td></tr><tr><td>Rehabilitate degraded mangrove forest areas</td><td>100,000</td></tr><tr><td>Implement and enforce mangrove protection and awareness programme</td><td>50,000</td></tr><tr><td>Supplies, personnel (hiring and training/capacity building)</td><td>100,000</td></tr><tr><td>Total</td><td>5,500,000</td></tr></table>The coarse budget does not provide for re-housing or other costs associated with illegal squatters or land-users, nor the implementation of legal measures to address unauthorised mangrove harvest, or pollution, which are considered government issues.</td></tr>
<tr><td>12. Source of funding:</td><td colspan="2">• Tanzania Government (budget, participation)
• Private Sector (participation)
• NGOs (participation)
• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</td></tr>
</table>

13. Responsible for the action:	Strong Local Government department capable of effectively coordinating efforts: • Forestry Department • District mangrove officer • Contractors • NGOs • etc…
14. Beneficiary from the action:	Local residents (several million) plus foreign visitors (several thousand) in terms of enhanced aesthetic aspects of the surrounding areas; mangrove forest, intertidal and coral reefs resources users (including fishers) from reduced sedimentation loss and smothering within inshore coastal waters. Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved coastal land stability which will better their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.
15. Schedule:	
16. Links to other actions:	Links to following systemic actions would be desirable: • Tan-S01: Integrated Coastal Zone Management • Tan-S04: Information Management • Tan-S06: Awareness Raising • Tan-S07: Integrated Legal Review Of particular relevance and importance would be links to following systemic and local actions: • Tan-S02: Spatial Planning • Tan-S03: Shoreline Management • Tan-S08: Support for NEMC • Tan-L53: Bagamoyo town planning
17. Performance indicators:	• Mangrove loss from unsustainable land use reduced • Fisheries reduction reduced • Local polices and guidelines for shoreline land use
18. Comments:	