



**Coastal Profile for Zanzibar 2014  
Portfolio of Actions - Volume V  
Final Draft**



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





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## Acronyms<sup>1</sup>

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
CAS	Catch Assessment Survey
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

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<sup>1</sup> The list of abbreviations and acronyms has been compiled for all five volumes of the coastal profile.

GapCo	Gulf Africa Petroleum Corporation
GapOil	Retailers and marketer of petroleum products (GapCo subsidiary)
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 <sup>2</sup>	square kilometre
m	meter
m <sup>2</sup>	square meter
m <sup>3</sup>	cubic meter
Mm <sup>3</sup>	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/Regions, offering an overview of the situation in the coastal zone of each district/region, localising and adding detail to the information in Volume I. There are separate volumes for Mainland Tanzania by district and Zanzibar by region.

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 Zanzibar.

## **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 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 first 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 actions sheets for all prioritised actions.

## Methodological Approach

The study has adopted a sequential approach to formulating actions to promote sustainable coastal livelihoods and ecosystem 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 interventions requires further appraisals before decisions are made to develop full projects.

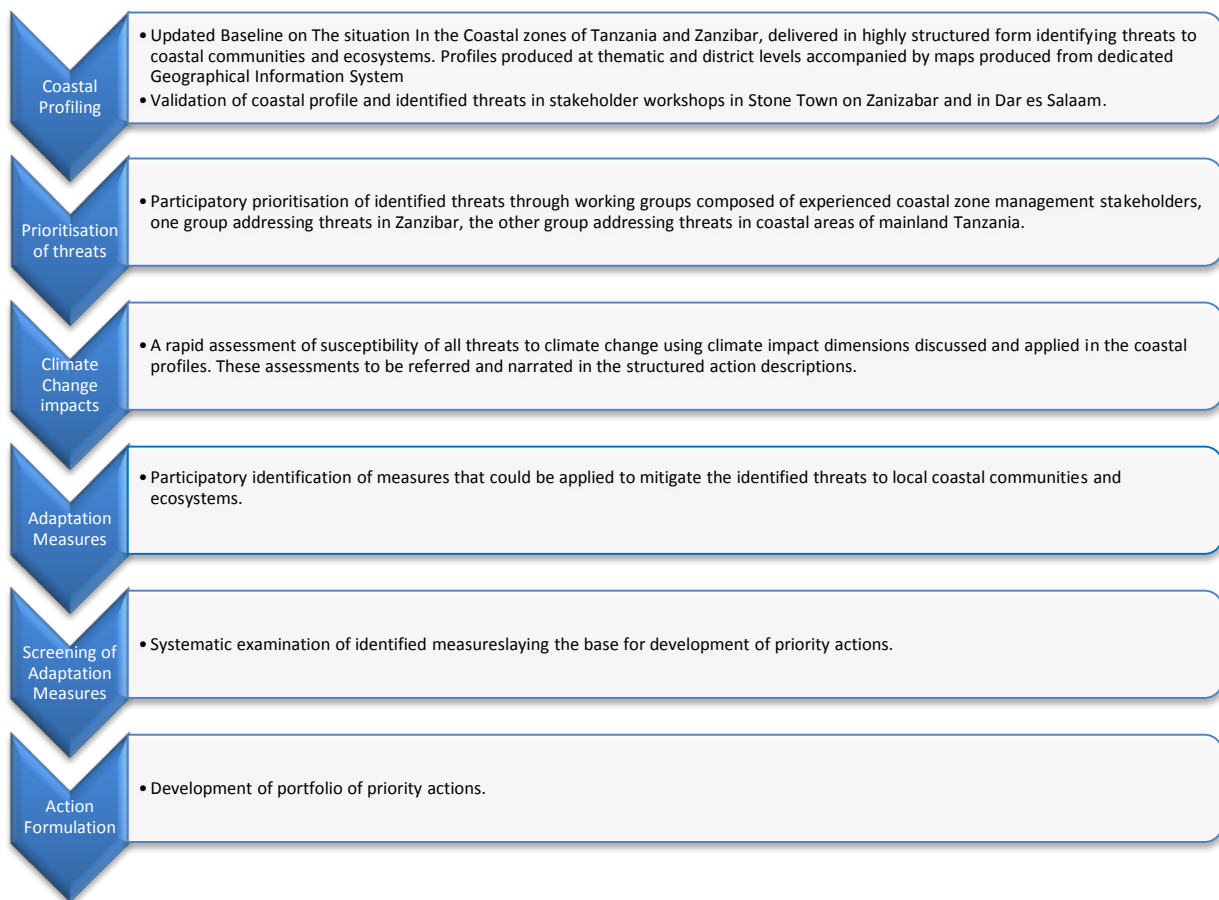


Figure 1: Sequence of study activities towards action formulation.

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 on 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 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 extent 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 has 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. More comprehensive validation of the coastal profiles were given 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 1 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

## **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 threats 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.

## **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 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<sup>2</sup>. Does the action measure have positive impact on other management challenges or opportunities?

Regret/No Regret<sup>3</sup>. 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<sup>4</sup>. Does the action measure make the management system more robust in responding to the threat and to 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 (planning horizons), lack of actions can eventually have huge implications on adaptation options and costs.

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

<sup>3</sup>'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.

<sup>4</sup>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.

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. 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 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 Zanzibar.

Table 1: Format for Action Sheets

Background:	<i>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.</i>	
Title:	<i>The title of the actions agreed upon in stakeholder dialogues.</i>	
Action Reference:	<i>Unique identifier for action database and other references.</i>	
Justification:	<i>Provide statements justifying that this action should be considered for funding. The statements can draw on the outcome of the prioritization and screening efforts.</i>	
Objective:	<i>Establish what the action if implemented is expected to achieve.</i>	
Expected outputs:	<i>Identify key outputs required to fulfil the objective.</i>	
Activities:	<i>List key activities that have to take place to produce the outputs.</i>	
Assumptions:	<i>State what assumptions concerning conditions outside the control of the action that must be met.</i>	
Risks:	<i>Identify risks that the source of funding and the responsible for the action should be aware of and try to mitigate.</i>	
Means of implementation:	Logistics, technical, scientific	<i>Outline expectations for logistic requirements, technical and scientific environment.</i>
	Human Resources	<i>Outline expectations on human resources engagement</i>
Budget estimate:	<i>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</i>	
Source of funding:	<i>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.</i>	
Responsible for the action:	<i>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.</i>	
Beneficiary from the action:	<i>Make qualitative assessment of beneficiary (ies). Quantitative assessment of beneficiary (ies) can at best made in very broad terms until appraisal.</i>	
Schedule:	<i>Indicate a time schedule for the implementation of the action The time schedule overarching the actions is 5 years.</i>	
Links to other actions:	<i>Identify and explain linkages to other actions</i>	
Performance indicators:	<i>Identify verifiable performance indicators that can be used to monitor the implementation of the action.</i>	
Comments:	<i>Provide any comments that are considered useful for the considerations by funding sources and institutions responsible for the action.</i>	

## 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 30 prioritised actions have been identified and included in this portfolio of action sheets, out of which 7 are considered systemic and 23 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 3 below lists and summarises these actions by type, name, location and total cost. The total budget for all 30 actions adds up to USD 270,150,000. Projects are of various sizes cost wise as indicated in Table 2.

Table 2: Number of projects grouped by budget size.

Budget Size group	Below 2 million USD	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 in in budget size group	8 actions	7 actions	9 actions	2 actions	4 actions

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 period 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 Zanzibar

Type	Action Title	Location	Action ID	Cost USD
Systemic	Integrated Coastal Zone Management Framework for Zanzibar	Unguja and Pemba	Zan-S01	1.700.000
Systemic	Integrated Spatial Planning	Unguja and Pemba	Zan-S02	2.300.000
Systemic	Shoreline Management Policy Framework	Unguja and Pemba	Zan-S03	1.200.000
Systemic	Information System as Decision Support for Coastal Development Management	Unguja and Pemba	Zan-S04	1.300.000
Systemic	Primary and Secondary Education	Unguja and Pemba	Zan-S05	1.100.000
Systemic	Overall Awareness Raising	Unguja and Pemba	Zan-S06	2.200.000
Systemic	Integrated Review of Legal Framework for Coastal Development Management	Unguja and Pemba	Zan-S07	1.250.000
Rehabilitation of Rivers	Rehabilitation and clean-up of five west-flowing streams in Unguja Urban and West Region (North of Stone Town)	Unguja West	Zan-L01	8.500.000
Rehabilitation of Rivers	Rehabilitation and clean-up of three northwest-flowing streams in Unguja Urban and West Region (close to Mahonda)	Unguja West	Zan-L02	8.500.000
Erosion	Beach erosion study for Zanzibar (Pemba and Unguja)	Unguja and Pemba	Zan-L03	4.400.000
Sanitation	Sewage collection and treatment facilities for Stone Town, Unguja West and Urban	Unguja West	Zan-L04	24.300.000
Sanitation	Sewage collection and treatment facilities for the Zanzibar Town periphery	Unguja West	Zan-L05	34.300.000
Sanitation	Sewage collection and treatment facility at Nungwi Village and hotel areas, Unguja	Unguja North	Zan-L06	34.300.000
Sanitation	Sewage collection and treatment facility at Mkoani	Pemba South	Zan-L07	34.300.000
Sanitation	Sewage collection and treatment facility at Chake Chake	Pemba South	Zan-L08	34.300.000
Tourism	Professional Tourism Training Centre for Zanzibar	Unguja over-arching	Zan-L09	6.200.000
Waste Management	Regional solid waste collection and processing facility, Pemba North	Unguja North	Zan-L10	6.800.000
Waste Management	Regional solid waste collection and processing facility, Pemba South	Pemba South	Zan-L11	6.800.000
Waste Management	Regional solid waste collection and processing facility, Unguja North	Unguja North	Zan-L12	6.800.000
Waste Management	Regional solid waste collection and processing facility, Unguja West & Urban	Unguja West	Zan-L13	12.100.000
Waste Management	Regional solid waste collection and processing facility, Unguja South	Unguja South	Zan-L14	6.800.000
Water Supply	Study, review and design of freshwater supply options for Pemba	Pemba	Zan-L15	5.500.000
Water Supply	Study, review and design of freshwater supply options for Unguja	Unguja North	Zan-L16	6.700.000
Fisheries	Zanzibar fisheries sector review by fishery types and management areas	Over-arching	Zan-L17	3.200.000
Fisheries	Zanzibar small pelagic fisheries support on Zanzibar	Over-arching	Zan-L18	1.700.000
Fisheries	Support for Zanzibar fisheries monitoring, control and surveillance programme	Over-arching	Zan-L19	4.800.000
Fisheries	Strengthening management of octopus fisheries on Zanzibar	Over-arching	Zan-L20	1.000.000

Type	Action Title	Location	Action ID	Cost USD
Fisheries	Strengthening seaweed farming in Zanzibar	Over-arching	Zan-L21	1.000.000
Fisheries	Semi-industrial offshore tuna fisheries support programme	Unguja North	Zan-L22	2.400.000
Fisheries	Strengthening fish mariculture in Zanzibar	Over-arching	Zan-L23	4.400.000
			Totals	270.150.000

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

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
<b>Grand Total</b>	<b>All</b>	<b>270,150,000</b>																									
<b>ICZM Framework</b>	<b>Zan-S01</b>																										
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		100,000																									
3) Establish/update ICZM Baseline		500,000																									
4) ICZM Policy		200,000																									
5) ICZM Action Plan		300,000																									
6) Capacity Building		400,000																									
<b>ICZM Framework Total</b>	<b>Total</b>	<b>1,700,000</b>																									
<b>Spatial Planning</b>	<b>Zan-S02</b>																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
1) Establish/activate inter-sector technical working committees/groups at Zanzibar and region levels for spatial planning		50,000																									
2) Baseline on state of the spatial planning in Zanzibar		50,000																									
3) Spatial planning policy/strategy		100,000																									
4) Situational analysis for spatial planning in Zanzibar and Pemba		500,000																									
5) Examine development scenarios for Pemba and Zanzibar		500,000																									
6) Prepare regional spatial plan for Zanzibar and Pemba pursuing preferred development scenario		500,000																									
7) Capacity building		500,000																									
<b>Spatial Planning Total</b>	<b>Total</b>	<b>2,300,000</b>																									
<b>Shoreline Management</b>	<b>Zan-S03</b>																										
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		200,000																									
2) Identify vulnerable areas for detailed shoreline management planning.		200,000																									
3) Vulnerability assessment through Shoreline Management Study and Plan.		200,000																									
4) Identify and quantify erosion/accretion along the coast and translate into management policies and strategies taking projected sea level rise into account.		200,000																									



Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10	
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
5) Mainstream shoreline management planning into land use/local planning.		100,000																										
6) Capacity building		200,000																										
<b>Shoreline Management</b>	<b>Total</b>	<b>1,200,000</b>																										
<b>Information Management</b>	<b>Zan-S04</b>																											
a) Project design and appraisal		50,000																										
b) Project mobilisation		50,000																										
1) Establishment of technical committee		50,000																										
2) Information needs assessment		50,000																										
3) Strategy development		50,000																										
4) Meta database development		50,000																										
5) Updating/consolidating shared database		500,000																										
6) Capacity building		500,000																										
<b>Information Management</b>	<b>Total</b>	<b>1,300,000</b>																										
<b>Education in Primary and Secondary</b>	<b>Zan-S05</b>																											
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		100,000																										
6) Train teachers		100,000																										
7) Test revised curricula in testing schools		200,000																										
8) Evaluate test		50,000																										
9) Capacity building		200,000																										
10) Expansion of programme		100,000																										
<b>Education in Primary and Secondary Schools</b>	<b>Total</b>	<b>1,100,000</b>																										
<b>Awareness Raising</b>	<b>Zan-S06</b>																											
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		150,000																										
8) Awareness raising programme implementation		1,000,000																										

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
9) Impact evaluation among target groups		100,000																									
10) Capacity building		500,000																									
<b>Awareness Raising</b>	<b>Total</b>	<b>2,200,000</b>																									
<b>Integrated Legal Review</b>	<b>Tan-S07</b>																										
a) Project design and appraisal		50,000																									
b) Project mobilisation		50,000																									
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																									
<b>Integrated Legal Review</b>	<b>Total</b>	<b>1,250,000</b>																									
<b>Five river basins rehabilitation UnjW</b>	<b>Zan-L01</b>																										
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		4,000,000																									
4) Increase awareness among households to avoid dumping waste in streams		100,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		500,000																									
<b>Five river basins rehabilitation UnjW</b>	<b>Total</b>	<b>8,500,000</b>																									
<b>Three river basins rehabilitation UnjW</b>	<b>Zan-L02</b>																										
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		4,000,000																									

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
4) Increase awareness among households to avoid dumping waste in streams		100,000																									
5) Develop, review and implement a river basin waste management strategy		300,000																									
6) Design appropriate stream management involving local partners and secure sustainability		500,000																									
<b>Three river basins rehabilitation UnjW</b>	<b>Total</b>	<b>8,500,000</b>																									
<b>Beach erosion study for Zanzibar</b>	<b>Tan-L03</b>																										
a) Project preparation and mobilisation		200,000																									
1) Study erosion/accretion processes		1,500,000																									
2) Review, develop, implement/enforce laws		200,000																									
3) Re-habilitate natural erosion soft barriers		2,000,000																									
4) Develop/review beach management strategy		500,000																									
Local capacity building																											
<b>Beach erosion study for Zanzibar</b>	<b>Total</b>	<b>4,400,000</b>																									
<b>Sewage facilities for Zanzibar Stone Town</b>	<b>Zan-L04</b>																										
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.																											
Connection existing 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																									
<b>Sewage facilities for Zanzibar Stone Town</b>	<b>Total</b>	<b>24,300,000</b>																									
<b>Sewage facilities for Zanzibar Town periphery</b>	<b>Zan-L05</b>																										
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																									

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			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																									
<b>Sewage facilities for Zanzibar Town periphery</b>	<b>Total</b>	<b>34,300,000</b>																									
<b>Sewage facilities for Nungwi and hotels</b>	<b>Zan-L06</b>																										
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																									
<b>Sewage facilities for Nungwi and hotels</b>	<b>Total</b>	<b>34,300,000</b>																									
<b>Sewage facilities for Mkoani town</b>	<b>Zan-L07</b>																										
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																									
<b>Sewage facilities for Mkoani town</b>	<b>Total</b>	<b>34,300,000</b>																									
<b>Sewage facilities for Chake Chake town</b>	<b>Zan-L08</b>																										
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																									

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			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																									
<b>Sewage facilities for Chake Chake town</b>	<b>Total</b>	<b>34,300,000</b>																									
<b>Professional Tourism Training Centre for Zanzibar</b>	<b>Zan-L09</b>																										
Project preparation and mobilisation		100,000																									
Mobilisation/design of PTTC requirements		400,000																									
Project management		500,000																									
Needs assessment in tourism industry		100,000																									
Equipment purchase and import etc.		1,000,000																									
Construction of facilities		2,000,000																									
Course designs		100,000																									
Student recruitment and courses start-up																											
Supplies, personnel (hiring and training/capacity building)		2,000,000																									
<b>Professional Tourism Training Centre for Zanzibar</b>	<b>Total</b>	<b>6,200,000</b>																									
<b>Solid waste collection/processing Pemba N</b>	<b>Zan-L10</b>																										
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																									
<b>Solid waste collection/processing Pemba N</b>	<b>Total</b>	<b>6,800,000</b>																									
<b>Solid waste collection/processing Pemba S</b>	<b>Zan-L11</b>																										
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																									
<b>Solid waste collection/processing Pemba S</b>	<b>Total</b>	<b>6,800,000</b>																									
<b>Solid waste collection/processing Unguja North</b>	<b>Zan-L12</b>																										

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			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 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																									
<b>Solid waste collection/processing Unguja North</b>	<b>Total</b>	<b>6,800,000</b>																									
<b>Solid waste collection/processing Unguja West and Urban</b>	<b>Zan-L13</b>																										
Project preparation and mobilisation		100,000																									
Mobilisation/ review of solid waste generation and design of specific needs		300,000																									
Project management		700,000																									
Waste processing site acquisition:																											
Infrastructure		1,500,000																									
Equipment		3,000,000																									
Site preparation: ground work, roads		3,000,000																									
Construction: civil, mechanical, contingency.		2,000,000																									
Supplies, personnel (hiring and training/capacity building)		1,500,000																									
<b>Solid waste collection/processing Unguja West and Urban</b>	<b>Total</b>	<b>12,100,000</b>																									
<b>Solid waste collection/processing Unguja South</b>	<b>Zan-L14</b>																										
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																									
<b>Solid waste collection/processing Unguja South</b>	<b>Total</b>	<b>6,800,000</b>																									
<b>Freshwater supply options for Pemba</b>	<b>Zan-L15</b>																										
Project preparation and mobilisation		100,000																									

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
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																									
<b>Freshwater supply options for Pemba</b>	<b>Total</b>	<b>5,500,000</b>																									
<b>Freshwater supply options for Unguja</b>	<b>Zan-L16</b>																										
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																									
<b>Freshwater supply options for Unguja</b>	<b>Total</b>	<b>6,700,000</b>																									
<b>Zanzibar fisheries sector review by fishery type and management areas</b>	<b>Zan-L17</b>																										
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 - groundtruthing		200,000																									
Implement improved catch assessment survey (CAS)		400,000																									
Develop fisheries management plans (x4)		1,000,000																									
Review and revise Fisheries Act (2010)		200,000																									
Implement Fisheries Management Plans																											
Supplies, personnel (hiring and training/capacity building)		500,000																									
<b>Zanzibar fisheries sector review by fishery type and management areas</b>	<b>Total</b>	<b>3,200,000</b>																									
<b>Small pelagic fisheries support on Zanzibar</b>	<b>Zan-L18</b>																										
Project preparation and mobilisation		100,000																									
Review of small pelagic catch records																											
Project management		200,000																									
Conduct frame survey, focused on small pelagic fishery																											
Collect additional catch/effort data - groundtruthing for small pelagics																											

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			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																											
Develop small pelagics fisheries management plan																											
Implement small pelagics Fisheries Management Plan																											
Work with fishing units (50)		500,000																									
Conduct feasibility study for sardine cannery		100,000																									
Assess seasonal changes and model vs climate/oceanographic parameters		300,000																									
Supplies, personnel (hiring and training/capacity building)		500,000																									
<b>Small pelagic fisheries support on Zanzibar</b>	<b>Total</b>	<b>1,700,000</b>																									
<b>Zanzibar fisheries MCS programme</b>	<b>Z-19</b>																										
Project preparation and mobilisation		100,000																									
Project management		200,000																									
Communication of revised Fisheries Act to fishers		50,000																									
Launch pilot project of registration and licencing for tuna and small pelagic fisheries		400,000																									
Expansion of pilot project for tuna and small pelagic		1,000,000																									
CFCs and district officers trained and supported		300,000																									
Research mechanisms on sustainability funding		50,000																									
Launch pilot project of registration and licencing for mixed reef and octopus fisheries		400,000																									
Expand pilot project for mixed reef and octopus fishery		1,000,000																									
CFCs and district officers trained and supported		300,000																									
Supplies, personnel (hiring and training/capacity building)		1,000,000																									
<b>Zanzibar fisheries MCS programme</b>	<b>Total</b>	<b>4,800,000</b>																									
<b>Strengthening management of octopus fisheries on Zanzibar</b>	<b>Z-20</b>																										
Project preparation and mobilisation		100,000																									
Review of small octopus catch records																											
Project management		200,000																									
Conduct frame survey, focused on octopus fishery																											
Collect additional catch/effort data - groundtruthing for octopus		200,000																									
Implement improved catch assessment survey (CAS) for octopus fishery																											
Develop octopus fisheries management plan																											
Implement octopus Fisheries Management Plan																											



Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			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																									
<b>Strengthening management of octopus fisheries on Zanzibar</b>	<b>Total</b>	<b>1,000,000</b>																									
<b>Strengthening seaweed farming on Zanzibar</b>	<b>Z-21</b>																										
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		50,000																									
Develop seaweed farming management plan																											
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)		200,000																									
Equipment, supplies, personnel (hiring and training/capacity building)		100,000																									
<b>Strengthening seaweed farming on Zanzibar</b>	<b>Total</b>	<b>1,000,000</b>																									
<b>Tuna fisheries support for Zanzibar</b>	<b>Z-22</b>																										
Project preparation and mobilisation		100,000																									
Review of tuna catch records																											
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																											
Develop tuna pelagics fisheries management plan																											
Implement tuna Fisheries Management Plan																											
Work with fishing units (10)		200,000																									
Trial FADs		200,000																									
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																									

Actions and Activities	Activity ID	Budget USD	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
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																									
<b>Tuna fisheries support for Zanzibar</b>	<b>Total</b>	<b>2,400,000</b>																									
Actions and Activities	ID		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
<b>Fish farming research and cage trials on Pemba</b>	<b>Z-23</b>																										
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		50,000																									
Facility designed and constructed		1,000,000																									
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 small-scale feed production		100,000																									
Feasibility study for Pemba Aquaculture Training Centre		50,000																									
Equipment, supplies, personnel (hiring and training/capacity building)		1,500,000																									
<b>Fish farming research and cage trials on Pemba</b>	<b>Total</b>	<b>4,400,000</b>																									

## Zan-S01 Integrated Coastal Zone Management Framework

<p><b>1. Background:</b></p>	<p>Zanzibar 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.</p> <p>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.</p> <p>There are 5 regions in Zanzibar all bordering the Indian Ocean. The population totalled 1,303,569 people in 2012 or around 15% of the country’s total population. The combined area of these regions is 2,507 km<sup>2</sup>. The population density is 520 persons/km<sup>2</sup> which is roughly around ten times the density for the whole country of 50 persons/km<sup>2</sup>. Zanzibar has experienced an average annual population growth of around 3.1% between 2002 and 2012.</p>
<p><b>2. Title:</b></p>	<p>Integrated Coastal Management Framework for Zanzibar</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-S01</p>
<p><b>4. Justification:</b></p>	<p>The working group in Stone Town found that in Zanzibar the mitigation of</p> <ul style="list-style-type: none"> <li>• 53 out of the 106 identified thematic threats to local coastal communities and ecosystems in Zanzibar corresponding to 50%, and</li> <li>• 36 out of the 36 identified district level threats to local coastal communities corresponding to 100%,</li> </ul> <p>would benefit from an Integrated Coastal Management Framework providing for better coordination within government and between government and non-government organisations.</p> <p>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 addressing 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.</p>
<p><b>5. Objective:</b></p>	<p>The objectives of the Integrated Coastal Management Framework Action are</p> <ul style="list-style-type: none"> <li>• Fora for coordinated management of the development in the coastal zone of Zanzibar established overall and at region level.</li> <li>• System for updating baseline descriptions of the situation in the coast in place and two structured biannual State of the Coast Reports generated overall for Zanzibar and for the regions in support of development planning</li> </ul>

	<ul style="list-style-type: none"> <li>• Direction for coordinated development management provided through policy development and action planning, aligned with existing policies and development planning.</li> </ul>																	
<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• Two consecutive ICZM Baselines for Zanzibar (State of the Coast Reports)</li> <li>• ICZM Policy for Zanzibar</li> <li>• ICZM Action Plan for Zanzibar</li> <li>• ICZM Coordination Platforms overall and at region level</li> </ul>																	
<b>7. Activities:</b>	a) Project design and appraisal. b) Project tendering 1) Mobilisation of ICZM Platforms 2) Establish/update ICZM Baselines for Zanzibar 3) ICZM Policy development for Zanzibar 4) ICZM Action Plan preparation for Zanzibar 5) Capacity Building																	
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.																	
<b>9. Risks:</b>	Non engagement from stakeholders and unwillingness to share experience and information.																	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Venues for regular ICZM Platform meetings</li> <li>• Secretariats for ICZM Platforms</li> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information</li> </ul>																
	Human Resources	<ul style="list-style-type: none"> <li>• High level participation in ICZM Coordination Platform at decision making level from Government and non-Government stakeholders.</li> <li>• Involvement of technical staff in activities under the ICZM Platforms, i.e. ICZM Baseline, ICZM Policy, ICZM Action Plan</li> </ul>																
<b>11. Budget estimate:</b>	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 border="1"> <thead> <tr> <th>Item</th> <th>Estimate in USD</th> </tr> </thead> <tbody> <tr> <td>Project preparation and mobilisation</td> <td>100,000</td> </tr> <tr> <td>Mobilisation and operation of ICZM platforms</td> <td>200,000</td> </tr> <tr> <td>First and second updated ICZM Baselines</td> <td>500,000</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>1700,000</td> </tr> </tbody> </table>		Item	Estimate in USD	Project preparation and mobilisation	100,000	Mobilisation and operation of ICZM platforms	200,000	First and second updated ICZM Baselines	500,000	ICZM Policy development	200,000	ICZM Action Plan	300,000	Capacity building	400,000	Total	1700,000
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ICZM Action Plan	300,000																	
Capacity building	400,000																	
Total	1700,000																	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation, meeting premises, secretariat)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> </ul>																	

	<ul style="list-style-type: none"> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																		
<b>13. Responsible for the action:</b>	<p>Strong Government coastal development stakeholder capable of effectively chairing the coordination efforts:</p> <p>High-level members of the ICZM Coordination Platform from</p> <ul style="list-style-type: none"> <li>• Government Ministries</li> </ul>																																																																																																																																																																																																																																		
<b>14. Beneficiary from the action:</b>	<p>Key beneficiaries will be senior management and technical staff in government institutions that have management responsibilities related to development in the coastal areas.</p> <p>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.</p>																																																																																																																																																																																																																																		
<b>15. Schedule:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Actions and Activities</th> <th rowspan="2">ID</th> <th colspan="4">Year 1</th> <th colspan="4">Year 2</th> <th colspan="4">Year 3</th> <th colspan="4">Year 4</th> <th colspan="4">Year 5</th> </tr> <tr> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> </tr> </thead> <tbody> <tr> <td><b>ICZM Framework</b></td> <td><b>Tan-S01</b></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>a) Project design and appraisal</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>b) Project mobilisation (tendering)</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>1) Mobilisation of ICZM Platform</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>2) Establish/update ICZM Baseline</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>3) ICZM Policy</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>4) ICZM Action Plan</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>5) Capacity Building</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>	Actions and Activities	ID	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	<b>ICZM Framework</b>	<b>Tan-S01</b>																						a) Project design and appraisal																							b) Project mobilisation (tendering)																							1) Mobilisation of ICZM Platform																							2) Establish/update ICZM Baseline																							3) ICZM Policy																							4) ICZM Action Plan																							5) Capacity Building																						
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<b>16. Links to other actions:</b>	<p>This action is of importance to all other actions in providing:</p> <ul style="list-style-type: none"> <li>• A forum for systematic cross sector coordination.</li> </ul> <p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> <li>• Zan-S07: Integrated Legal Review</li> </ul>																																																																																																																																																																																																																																		
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Legislation empowering the ICZM Coordination Platforms</li> <li>• Minutes of meetings in the ICZM Coordination Platforms</li> <li>• Regular validated Baselines (State of the Zanzibar Coast Reports)</li> <li>• Validated Zanzibar ICZM Policy</li> <li>• Validated Zanzibar ICZM Plan</li> </ul>																																																																																																																																																																																																																																		
<b>18. Comments:</b>	<p>Zanzibar 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.</p>																																																																																																																																																																																																																																		

## Zan-S02 Spatial Planning

<p><b>1. Background:</b></p>	<p>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.</p> <p>Zanzibar 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.</p> <p>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.</p> <p>An overall spatial development strategy and plan for Zanzibar are important entry points for mainstreaming climate change adaptation measures into 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.</p>
<p><b>2. Title:</b></p>	<p>Integrated Spatial Planning</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-S02</p>
<p><b>4. Justification:</b></p>	<p>The working group in Stone Town found that in Zanzibar the mitigation of</p> <ul style="list-style-type: none"> <li>• 69 out of 106 identified thematic threats to local coastal communities and ecosystems in Zanzibar corresponding to 65%, and</li> <li>• 36 out of 36 identified region threats to local coastal communities and ecosystems corresponding to 100%</li> </ul> <p>would benefit from strengthened spatial planning providing for sustainable land use and development control.</p> <p>Support to land use planning has been provided to Zanzibar through the Sustainable Management of Land and Environment programme over several periods. The programme has recently completed its second phase (SMOLE II). Support has also 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.</p>

<b>5. Objective:</b>	Spatial planning in Zanzibar capacitated and spatial plans updated and used in development control.	
<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• State of the spatial planning in Zanzibar</li> <li>• Spatial development strategy in line with national structure planning</li> <li>• Regional Spatial Plans for Pemba and Zanzibar</li> <li>• Capacitated spatial planning in Zanzibar</li> </ul>	
<b>7. Activities:</b>	a) Project design and appraisal. b) Project tendering 1) Establish/activate inter-sector technical working committees/groups at Zanzibar and region levels for spatial planning 2) Baseline on state of the spatial planning in Zanzibar 3) Spatial planning policy/strategy 4) Situational analysis for spatial planning in Zanzibar and Pemba 5) Examine development scenarios for Pemba and Zanzibar 6) Prepare spatial plan for Zanzibar and Pemba pursuing preferred development scenario 7) Capacity Building	
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to engaging in consolidating the spatial planning in Zanzibar	
<b>9. Risks:</b>	Reluctance/unwillingness to participate in spatial planning from other government institutions. Reluctance/unwillingness to exchange data and information required for spatial analysis.	
<b>10. Means of implementation :</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• GIS capabilities and themes</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Spatial planners</li> <li>• IT staff</li> <li>• Technical staff from other departments</li> <li>• Technical assistance</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	a) Project design and appraisal	50,000
	b) Project mobilisation	50,000
	1) Establish/activate inter-sector technical working committees/groups at Zanzibar and region levels for spatial planning	50,000
	2) Baseline on state of the spatial planning in Zanzibar	50,000
	3) Spatial planning policy/strategy	100,000
	4) Situational analysis for spatial planning in Zanzibar and Pemba	500,000
	5) Examine development scenarios for Pemba and Zanzibar	500,000
	6) Prepare regional spatial plan for Zanzibar and Pemba pursuing preferred development scenario	500,000
7) Capacity building	500,000	

	Total	2,300,000																																																																																																																																																																																																																																																																																																																																																
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation, meeting premises, secretariat)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																																																																																																																	
<b>13. Responsible for the action:</b>	Ministry of Water, Construction, Energy and Lands (MCWEL)  Support from other government department																																																																																																																																																																																																																																																																																																																																																	
<b>Beneficiary from the action:</b>	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 regional plans will have a spatial framework informing and directing land uses.																																																																																																																																																																																																																																																																																																																																																	
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<b>Links to other actions:</b>	This action is of importance to all other actions in addressing the need for updated quality information in support of: <ul style="list-style-type: none"> <li>• Decision making and planning, locally and overall</li> <li>• Informed dialogues between stakeholders</li> <li>• Transparency in decision-making</li> </ul> Of particular relevance and importance would be links to: <ul style="list-style-type: none"> <li>• Zan-S01: Integrated Coastal Zone Management Framework</li> <li>• Zan-S03: Shoreline Management</li> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> </ul>																																																																																																																																																																																																																																																																																																																																																	
<b>Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Strategy / policy for spatial planning</li> <li>• Spatial plans</li> <li>• People trained</li> </ul>																																																																																																																																																																																																																																																																																																																																																	
<b>Comments:</b>	The proposed action offers the resources to follow up on earlier initiatives (SMOLE and MACEMP) to reach a comprehensive regional plan level for Zanzibar and Pemba and in the process capacitating the Zanzibar planning system. The action is well suited to link closely with Zan-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 Zan-																																																																																																																																																																																																																																																																																																																																																	



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	S04. The action should also be informed by the policies and strategies emerging from Zan-S03: Shoreline Management.
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## Zan-S03 Shoreline Management

<b>1. Background:</b>	<p>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.</p> <p>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.</p> <p>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 Zanzibar to produce appropriate policies and strategies for adaptation to coastal erosion.</p>
<b>2. Title:</b>	Shoreline Management Policy Framework
<b>3. Action Reference:</b>	Zan-S03
<b>4. Justification:</b>	<p>The working group in Stone Town found that in Zanzibar the mitigation of</p> <ul style="list-style-type: none"> <li>• 47 out of the 106 identified thematic threats to local coastal communities and ecosystems in Zanzibar corresponding to 44%, and</li> <li>• 28 out of the 36 identified district level threats to local coastal communities corresponding to 78 %,</li> </ul> <p>would benefit from shoreline management interventions.</p> <p>A systematic assessment of the shorelines of Zanzibar and Pemba 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.</p>
<b>5. Objective:</b>	Spatial planning informed by policies for shoreline management
<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• Shoreline Management Plan for Zanzibar and Pemba</li> <li>• Policies for inclusion and consideration in regional planning</li> <li>• Institutions and staff capacitated within shoreline management</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1. Map and describe sediment cells and sub-cells along the coastline as basis for determining boundaries for Shoreline Management Planning areas.</li> <li>2. Identify vulnerable areas for detailed shoreline management planning.</li> </ol>

	<p>3. Vulnerability assessment through Shoreline Management Study and Plan.</p> <p>4. Identify and quantify erosion/accretion along the coast and translate into management policies and strategies taking projected sea level rise into account.</p> <p>5. Mainstream shoreline management planning into land use/local planning.</p> <p>6. Capacity building</p>	
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to engaging in shoreline management planning	
<b>9. Risks:</b>	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.	
<b>10. Means of implementation :</b>	Logistics, technical, scientific	Satellite imageries, Wave and current data, geomorphology of coast, river discharge statistics, meteorological data, numerical modelling, field surveying.
	Human Resources	Access to technical staff within the following fields: numerical modelling, GIS, hydrologist, hydro morphologist, coastal engineering.
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	a) Project design and appraisal	50,000
	b) Project mobilisation	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	200,000
	2) Identify vulnerable areas for detailed shoreline management planning.	200,000
	3.) Vulnerability assessment through Shoreline Management Study and Plan.	200,000
	4) Identify and quantify erosion/accretion along the coast and translate into management policies and strategies taking projected sea level rise into account.	200,000
	5) Mainstream shoreline management planning into land use/local planning.	100,000
	6) Capacity building	200,000
	<b>Total</b>	<b>1,200,000</b>
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation, information, meeting and working premises)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> </ul>	

	<ul style="list-style-type: none"> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																																																													
<b>13. Responsible for the action:</b>	<ul style="list-style-type: none"> <li>• Strong Government department capable of effectively coordinating efforts.</li> <li>• Government departments with stakes or mandates, experience and technical capacity related to shoreline management</li> </ul>																																																																																																																																																																																																																																																																																													
<b>14. Beneficiary from the action:</b>	<p>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.</p> <p>Key beneficiaries will be parties with interest in shoreline development being directed through explicit local policies and plans.</p> <p>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.</p>																																																																																																																																																																																																																																																																																													
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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.																																																																																																																																																																																																																																																																																														
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<b>16. Links to other actions:</b>	<p>This action is of importance to all other actions in addressing the need for updated quality information in support of:</p> <ul style="list-style-type: none"> <li>• Decision making and planning along the shorelines</li> <li>• Informed dialogues between stakeholders</li> <li>• Transparency in decision-making</li> </ul> <p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-S01: Integrated Coastal Zone Management Framework</li> <li>• Zan-S02: Spatial Planning</li> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> </ul>																																																																																																																																																																																																																																																																																													
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Shoreline management plan</li> <li>• Policies and regulations for shoreline uses</li> <li>• Regional spatial plans</li> </ul>																																																																																																																																																																																																																																																																																													
<b>18. Comments:</b>	<p>The action is well suited to link closely with Zan-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 Zan-S04. The action should also inform and feed into Zan-S02: Spatial Planning.</p>																																																																																																																																																																																																																																																																																													

## Zan-S04 Information Management

<p><b>1. Background:</b></p>	<p>Zanzibar 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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p><b>2. Title:</b></p>	<p>Information System as Decision Support for Coastal Development Management</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-S04</p>
<p><b>4. Justification:</b></p>	<p>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.</p> <p>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.</p>

	<p>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. Considerable efforts have been provided through the Sustainable Management of Land and Environment Programme (SMOLE) on assessing the current status of spatial data generation, storage and application and recommendations given on the requirements for consolidating the emerging Zanzibar Land Use Information System. This action should thoroughly consider and build on these and other initiative.</p>	
<b>5. Objective:</b>	<p>Shared information management system operational and supporting decision making and planning.</p>	
<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• Inter sector technical committee or working group charged with supporting information management</li> <li>• Baseline on current information management identifying information sources and information uses</li> <li>• Information needs analysis related to existing mandates</li> <li>• Strategy for coastal data infrastructure development aligned with national data infrastructure initiatives</li> <li>• Shared meta data base for coastal data management</li> <li>• Development and/update of base themes</li> <li>• Consolidated coastal information system</li> </ul>	
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Establishment of technical committee or working group composed of key users and providers of information for coastal development management</li> <li>2) Information needs assessment for coastal development management</li> <li>3) Strategy development</li> <li>4) Meta database development based on needs for coastal development management and including fields defining means for data exchange</li> <li>5) Consolidating Data</li> <li>6) Capacity Building.</li> </ol> </li> </ol>	
<b>8. Assumptions:</b>	<p>The Government of Tanzania is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.</p>	
<b>9. Risks:</b>	<p>Institutional unwillingness to exchange information. Corruption.</p>	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Venues and budgets for meetings in technical working group</li> <li>• Budgets for technical assistance</li> <li>• Sharing of information resources</li> <li>• IT infrastructure elements and software</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Participation in technical committee and/or working group from key users and providers of information systems</li> <li>• Technical staff from key users and providers of information systems in activities under this action</li> <li>• Technical assistance</li> </ul>

<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>																																																																																																																																																																																																																																																								
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<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation, meeting premises, secretariat)</li> <li>• Private IT Sector (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																									
<b>13. Responsible for the action:</b>	<p>Strong Government coastal development stakeholder capable of effectively chairing the coordination efforts required for sharing expertise and information resources</p> <p>Key users and providers of information systems</p>																																																																																																																																																																																																																																																									
<b>14. Beneficiary from the action:</b>	<p>Key beneficiaries will be:</p> <ul style="list-style-type: none"> <li>• decision makers related to coastal development to planning</li> <li>• users and producers of information</li> <li>• Private sector engaged in information generation</li> <li>• Schools</li> <li>• Universities</li> <li>• Public at large</li> </ul> <p>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.</p> <p>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.</p>																																																																																																																																																																																																																																																									
<b>15. Schedule:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Actions and Activities</th> <th rowspan="2">Activity ID</th> <th rowspan="2">Budget USD</th> <th colspan="3">Year 1</th> <th colspan="3">Year 2</th> <th colspan="3">Year 3</th> <th colspan="3">Year 4</th> <th colspan="3">Year 5</th> <th rowspan="2">Y6</th> <th rowspan="2">Y7</th> <th rowspan="2">Y8</th> <th rowspan="2">Y9</th> <th rowspan="2">Y10</th> </tr> <tr> <th>Q1</th> <th>Q2</th> <th>Q3</th> <th>Q4</th> <th>Q1</th> <th>Q2</th> <th>Q3</th> <th>Q4</th> <th>Q1</th> <th>Q2</th> <th>Q3</th> <th>Q4</th> <th>Q1</th> <th>Q2</th> <th>Q3</th> <th>Q4</th> </tr> </thead> <tbody> <tr> <td>Information Management</td> <td>Zan-S04</td> <td></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>a) Project design and appraisal</td> <td></td> <td>50,000</td> <td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>b) Project mobilisation</td> <td></td> <td>50,000</td> <td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>1) Establishment of technical committee</td> <td></td> <td>50,000</td> <td></td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>2) Information needs assessment</td> <td></td> <td>50,000</td> <td></td><td></td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>3) Strategy development</td> <td></td> <td>50,000</td> <td></td><td></td><td></td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>4) Meta database development</td> <td></td> <td>50,000</td> <td></td><td></td><td></td><td></td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>5) Updating/consolidating shared database</td> <td></td> <td>500,000</td> <td></td><td></td><td></td><td></td><td></td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>6) Capacity building</td> <td></td> <td>500,000</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>■</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>													Actions and Activities	Activity ID	Budget USD	Year 1			Year 2			Year 3			Year 4			Year 5			Y6	Y7	Y8	Y9	Y10	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Information Management	Zan-S04																					a) Project design and appraisal		50,000	■																			b) Project mobilisation		50,000		■																		1) Establishment of technical committee		50,000			■																	2) Information needs assessment		50,000				■																3) Strategy development		50,000					■															4) Meta database development		50,000						■														5) Updating/consolidating shared database		500,000							■													6) Capacity building		500,000								■											
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<b>17. Performance indicators:</b>	Updated Metadata from Information management system
<b>18. Comments:</b>	<p>Ensure thorough examination of past and on-going efforts linked to information management. Such efforts include ZALIA and SMOLE. The intension of this effort is to have a fuller scale focus on developing an information management system in Zanzibar as support to a fuller range of decision makers and planners, i.e. a Zanzibar Information Management System.</p>



## Zan-S05 Education in Primary and Secondary Schools

<b>1. Background:</b>	<p>Zanzibar 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.</p> <p>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.</p> <p>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.</p>
<b>2. Title:</b>	Primary and Secondary Education
<b>3. Action Reference:</b>	Zan-S05
<b>4. Justification:</b>	<p>The working group in Stone Town found that in Zanzibar the mitigation of</p> <ul style="list-style-type: none"> <li>• 76 out of the 106 identified thematic threats to local coastal communities and ecosystems in Zanzibar corresponding to 72%, and</li> <li>• 36 out of the 36 identified region level threats to local coastal communities corresponding to 100%,</li> </ul> <p>would benefit from interaction with education in primary and secondary schools.</p> <p>The working group in these discussion highlighted issues related to</p> <ul style="list-style-type: none"> <li>• Sustainable fisheries and fisheries ecology.</li> <li>• Importance of environmentally sound industrial production</li> <li>• Sustainable development in areas under high demographic and economic development pressure (coastal areas, urban areas).</li> <li>• Importance of coasts and coastal habitats and resources.</li> <li>• Importance of beaches.</li> <li>• Pollution, environment, health.</li> <li>• Waste minimisation and recycling.</li> <li>• Coastal forest ecology</li> <li>• Coastal forest management;</li> <li>• Hydrologic cycle</li> <li>• Importance of disease vector control.</li> <li>• Complex requirements in coastal areas (high population and economic pressure).</li> <li>• Sustainable development.</li> <li>• Spatial planning to service Population requirements.</li> <li>• Importance of environmentally sound agriculture production.</li> </ul>
<b>5. Objective:</b>	Education in primary and secondary schools aligned to develop a holistic understanding among students of the requirement to sustainable manage the coastal zones of Zanzibar

<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• Needs assessment for coastal dimension in education</li> <li>• A review current curricula for primary and secondary education</li> <li>• Revised curricula incorporating coastal issues</li> <li>• Teaching material for the revised curricula</li> <li>• Trained teachers in schools involved in developing and testing</li> <li>• Evaluation of test</li> <li>• Programme expansion</li> </ul>																													
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1. Establish coordination platform between Ministry of Education and to participate in action</li> <li>2. Needs assessment</li> <li>3. Review of existing curricula and its use</li> <li>4. Develop revised curricula incorporating coastal issues</li> <li>5. Develop teaching material</li> <li>6. Train teachers</li> <li>7. Test revised curricula in testing schools</li> <li>8. Evaluate test</li> <li>9. Capacity building</li> <li>10. Expansion of programme</li> </ol>																													
<b>8. Assumptions:</b>	Government of Zanzibar willing to revise curriculum for primary and secondary schools to better incorporate a holistic understanding of coastal development issues																													
<b>9. Risks:</b>	Schools not willing to engage in developing and testing revised curricula																													
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to curricula and schools</li> </ul>																												
	Human Resources	<ul style="list-style-type: none"> <li>• Staff from Ministry of Education</li> <li>• Staff from schools involved in testing</li> <li>• Technical assistance</li> </ul>																												
<b>11. Budget estimate:</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Item</th> <th style="width: 30%;">Estimate in USD</th> </tr> </thead> <tbody> <tr> <td>a) Project design and appraisal</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>b) Project mobilisation</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>1) Establish coordination platform between Ministry of Education and schools to participate in action</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>2) Needs assessment</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>3) Review of existing curricula and its use</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>4) Develop revised curricula incorporating coastal issues</td> <td style="text-align: right;">100,000</td> </tr> <tr> <td>5) Develop teaching material</td> <td style="text-align: right;">100,000</td> </tr> <tr> <td>6) Train teachers</td> <td style="text-align: right;">100,000</td> </tr> <tr> <td>7) Test revised curricula in testing schools</td> <td style="text-align: right;">200,000</td> </tr> <tr> <td>8) Evaluate test</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>9) Capacity building</td> <td style="text-align: right;">200,000</td> </tr> <tr> <td>10) Expansion of programme</td> <td style="text-align: right;">100,000</td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: right;"><b>1,100,000</b></td> </tr> </tbody> </table>		Item	Estimate in USD	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	100,000	6) Train teachers	100,000	7) Test revised curricula in testing schools	200,000	8) Evaluate test	50,000	9) Capacity building	200,000	10) Expansion of programme	100,000	<b>Total</b>	<b>1,100,000</b>
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<b>14. Beneficiary from the action:</b>	<ul style="list-style-type: none"> <li>Ministry of Education</li> <li>Teachers and staff in primary and secondary schools</li> <li>Students in Primary and Secondary Schools</li> <li>The population at large</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																																																						
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<b>16. Links to other actions:</b>	<p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>Zan-S04: Information Management</li> <li>Zan-S06: Awareness Raising</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																																																						
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## Zan-S06 Awareness Raising

<b>1. Background:</b>	<p>Zanzibar 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.</p> <p>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.</p> <p>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.</p>
<b>2. Title:</b>	<p>Overall Awareness Raising Strategy and Action</p>
<b>3. Action Reference:</b>	<p>Zan-S06</p>
<b>4. Justification:</b>	<p>The working group in Stone Town found that in Zanzibar the mitigation of</p> <ul style="list-style-type: none"> <li>• 85 out of the 106 identified thematic threats to local coastal communities and ecosystems in Mainland Tanzania corresponding to 80%, and</li> <li>• 36 out of the 36 identified district level threats to local coastal communities corresponding to 100 %,</li> </ul> <p>calls for increased awareness concerning coastal issues, in particular vulnerability and complexity of coastal systems facing development pressure and impacts from climate change.</p> <p>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. There is a requirement to develop and implement a comprehensive awareness raising effort.</p>
<b>5. Objective:</b>	<p>Shared understanding and awareness among coastal stakeholders about issues emerging from development pressure on coastal communities and ecosystems.</p>
<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• Stakeholder/Target Group Identification and Profile</li> <li>• Awareness Raising Strategy and Programme</li> <li>• Trained Staff (Public Relation in key departments)</li> <li>• Informed/“trained” press</li> <li>• Awareness Raising Campaigns</li> <li>• Impact evaluations</li> <li>• Aware stakeholders</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Stakeholder identification and profiling (targets for awareness)</li> <li>2) Stakeholder Assessment</li> </ol>

	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	
<b>8. Assumptions:</b>	Government of Zanzibar committed to empower coastal development stakeholders for more qualified dialogue, involvement and participation in coastal development management	
<b>9. Risks:</b>	Political pressure/interference to influence messages or message delivery	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Audio-visuals</li> <li>• Media</li> <li>• Press</li> <li>• Roadshow</li> <li>• Internet</li> <li>• ....</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Public relations staff in government departments Awareness raising specialist</li> <li>• Communication specialists</li> <li>• IT Specialist (internet etc)</li> <li>• Journalists and other media professionals</li> <li>• NGOs with awareness raisin competences linked to coastal issues</li> <li>• Technical Assistance</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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	150,000
	8) Awareness raising programme implementation	1,000,000
	9) Impact evaluation among target groups	100,000
10) Capacity building	500,000	
<b>Total</b>	<b>2,200,000</b>	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation, meeting premises, secretariat)</li> <li>• Press and media (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<ul style="list-style-type: none"> <li>• Strong Government department capable of effectively coordinating efforts.</li> <li>• Government departments with stakes or mandates, experience and technical capacity related to coastal development planning and management</li> </ul>	

<b>14. Beneficiary from the action:</b>	<ul style="list-style-type: none"> <li>• Government and non-government organisations increasing competence in addressing coastal development issues</li> <li>• Government organisations engaging in dialogues with a more qualified public and private stakeholders</li> <li>• Public at large empowered to getting more involved and participate in coastal management activities</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																					
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<b>16. Links to other actions:</b>	<p>This action is of importance to all other actions in providing:</p> <ul style="list-style-type: none"> <li>• More aware stakeholders of the issues in coastal development management</li> </ul> <p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-S04: Information Management</li> <li>• Zan-S05: Education in Primary and Secondary Schools</li> </ul> <p>Links to all actions desirable as these may be suppliers of relevant case and experience material in support of awareness raising</p>																																																																																																																																																																																																																																																																																																																																																																																																					
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Awareness raising material</li> <li>• Press material</li> <li>• Records of campaigns</li> <li>• Impact Surveys</li> <li>• Trained staff</li> <li>• ...</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																					
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## Zan-S07 Integrated Legal Review

<b>1. Background:</b>	<p>Zanzibar 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.</p> <p>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.</p>
<b>2. Title:</b>	Integrated Review of Legal Framework for Coastal Development Management
<b>3. Action Reference:</b>	Zan-S07
<b>4. Justification:</b>	<p>The working group in Stone Town found that in Zanzibar the mitigation of</p> <ul style="list-style-type: none"> <li>• 45 out of the 106 identified thematic threats to local coastal communities and ecosystems in Zanzibar corresponding to 42%, and</li> <li>• 8 out of the 36 identified district level threats to local coastal communities corresponding to 22 %,</li> </ul> <p>called for review of legal provisions. The work group further found that the mitigation of</p> <ul style="list-style-type: none"> <li>• 77 out of the 106 identified thematic threats to local coastal communities and ecosystems in Zanzibar corresponding to 73%, and</li> <li>• 33 out of the 36 identified district level threats to local coastal communities corresponding to 92 %,</li> </ul> <p>required intervention related to enforcement.</p>
<b>5. Objective:</b>	<ul style="list-style-type: none"> <li>• Harmonised legal framework for sustainable coastal management</li> <li>• Strengthened enforcement of laws and regulations</li> </ul>
<b>6. Expected outputs:</b>	<ul style="list-style-type: none"> <li>• Institutional and legal baseline</li> <li>• Reform strategy and action plan</li> <li>• Draft revision to legal integrated legal framework</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal</li> <li>b) Project mobilisation</li> </ol> <ol style="list-style-type: none"> <li>1) Establish coordination platform for action</li> <li>2) Institutional and Legal Baseline</li> <li>3) Participatory assessment</li> <li>4) Reform Strategy</li> <li>5) Action Plan</li> <li>6) Reform preparation</li> <li>7) Capacity Building</li> </ol>
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to engaging in reform processes towards more coordinated and integrated coastal zone management.
<b>9. Risks:</b>	Institutional resistance to legal reform

<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Venues and budgets for regular coordination meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to legal texts</li> </ul>																																																																																																																																																																																																																																																																																											
	Human Resources	<ul style="list-style-type: none"> <li>• Legal specialists</li> <li>• Legal and enforcement staff from relevant departments</li> <li>• Private legal sector</li> <li>• Technical assistance</li> </ul>																																																																																																																																																																																																																																																																																											
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>																																																																																																																																																																																																																																																																																											
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Total	1,250,000																																																																																																																																																																																																																																																																																												
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation, meeting premises, secretariat)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																																																												
<b>13. Responsible for the action:</b>	<ul style="list-style-type: none"> <li>• Ministry of Constitution and Legal Affairs</li> <li>• Legal officers government institution with mandates and legal instruments related to coastal development management and control</li> <li>• Private Legal Sector and Legal NGOs</li> </ul>																																																																																																																																																																																																																																																																																												
<b>14. Beneficiary from the action:</b>	Government institutions gaining access to harmonised legal framework as basis for more effective enforcement.																																																																																																																																																																																																																																																																																												
<b>15. Schedule:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Actions and Activities</th> <th colspan="3">Year 1</th> <th colspan="3">Year 2</th> <th colspan="3">Year 3</th> <th colspan="3">Year 4</th> <th colspan="3">Year 5</th> <th>Y6</th> <th>Y7</th> <th>Y8</th> <th>Y9</th> <th>Y10</th> </tr> <tr> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> </tr> </thead> <tbody> <tr> <td>Awareness Raising</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Integrated Legal Review</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>a) Project design and appraisal</td> <td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>b) Project mobilisation</td> <td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>1) Establish coordination platform for action</td> <td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>2) Institutional and Legal Baseline</td> <td></td><td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>3) Participatory assessment</td> <td></td><td></td><td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>4) Reform Strategy</td> <td></td><td></td><td></td><td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>5) Action Plan</td> <td></td><td></td><td></td><td></td><td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>6) Reform preparation</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>5) Capacity Building</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>█</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>													Actions and Activities	Year 1			Year 2			Year 3			Year 4			Year 5			Y6	Y7	Y8	Y9	Y10	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Awareness Raising																					Integrated Legal Review																					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								█													5) Capacity Building									█											
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<b>16. Links to other actions:</b>	<ul style="list-style-type: none"> <li>• Zan-S01: Integrated Coastal Zone Management Framework</li> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> </ul>																																																																																																																																																																																																																																																																																												
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Minutes of meeting in coordination platform for action</li> <li>• Proceedings from workshops and validation meetings</li> <li>• Institutional and legal baseline</li> <li>• Reform strategy and action plan</li> </ul>																																																																																																																																																																																																																																																																																												
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## Zan-L01: Rehabilitation and clean-up of five west-flowing streams in Unguja Urban and West Region

<p><b>1. Background:</b></p>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Unguja 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.</p> <p>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.</p> <p>Not much literature exists that documents nutrient and chemical pollution discharged through Zanzibar’s small rivers and streams into the coastal environment on the Zanzibar Channel, however, after rains the amount of solid wastes and sediments that discharge are visibly indicative of degraded and polluted watersheds.</p> <p>The five small stream basins, either perennial or semi-seasonal, from the northern border of the Stone Town northwards [from the 1:50,000 topographic maps] are:</p> <ul style="list-style-type: none"> <li>- Mto Mpepo, extending from Welezo area, for almost 3 km, passing Saateni Bridge before emptying at Funguni mangrove creek; the largest and most constantly flowing in the Region.</li> <li>- Mto Upepo, with sources in Masingini, runs for approximately 3 km, emptying at Mtoni Marine hotel;</li> <li>- Mto Chumbuni and Mto Mtoni that converge into a single flow, extending from source for about 3 km, passing under Mtoni Bridge (close to the Mtoni mosque) and discharging north of the fuel depot;</li> <li>- Mto Mtoni (second of same name as previous branch), but only ca. 2 km long , discharging at Mtoni Kigomeni.</li> <li>- Mto Bububu, extending inland over 4 km with several tributaries, with sources at Kidichi and Ndunduke, discharging at Bububu.</li> </ul>
<p><b>2. Title:</b></p>	<p>Rehabilitation of five west-flowing streams in Unguja Urban and West</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L01</p>
<p><b>4. Justification:</b></p>	<p>Beach pollution and marine pollution were both identified as severity level 4 threats in Unguja West and Urban Region, with sources including uncontrolled dumping and sewage seepage into river basins and the sea.</p> <p>The west flowing streams north of the Stone Town are some of the largest conduits for liquid and solid waste, chemicals and sediment to the Zanzibar 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 west coast of Zanzibar (likely affecting nearby small islands and coral reefs, and resulting in negative publicity of the historic Stone Town.</p>
<p><b>5. Objective:</b></p>	<p>By 2025 waters from these streams devoid of pollution with riverine biodiversity restored.</p>
<p><b>6. Expected outputs:</b></p>	<p>The outputs of the action to Rehabilitate five west-flowing streams in Unguja Urban and West are:</p> <ul style="list-style-type: none"> <li>• Clean and safe water in the streams.</li> </ul>

	<ul style="list-style-type: none"> <li>• Greater ability of the river banks to absorb small flooding events.</li> <li>• Reduced solid and liquid wastes discharged to sea.</li> <li>• Decreased volume of wastes into the streams.</li> <li>• Reduced wastes washed up along the coast.</li> <li>• Stream sources rehabilitated and protected.</li> <li>• Local NGOs capable of managing stream environment.</li> </ul>	
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Develop, review and implement stream management strategy.</li> <li>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).</li> <li>3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).</li> <li>4) Increase awareness among households to avoid dumping waste in streams.</li> <li>5) Investigate waste production pathways.</li> <li>6) Develop, review and implement a waste management strategy.</li> <li>7) Design appropriate stream management.</li> </ol> </li> </ol>	
<b>8. Assumptions:</b>	<p>The Government of Zanzibar 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.</p>	
<b>9. Risks:</b>	<p>Local residents and businesses may object and block the project.</p>	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Hydraulic modelling</li> <li>• Access to information</li> <li>• Green-green infrastructure</li> <li>• IWRM planning</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Civil and water engineers</li> <li>• Modellers</li> <li>• Physical Planners</li> <li>• Pollution chemists, freshwater ecologists and botanists</li> <li>• Socio-economists and resettlement specialists</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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	4,000,000
	Increase awareness among households to avoid dumping waste in streams	100,000
	Develop, review and implement a river basin waste management strategy	300,000
	Design appropriate stream management involving local partners and secure sustainability	500,000
	<b>Total</b>	<b>8,500,000</b>

	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.																																																																																																																																																																																																																																																									
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																									
<b>13. Responsible for the action:</b>	<p>Strong Local Government coastal development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• NGOs</li> <li>• etc...</li> </ul>																																																																																																																																																																																																																																																									
<b>14. Beneficiary from the action:</b>	<p>Local residents (above 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.</p> <p>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.</p>																																																																																																																																																																																																																																																									
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<b>18. Comments:</b>	

## Zan-L02: Rehabilitation and clean-up of three northwest-flowing streams in Unguja Urban and West Region

<p><b>1. Background:</b></p>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Unguja 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.</p> <p>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.</p> <p>Not much literature exists that documents nutrient and chemical pollution discharged through Zanzibar’s small rivers and streams into the coastal environment on the Zanzibar Channel, however, after rains the amount of solid wastes and sediments that discharge are visibly indicative of degraded and polluted watersheds.</p> <p>The three small streams, either perennial or semi-seasonal, in the Mahonda area [from the 1:50,000 topographic maps], and that are likely to affect the Unguja North region due to coastal current transport northwards past Mkokotoni, are:</p> <ul style="list-style-type: none"> <li>• Mto Zingwe Zingwe, extending from Mkanyageni area, past Zingwe Zingwe, then along the western border of the Mahonda sugar estate, for an overall length of almost 15 km to empty at Kiwani mangrove creek close to Bumbuwini; one of the largest and most constantly flowing in the Region and Unguja Island.</li> <li>• Mto Mwanakombo, with sources in Mgambo, that runs for approximately 6 km, feeding the marshland and rice growing areas of Chelechele, before draining into the Kiwani mangrove creek;</li> <li>• Mto Kipange, with sources in Kitunguja, extending for some 8 km, through the marshland and rice growing areas of Mwanda, before draining into the Kiwani mangrove creek.</li> </ul> <p>Not much literature exists that documents nutrient and chemical pollution discharged through these rivers into the coastal environment on the Zanzibar Channel, however, after rains the amount of solid wastes and sediments that discharge are indicative of a degraded and polluted watershed.</p>
<p><b>2. Title:</b></p>	<p>Rehabilitation of three northwest-flowing streams in Unguja Urban and West</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L02</p>
<p><b>4. Justification:</b></p>	<p>Beach pollution and marine pollution were both identified as severity level 4 threats in Unguja West and Urban Region, with sources including uncontrolled dumping and sewage seepage into river basins and the sea.</p> <p>The northwest flowing streams north of Stone Town and surrounding the large agricultural land of Mahonda are some of the largest conduits for liquid and solid waste, chemicals and sediment to the Zanzibar 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 west coast of Zanzibar (likely affecting nearby small islands and coral reefs, and the Unguja North region as well, where beach pollution was also ranked at severity level 4. Inshore ocean current are likely to transport wastes, pollution and sediments from the Kiwani mangrove swamps and Mkokotoni area northwards</p>

	to the important tourism shores of Kiwengwa and Nungwi, resulting in negative publicity of these tourist destinations.	
<b>5. Objective:</b>	By 2025 waters from these streams devoid of pollution with riverine biodiversity restored.	
<b>6. Expected outputs:</b>	<p>The outputs of the action to Rehabilitate five west-flowing streams in Unguja Urban and West are:</p> <ul style="list-style-type: none"> <li>• Clean and safe water in the streams.</li> <li>• Greater ability of the river banks to absorb small flooding events.</li> <li>• Reduced solid and liquid wastes discharged to sea.</li> <li>• Decreased volume of wastes into the streams.</li> <li>• Reduced wastes washed up along the coast.</li> <li>• Stream sources rehabilitated and protected.</li> <li>• Local NGOs capable of managing stream environment.</li> </ul>	
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Develop, review and implement stream management strategy.</li> <li>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).</li> <li>3) Rehabilitate natural sources of streams and bank vegetation (including floodplains and marshes).</li> <li>4) Increase awareness among households to avoid dumping waste in streams.</li> <li>5) Investigate waste production pathways.</li> <li>6) Develop, review and implement a waste management strategy.</li> <li>7) Design appropriate stream management.</li> </ol> </li> </ol>	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Hydraulic modelling</li> <li>• Access to information</li> <li>• Green-green infrastructure</li> <li>• IWRM planning</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Civil and water engineers</li> <li>• Modellers</li> <li>• Physical Planners</li> <li>• Pollution chemists, freshwater ecologists and botanists</li> <li>• Socio-economists and resettlement specialists</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	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

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<b>18. Comments:</b>	



## Zan-L03: Beach erosion study for Zanzibar (Pemba and Unguja)

<b>1. Background:</b>	<p>The coastal zone of Zanzibar 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.</p> <p>Many locations along the coasts, especially on Unguja Island, 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.</p> <p>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.</p> <p>Various studies have documented the changing beach levels and the loss of sand, which are particularly visibly along the beach fronts on northern Unguja and the southern parts of that island, as well as in south Pemba.</p>
<b>2. Title:</b>	Beach erosion study for Zanzibar (Pemba and Unguja)
<b>3. Action Reference:</b>	Zan-L03
<b>4. Justification:</b>	<p>Coastal erosion was ranked with severity value 5 for both Unguja North and Unguja South, value 4 for Unguja West and Urban, 3 for Pemba South and 1 for Pemba North. Furthermore, a threat associated with the entire tourism sector due to unchecked sand mining was ranked at severity level 4; and under non-extractive resource uses, that include sand mining, also included a threat due to lack of understanding of the causative factors resulting in beach erosion, ranked at severity level 4.</p> <p>With the potential sea level rise for the coastline, if left unattended, the erosion problem affecting Zanzibar 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.</p>
<b>5. Objective:</b>	By 2025, shoreline development planning and control adequately take erosion and accretion processes into account.
<b>6. Expected outputs:</b>	<p>The outputs of the action to study beach erosion on Unguja and Pemba islands are:</p> <ul style="list-style-type: none"> <li>• Understand the oceanographic and meteorological influences on the coastlines of the two islands (to better understand beach erosion and means to address the problem)</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Study erosion/accretion processes along the coast and monitor and map changes.</li> <li>2) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing the shoreline.</li> <li>3) Re-habilitate and mitigate natural erosion soft barriers (mangroves, shoreline vegetation...).</li> <li>4) Develop and review beach management strategy.</li> <li>5) Enforce illegal beach sand extraction</li> </ol>

	6) Guide the construction of physical mitigation measures																			
<b>8. Assumptions:</b>	The Government of Zanzibar 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.																			
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.																			
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Modelling</li> <li>• Satellite images</li> <li>• Marine instruments</li> <li>• Field surveys</li> </ul>																		
	Human Resources	<ul style="list-style-type: none"> <li>• Oceanographers</li> <li>• Civil and water engineers,</li> <li>• Local planners</li> <li>• Socio-economists,</li> <li>• Resettlement specialists, ...</li> <li>• ...</li> </ul>																		
<b>11. Budget estimate:</b>	<table border="1"> <thead> <tr> <th>Item</th> <th>Estimate in USD</th> </tr> </thead> <tbody> <tr> <td>Project preparation and mobilisation</td> <td>100,000</td> </tr> <tr> <td>Enforce relevant legislative/regulatory instruments</td> <td>100,000</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>2,000,000</td> </tr> <tr> <td>Define and quantify costs for physical interventions</td> <td>1,000,000</td> </tr> <tr> <td>Develop and review beach management strategy</td> <td>500,000</td> </tr> <tr> <td><b>Total</b></td> <td><b>4,400,000</b></td> </tr> </tbody> </table> <p>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.</p>		Item	Estimate in USD	Project preparation and mobilisation	100,000	Enforce relevant legislative/regulatory instruments	100,000	Study erosion/accretion processes along the coast and monitor and map changes, local capacity building	1,500,000	Review, develop, implement and enforce relevant legislative/regulatory instruments addressing the shoreline	200,000	Re-habilitate natural erosion soft barriers (mangroves, shoreline vegetation...)	2,000,000	Define and quantify costs for physical interventions	1,000,000	Develop and review beach management strategy	500,000	<b>Total</b>	<b>4,400,000</b>
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<b>Total</b>	<b>4,400,000</b>																			
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																			
<b>13. Responsible for the action:</b>	Strong Local Government department (e.g. DoE) capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• NGOs</li> <li>• etc...</li> </ul>																			
<b>14. Beneficiary from the action:</b>	<p>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.</p> <p>Indirect or long term beneficiaries will be the coastal population at large and coastal developers, through improved coastal land stability which will better</p>																			

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<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Beach erosion loss from unsustainable land use reduced</li> <li>• Beach sand mining reduced</li> <li>• Local polices and guidelines for shoreline land use</li> </ul>																																																																																																																																																																																																																			
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## Zan-L04: Sewage collection and treatment facilities for the Stone Town, Unguja Urban and West Region

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Unguja 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.</p> <p>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.</p> <p>A body of literature documents high nutrient and faecal coliform bacteria levels in waters off the Stone Town, discharged through Zanzibar’s small rivers and streams and the sewerage system with only primary screening, directly into the coastal environment on the Zanzibar Channel.</p>
<b>2. Title:</b>	Sewage collection and treatment facilities for Stone Town, Unguja West and Urban
<b>3. Action Reference:</b>	Zan-L04
<b>4. Justification:</b>	Beach pollution and marine pollution were identified as severity level 4 threats in Unguja West and Urban Region. Sewage from over 7,000 households in Stone Town (half a million 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 (likely affecting nearby small islands and coral reefs, and resulting in negative publicity to the city. Further, inadequate urban sanitation, also causing health problems from contaminated ground and surface water as well as from water-borne diseases, was ranked at severity level 4.
<b>5. Objective:</b>	By 2025 at least 80% of Stone Town households connected to sewage collection and treatment system.
<b>6. Expected outputs:</b>	<p>The outputs of the action to upgrade the sewage system of the Stone Town in Unguja Urban and West are:</p> <ul style="list-style-type: none"> <li>• Fully operational sewage treatment plants where appropriate.</li> <li>• Effective and sustainable sewage collection systems in place.</li> <li>• Clean and safe water in coastal waters.</li> <li>• Reduced sewage wastes discharged to sea.</li> <li>• Reduced wastes and pathogens washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering,</li> <li>2) Project management (includes construction management)</li> <li>3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Sewage collection system</li> <li>5) Site preparation: Demolishing, ground work, rerouting pipes &amp; cables, roads</li> <li>6) Construction: civil, mechanical, etc., Contingency.</li> <li>7) Supplies, personnel (hiring and training/capacity building)</li> </ol> </li> </ol>
<b>8. Assumptions:</b>	The Government of Zanzibar 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.
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.

<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>																				
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• Spatial planners</li> <li>• ...</li> </ul>																				
<b>11. Budget estimate:</b>	<table border="1"> <thead> <tr> <th>Item</th> <th>Estimate in USD</th> </tr> </thead> <tbody> <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 &amp; 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> </tbody> </table>		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.	-	Connecting existing 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	Total	24,300,000
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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.																						
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																					
<b>13. Responsible for the action:</b>	<p>Strong Government infrastructure development stakeholder capable of effectively coordinating efforts.</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>																					
<b>14. Beneficiary from the action:</b>	<p>Local residents (above 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 sewage pollution entering the inshore coastal waters.</p> <p>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.</p>																					

<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
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<b>16. Links to other actions:</b>	<p>Links to following systemic actions would be desirable:</p> <ul style="list-style-type: none"> <li>• Zan-S01: Integrated Coastal Zone Management</li> <li>• Zan-S02: Spatial Planning</li> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> <li>• Zan-S07: Integrated Legal Review</li> </ul> <p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L01: Rehabilitation of three north-flowing streams in Unguja Urban and West</li> <li>• Zan-L06: Sewage collection and treatment facilities for Nungwi Village and hotel areas</li> <li>• Zan-L05: Sewage collection and treatment facilities for Zanzibar Town periphery</li> <li>• Zan-L13: Unguja West and Urban solid waste collection and processing development</li> </ul>																									
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (chemistry, BOD, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• Households connected to sewerage system</li> </ul>																									
<b>18. Comments:</b>																										

## Zan-L05: Sewage collection and treatment facilities for Zanzibar Town periphery neighbourhoods, Unguja Urban and West

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Unguja has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>A body of literature documents high nutrient and faecal coliform bacteria levels in waters off the Stone Town, discharged through Zanzibar’s small rivers and streams and the sewerage system with only primary screening, directly into the coastal environment on the Zanzibar Channel.</p> <p>The periphery urban area of Zanzibar Town includes a large neighbourhood called N’gambo, plus numerous others that together cover an area of 6-7 square kilometres, all without a formal sewage system.</p>
<b>2. Title:</b>	Sewage collection and treatment facilities for Zanzibar Town periphery neighbourhoods, Unguja Urban and West
<b>3. Action Reference:</b>	Zan-L05
<b>4. Justification:</b>	<p>The urban problems associated with the periphery of the Zanzibar Stone Town are well-documented, particularly under the SMOLE programme. Inadequate sanitation, causing health problems from contaminated water as well as from water-borne diseases, was ranked at severity level 4. In addition, coastal areas close to the periphery urban neighbourhoods are likely to be suffering from leaching of nutrients from septic tanks and soak-aways as well as raw sewage pollution from storm drain that act as conduits of sewage directly into the marine environment. Beach pollution and marine pollution were identified as severity level 4 threats in Unguja Urban and West.</p>
<b>5. Objective:</b>	By 2025 at least 80% of Zanzibar Town periphery households are connected to sewage collection and treatment system.
<b>6. Expected outputs:</b>	<p>The outputs of the Action to install a sewage system for Zanzibar Town periphery households are:</p> <ul style="list-style-type: none"> <li>• Fully operational sewage treatment plants where appropriate.</li> <li>• Effective and sustainable sewage collection systems in place.</li> <li>• Clean and safe water in coastal waters.</li> <li>• Reduced sewage wastes discharged to sea.</li> <li>• Reduced wastes and pathogens washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering,</li> <li>2) Project management (includes construction management)</li> <li>3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Sewage collection system</li> <li>5) Site preparation: Demolishing, ground work, rerouting pipes &amp; cables, roads</li> <li>6) Construction: civil, mechanical, etc., Contingency.</li> </ol> </li> </ol>

	7) Supplies, personnel (hiring and training/ capacity building)	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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
	<b>Total</b>	<b>34,300,000</b>
	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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (several 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.</p> <p>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.</p>	



<b>15. Schedule:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Actions and Activities</th> <th colspan="4">Year 1</th> <th colspan="4">Year 2</th> <th colspan="4">Year 3</th> <th colspan="4">Year 4</th> <th colspan="4">Year 5</th> <th>Y6</th> <th>Y7</th> <th>Y8</th> <th>Y9</th> <th>Y10</th> </tr> <tr> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th> <th></th><th></th><th></th><th></th><th></th> </tr> </thead> <tbody> <tr> <td><b>Sewage facilities for Zanzibar Town periphery</b></td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Project preparation and mobilisation</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Initial studies, design and engineering,</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Project management (includes construction management)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Sewage collection system</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Site preparation: Demolishing, ground work, rerouting pipes &amp; cables, roads</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Construction: civil, mechanical, etc., Contingency.</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Supplies, personnel (hiring and training/capacity building)</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </tbody> </table>	Actions and Activities	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						<b>Sewage facilities for Zanzibar Town periphery</b>																										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)																									
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## Zan-L06: Sewage collection and treatment facilities for Nungwi Village and hotel areas, Unguja North Region

<p><b>1. Background:</b></p>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Unguja has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature exists on nutrient and faecal coliform bacteria levels in waters around the northern end of Unguja, yet villagers and hotel use sewage soak-aways, with nutrients directly entering into the coastal environment and in some cases faeces from villagers who defecate on the beaches through lack of alternatives.</p>
<p><b>2. Title:</b></p>	<p>Sewage collection and treatment facilities for Nungwi village and adjacent hotel areas, Unguja North</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L06</p>
<p><b>4. Justification:</b></p>	<p>Beach pollution was identified as severity level 4 threats in Unguja North, notably at Nungwi village area. Similarly, inadequate sewage infrastructure and waste management resulting in pollution was ranked as a major problem, level 5, affecting the entire industry on Zanzibar. There are no sewage treatment systems in the Nungwi area and sewage pollution to the marine environment is continuous – whether nutrients only, or with faecal material. Inadequate sanitation, causing health problems from contaminated water as well as from water-borne diseases, was ranked at severity level 4, causing beach and sea pollution which affects health (e.g. of fishermen, bathers, tourists). Marine life (e.g. fish and habitats), extending many kilometres around the northern portion of Unguja, is also likely affected by Nungwi nutrients and sewage pollution, as are nearby small islands and coral reefs, resulting in negative publicity of the tourist destination.</p>
<p><b>5. Objective:</b></p>	<p>By 2025 at least 80% of Nungwi households and hotels connected to sewage collection and treatment system.</p>
<p><b>6. Expected outputs:</b></p>	<p>The outputs of the action to install a sewage system of Nungwi Village and hotel areas in Unguja North are:</p> <ul style="list-style-type: none"> <li>• Fully operational sewage treatment plants where appropriate.</li> <li>• Effective and sustainable sewage collection systems in place.</li> <li>• Clean and safe water in coastal waters.</li> <li>• Reduced sewage wastes discharged to sea.</li> <li>• Reduced wastes and pathogens washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<p><b>7. Activities:</b></p>	<p>a) Project design and appraisal.  b) Project tendering</p> <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering,</li> <li>2) Project management (includes construction management)</li> <li>3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Sewage collection system</li> <li>5) Site preparation: Demolishing, ground work, rerouting pipes &amp; cables, roads</li> <li>6) Construction: civil, mechanical, etc, Contingency.</li> <li>7) Supplies, personnel (hiring and training/capacity building)</li> </ol>
<p><b>8. Assumptions:</b></p>	<p>The Government of Zanzibar 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.</p>

<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ..</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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.	13,000,000
	Supplies, personnel (hiring and training/capacity building)	2,000,000
	<b>Total</b>	<b>34,300,000</b>
	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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<p>Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>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.</p> <p>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.</p>	

**15. Schedule:**

Actions and Activities	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4								
<b>Sewage facilities for Nungwi and hotels</b>																												
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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:

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

Of particular relevance and importance would be links to:

- Zan-L01: Rehabilitation of three north-flowing streams in Unguja Urban and West
- Zan-L13: Unguja West and Urban solid waste collection and processing development project
- Zan-L04: Sewage collection and treatment facilities for Stone Town
- Zan-L05: Sewage collection and treatment facilities for Zanzibar Town periphery

**17. Performance indicators:**

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

**18. Comments:**

## Zan-L07: Sewage collection and treatment facilities for the Mkoani, Pemba South Region

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature exists on nutrient and faecal coliform bacteria levels in waters around the western and southern shores of Pemba, yet with Mkoani town inhabitants using sewage soak-aways /or defecating on the beaches, nutrients and/or bacteria are directly entering the coastal environment.</p>
<b>2. Title:</b>	Sewage collection and treatment facilities for Mkoani town, Pemba North
<b>3. Action Reference:</b>	Zan-L07
<b>4. Justification:</b>	<p>Marine pollution were identified as severity level 4 in Pemba South Region, especially at Mkoani and Chake Chake areas. Untreated sewage-related disease from several thousand households in Mkoani do not have sewage treatment systems and sewage pollution to the marine environment is continuous. Inadequate sanitation, causing health problems from contaminated water as well as from water-borne diseases, was ranked at severity level 3, affecting health of fishermen, bathers, tourists and urban residents. Marine life (e.g. fish and habitats) are similarly affected from resulting seepage and marine pollution, and a negative publicity to the city if portrayed to visitors and tourists.</p> <p>The projected population and development growth (also associated with the port) in the coming years will further aggravate the pollution and health problems associated with the lack of a municipal sewage system at Mkoani.</p>
<b>5. Objective:</b>	By 2025 at least 80% of Mkoani households connected to sewage collection and treatment system.
<b>6. Expected outputs:</b>	<p>The outputs of the action to install a sewage system at Mkoani in Pemba South are:</p> <ul style="list-style-type: none"> <li>• Fully operational sewage treatment plants where appropriate.</li> <li>• Effective and sustainable sewage collection systems in place.</li> <li>• Clean and safe water in coastal waters.</li> <li>• Reduced sewage wastes discharged to sea.</li> <li>• Reduced wastes and pathogens washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering,</li> <li>2) Project management (includes construction management)</li> <li>3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Sewage Collection System</li> <li>5) Site preparation: Demolishing, ground work, rerouting pipes &amp; cables, roads</li> <li>6) Construction: civil, mechanical, etc., Contingency.</li> <li>7) Supplies, personnel (hiring and training/capacity building)</li> </ol> </li> </ol>

<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ..</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	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.	-
	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
	Total	34,300,000
		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.
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<p>Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (several tens of thousands) 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.</p> <p>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.</p>	

<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
	<b>Sewage facilities for Mkoani town</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>					
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	Construction: civil, mechanical, etc., Contingency.																									
	Supplies, personnel (hiring and training/capacity building)																									
<b>16. Links to other actions:</b>	<p>Links to following systemic actions would be desirable:</p> <ul style="list-style-type: none"> <li>• Zan-S01: Integrated Coastal Zone Management</li> <li>• Zan-S02: Spatial Planning</li> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> <li>• Zan-S07: Integrated Legal Review</li> </ul> <p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L08: Sewage collection and treatment facilities for Chake Chake</li> <li>• Zan-L10: Regional solid waste collection and processing facility, Pemba North</li> <li>• Zan-L11: Regional solid waste collection and processing facility, Pemba South</li> </ul>																									
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (chemistry, BOD, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• ..</li> </ul>																									
<b>18. Comments:</b>																										

## Zan-L08: Sewage collection and treatment facilities for the Chake Chake, Pemba South Region

<p><b>1. Background:</b></p>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature exists on nutrient and faecal coliform bacteria levels in waters around the western and southern shores of Pemba, yet with Chake Chake town inhabitants using sewage soak-aways or defecating on the beaches, nutrients and/or bacteria are directly entering the coastal environment.</p>
<p><b>2. Title:</b></p>	<p>Sewage collection and treatment facilities for Chake Chake town, Pemba South</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L08</p>
<p><b>4. Justification:</b></p>	<p>Marine pollution were identified as severity level 4 in Pemba South Region, especially at Mkoani and Chake Chake areas. Untreated sewage-related disease from several thousand households in Chake Chake do not have sewage treatment systems and sewage pollution to the marine environment is continuous. Inadequate sanitation, causing health problems from contaminated water as well as from water-borne diseases, was ranked at severity level 3, affecting health of fishermen, bathers, tourists and urban residents. Marine life (e.g. fish and habitats) are similarly affected from resulting seepage and marine pollution, and a negative publicity to the city if portrayed to visitors and tourists.</p> <p>The projected population and development growth (also associated with the port) in the coming years will further aggravate the pollution and health problems associated with the lack of a municipal sewage system at Chake Chake.</p>
<p><b>5. Objective:</b></p>	<p>By 2025 at least 80% of Chake Chake households connected to sewage collection and treatment system.</p>
<p><b>6. Expected outputs:</b></p>	<p>The outputs of the action to install a sewage system at Chake Chake in Pemba South are:</p> <ul style="list-style-type: none"> <li>• Fully operational sewage treatment plants where appropriate.</li> <li>• Effective and sustainable sewage collection systems in place.</li> <li>• Clean and safe water in coastal waters.</li> <li>• Reduced sewage wastes discharged to sea.</li> <li>• Reduced wastes and pathogens washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<p><b>7. Activities:</b></p>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering             <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering,</li> <li>2) Project management (includes construction management)</li> <li>3) Site acquisition: Acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Infrastructure: Access roads, sewer lines and effluent discharge pipelines, power supply;</li> <li>5) Site preparation: Demolishing, ground work, rerouting pipes &amp; cables, roads</li> </ol> </li> </ol>



	6) Construction: civil, mechanical, etc., Contingency. 7) Supplies, personnel (hiring and training/capacity building)	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ..</li> <li>• ..</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	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.	-
	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
	Total	34,300,000
	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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (several tens of thousands) 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.</p> <p>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.</p>	

**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
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Supplies, personnel (hiring and training/capacity building)																				

**16. Links to other actions:**

Links to following systemic actions would be desirable:

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

Of particular relevance and importance would be links to:

- Zan-L07: Sewage collection and treatment facilities for Mkoani, Pemba South
- Zan-L10: Regional solid waste collection and processing facility, Pemba North
- Zan-L11: Regional solid waste collection and processing facility, Pemba South

**17. Performance indicators:**

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

**18. Comments:**

## Zan-L09: Professional Tourism Training Centre for Zanzibar

<b>1. Background:</b>	<p>The tourism industry is now the most important sector for the economy of Zanzibar, contributing over 47% of GDP and about 80% of all foreign investment. It contributes within all five regions, but more so in the three regions of Unguja. Despite the positive contributions made by the sector, a number of threats are identified which affect local communities and in some cases the environment.</p> <p>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.</p> <p>The most significant threat affecting local livelihoods associated with the tourism sector is the loss of employment opportunities due to inadequate levels of training among local job-seekers and competition for those job opportunities from more qualified personnel from mainland Tanzania and Kenya. Though exact figures were not found, as to the numbers of staff that are not from Zanzibar, the general perception among those in the industry is that more locals could and should be employed but only if they were better qualified.</p>
<b>2. Title:</b>	Professional Tourism Training Centre (PTTC) for Zanzibar
<b>3. Action Reference:</b>	Zan-L09
<b>4. Justification:</b>	<p>Loss of employment opportunities was ranked at severity level 3. However, given the expansion of the sector at 10% per annum, and the population growth of the island at around 3%, the potential for local business and staff employed in foreign hotels will continue to increase, yet it is estimated that only 20% of the earning from the sector benefits the local population, including the purchase of local food stuffs. Consequently, unless the local population are able to participate more in the tourism sector, the significance of the lost employment/business opportunities will similarly increase. Better educated candidates for employment as well as to start and run their own tourism businesses will contribute to a greater share of the tourism profits reaching Zanzibar people.</p> <p>Furthermore, social problem associated with unemployment, such as crime and vice are threats that rank at severity level 4, and desperation among communities leading to deterioration of the marine environment through destructive fishing practices and of the terrestrial conservation areas through encroachment, especially of forest, were both threats ranked at level 4. By involving more local youths in the tourism sector, through better and dedicated training in a facility run by professions in the sector, tourism-related job opportunities will become more realistic.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the tourism sector jobs, in all categories, held by local Zanzibaris.
<b>6. Expected outputs:</b>	<p>The outputs of the action to establish a professional tourism training facility in Zanzibar are:</p> <ul style="list-style-type: none"> <li>• Fully operational tourism training facility.</li> <li>• Effective and sustainable professional training</li> <li>• Reduced loss of jobs in the sector to non-Zanzibaris</li> <li>• Improved share of the higher positions in the sector by Zanzibaris.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Identify a suitable location/premises for the PTTC</li> <li>2) Design the needs of the facility</li> </ol> </li> </ol>

	3) Conduct a detailed needs assessment of the tourism sector, covering tour operators, agents, guides, hotel staff at all levels and investment 4) Develop the appropriate courses and costings 5) Equip the PTTC with staff and equipment 6) Conduct a sustainability study to secure long-term funding, with participation of the tax authorities and the private sector 7) Conduct the first two years of training 8) Review the programme and make necessary adjustment																					
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the development of the local capacity in the tourism sector. Local residents and businesses are supportive of initiatives to improve the capacity within and share of the tourism business.																					
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.																					
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• ..</li> <li>• ..</li> </ul>																				
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil engineers</li> <li>• Tourism consultants</li> <li>• Tourism trainers</li> <li>• Administrators</li> <li>•</li> </ul>																				
<b>11. Budget estimate:</b>	<table border="1"> <thead> <tr> <th>Item</th> <th>Estimate in USD</th> </tr> </thead> <tbody> <tr> <td>Project preparation and mobilisation</td> <td>100,000</td> </tr> <tr> <td>Initial studies, design and engineering for the PTTC facility</td> <td>400,000</td> </tr> <tr> <td>Needs assessment in tourism industry</td> <td>100,000</td> </tr> <tr> <td>Course design</td> <td>100,000</td> </tr> <tr> <td>Project management (includes construction management)</td> <td>500,000</td> </tr> <tr> <td>Equipment: vehicles, office and kitchen equipment;</td> <td>1,000,000</td> </tr> <tr> <td>Construction of new or modification of existing building</td> <td>2,000,000</td> </tr> <tr> <td>Recruitment and salaries of staff and personnel (all levels) for three years, and training of trainers.</td> <td>2,000,000</td> </tr> <tr> <td>Total</td> <td>6,200,000</td> </tr> </tbody> </table>		Item	Estimate in USD	Project preparation and mobilisation	100,000	Initial studies, design and engineering for the PTTC facility	400,000	Needs assessment in tourism industry	100,000	Course design	100,000	Project management (includes construction management)	500,000	Equipment: vehicles, office and kitchen equipment;	1,000,000	Construction of new or modification of existing building	2,000,000	Recruitment and salaries of staff and personnel (all levels) for three years, and training of trainers.	2,000,000	Total	6,200,000
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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. The budget covers the first three years of operations only – thereafter the facility should be self-funding.																						
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> <li>• Tourism private sector on Zanzibar</li> </ul>																					
<b>13. Responsible for the action:</b>	Strong Government development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> <li>• ...</li> </ul>																					

<b>14. Beneficiary from the action:</b>	<p>Local residents (several thousand) with improved senior-level educations from participating in the courses offered at the PTTC, with greater prospects of participating more fully in the tourism sector.</p> <p>Hotels and hoteliers getting access to well qualified staff</p> <p>Indirect or long term beneficiaries will be the coastal populations at large that through improved livelihoods associated with the tourism sector and from lessened needs to engage in destructive natural resource uses or anti-social activities, thus bettering their opportunities for socio-economic development without compromising sustainable natural resources and environmental management.</p>																																																																																																																																																																																																																																																																																																																																																																													
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## Zan-L10: Regional Solid Waste Collection and Processing facility for Pemba North

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature documents the amounts of solid wastes that enter coastal waters around the north and western shores of Pemba, yet with Wete and Micheweni 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.</p>
<b>2. Title:</b>	Regional solid waste collection and processing facility, Pemba North
<b>3. Action Reference:</b>	Zan-L10
<b>4. Justification:</b>	<p>Marine pollution were identified as severity level 2 in Pemba North Region, especially at Wete and Micheweni areas. The several thousand households in Wete and Micheweni lack access to solid waste treatment systems and pollution to the marine environment is continuous. Inadequate waste control also contributes health problems from contaminated water as well as from water-borne diseases, ranked severity level 2 for Pemba North, affecting health of fishermen, bathers, tourists and urban residents. Beach pollution was ranked severity level 1, though with projected population and development growth (associated with Wete and Mcheweni and the village areas) in the coming years, all forms of pollution (and health problems) associated with the lack of an effective municipal collection and solid waste system at Pemba North are bound to deteriorate further.</p> <p>Marine life (e.g. fish and habitats) are similarly affected from resulting pollution - with fisheries decline ranked severity level 4 in Pemba North. The negative publicity aspect of visible solid waste affects visitors and tourists.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the households linked to a solid waste collection and processing facility.
<b>6. Expected outputs:</b>	<p>The outputs of the action to install a solid waste collection and processing facility in Pemba North are:</p> <ul style="list-style-type: none"> <li>• Fully operational solid waste collection and processing plant.</li> <li>• Effective and sustainable solid collection systems in place.</li> <li>• Reduced solid wastes discharged to sea and washed up along the coast.</li> <li>• Local LGA capable of managing solid waste system.</li> </ul>
<b>7. Activities:</b>	<p>a) Project design and appraisal.</p> <p>b) Project tendering</p> <ol style="list-style-type: none"> <li>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 Pemba North</li> <li>2) Project management (includes construction management)</li> <li>3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Infrastructure: Access roads, power supply</li> <li>5) Equipment: vehicles, compactors, incinerators, re-cycling</li> </ol>

	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)	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• Socio-economists, re-settlement specialists..</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	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.	

<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
		<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>					
	<b>Solid waste collection/processing Pemba N</b>																									
	Project preparation and mobilisation																									
	Mobilisation/review of solid waste generation and design of specific needs																									
	Project management																									
	Waste processing site acquisition:																									
	Infrastructure																									
	Equipment																									
	Site preparation: ground work, roads																									
	Construction: civil, mechanical, Supplies, personnel (hiring and training/capacity building)																									
	<b>16. Links to other actions:</b>	<p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L07: Sewage collection and treatment facilities for Mkoani, Pemba South</li> <li>• Zan-L08: Regional solid waste collection and processing Chake Chake, Pemba South</li> <li>• Zan-L11: Regional solid waste collection and processing facility, Pemba South</li> </ul>																								
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (solid wastes, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• ...</li> </ul>																									
<b>18. Comments:</b>																										



## Zan-L11: Regional Solid Waste Collection and Processing facility for Pemba South

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature documents the amounts of solid wastes that enter coastal waters around the north and western shores of Pemba, yet with Chake Chake and Mkoani 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.</p>
<b>2. Title:</b>	Regional solid waste collection and processing facility, Pemba South
<b>3. Action Reference:</b>	Zan-L11
<b>4. Justification:</b>	<p>Marine pollution were identified as severity level 4 in Pemba South Region, especially at Weshu, Chake Chake and Mkoani areas. The several thousand households in these three urban centres lack access to solid waste treatment systems and pollution to the marine environment is continuous. Inadequate waste control also contributes health problems from contaminated water as well as from water-borne diseases, ranked severity level 3 for Pemba South, affecting health of fishermen, bathers, tourists and urban residents. Beach pollution was ranked severity level 3, though with projected population and development growth (associated with the three urban areas and the village areas) in the coming years, all forms of pollution (and health problems) associated with the lack of an effective municipal collection and solid waste system at Pemba South are bound to deteriorate further.</p> <p>Marine life (e.g. fish and habitats) are similarly affected from resulting pollution - with fisheries decline ranked severity level 4 in Pemba South. The negative publicity aspect of visible solid waste affects visitors and tourists.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the households connected to solid waste collection and processing facility
<b>6. Expected outputs:</b>	<p>The outputs of the action to install a solid waste collection and processing facility in Pemba South are:</p> <ul style="list-style-type: none"> <li>• Fully operational solid waste collection and processing plant.</li> <li>• Effective and sustainable solid collection systems in place.</li> <li>• Reduced solid wastes discharged to sea and washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>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 Pemba South</li> <li>2) Project management (includes construction management)</li> <li>3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</li> <li>4) Infrastructure: Access roads, power supply.</li> <li>5) Equipment: vehicles, compactors, incinerators, re-cycling.</li> <li>6) Site preparation: ground work, cables, roads</li> </ol> </li> </ol>

	7) Construction: civil, mechanical, contingency. 8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• Socio-economists, re-settlement specialists..</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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, cables, 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.
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<p>Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (several tens of thousand) 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.</p> <p>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.</p>	

<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
		<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>					
	<b>Solid waste collection/processing Pemba S</b>																									
	Project preparation and mobilisation																									
	Mobilisation/review of solid waste generation and design of specific needs																									
	Project management																									
	Waste processing site acquisition:																									
	Infrastructure																									
	Equipment																									
	Site preparation: ground work, roads																									
Construction: civil, mechanical, contingency.																										
Supplies, personnel (hiring and																										
<b>16. Links to other actions:</b>	<p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L07: Sewage collection and treatment facilities for Mkoani, Pemba South</li> <li>• Zan-L08: Sewage collection and treatment facilities for Chake Chake, Pemba South</li> <li>• Zan-L10: Regional solid waste collection and processing facility, Pemba North</li> </ul>																									
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (solid wastes, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• ...</li> </ul>																									
<b>18. Comments:</b>																										

## Zan-L12: Regional Solid Waste Collection and Processing facility for Unguja North

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature documents the amounts of solid wastes that enter coastal waters around the north and western shores of Unguja North, yet within large villages like Nungwi, Mkokotoni and northeast centres like Pwani Mchangani and Kiwengwa (among others) the inhabitants are 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 coastal productivity, fishing activities and tourism potential.</p>
<b>2. Title:</b>	Regional solid waste collection and processing facility, Unguja North
<b>3. Action Reference:</b>	Zan-L12
<b>4. Justification:</b>	<p>Beach pollution was ranked at severity level 4 for the main northern villages in Unguja North Region; while marine pollution were identified as severity level 2, especially at Pwani Mchangani and Kiwengwa, Matemwe, Nungwi, Mkokotoni and Mangapwani areas. The several tens of thousands of households in these large village centres lack access to solid waste treatment systems and pollution to the marine environment is continuous. Inadequate solid waste control also contributes health problems from contaminated water as well as from water-borne diseases, ranked severity level 2 for Unguja North, affecting health of fishermen, bathers, tourists and urban residents. With projected population and development growth (associated with these large villages and their associated hotels) in the coming years, all forms of pollution (and health problems) associated with the lack of an effective municipal collection and solid waste system at Unguja North are bound to deteriorate further.</p> <p>Marine life (e.g. fish and habitats) are similarly affected from resulting pollution - with fisheries decline ranked severity level 4 in Unguja North. The negative publicity aspect of visible solid waste affects visitors and tourists.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the households connected to solid waste collection and processing facility
<b>6. Expected outputs:</b>	<p>The outputs of the action to install a solid waste collection and processing facility in Unguja North are:</p> <ul style="list-style-type: none"> <li>• Fully operational solid waste collection and processing plant.</li> <li>• Effective and sustainable solid collection systems in place.</li> <li>• Reduced solid wastes discharged to sea and washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>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 Unguja North</li> <li>2) Project management (includes construction management)</li> </ol> </li> </ol>

	<p>3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</p> <p>4) Infrastructure: Access roads, power supply..</p> <p>5) Equipment: vehicles, compactors, incinerators, re-cycling..</p> <p>6) Site preparation: ground work, cables, roads</p> <p>7) Construction: civil, mechanical, contingency.</p> <p>8) Supplies, personnel (hiring and training/ capacity building in solid waste handling, sorting and treatment)</p>	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• Socio-economists, re-settlement specialists..</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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, cables, 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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<p>Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (tens of thousands, and tourism stakeholders) 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.</p> <p>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.</p>	

<b>15. Schedule:</b>		Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10			
	<b>Actions and Activities</b>	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4								
	<b>Solid waste collection/processing</b>																												
	<b>Unguja North</b>																												
	Project preparation and mobilisation	■																											
	Mobilisation/review of solid waste generation and design of specific needs			■																									
	Project management					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
	Waste processing site acquisition:																												
	Infrastructure						■	■	■																				
	Equipment																												
	Site preparation: ground work, roads										■	■	■																
	Construction: civil, mechanical, contingency.														■	■	■												
	Supplies, personnel (hiring and training/capacity building)																												
	<b>16. Links to other actions:</b>	<p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L06: Sewage collection and treatment facilities for Nungwi and hotel areas</li> <li>• Z13: Regional solid waste collection and processing facility, Unguja West and Urban</li> <li>• Zan-L14: Regional solid waste collection and processing facility, Unguja South</li> </ul>																											
	<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (solid wastes, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• ...</li> </ul>																											
<b>18. Comments:</b>																													

## Zan-L13: Regional Solid Waste Collection and Processing facility for Unguja Urban and West

<p><b>1. Background:</b></p>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature documents the amounts of solid wastes that enter coastal waters around the north and western shores of Unguja North, yet within large villages like Nungwi, Mkokotoni and northeast centres like Pwani Mchangani and Kiwengwa (among others) the inhabitants are 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 coastal productivity, fishing activities and tourism potential.</p>
<p><b>2. Title:</b></p>	<p>Regional solid waste collection and processing facility, Unguja West and Urban</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L13</p>
<p><b>4. Justification:</b></p>	<p>Beach pollution was ranked at severity level 4 for the main northern villages in Unguja West and Urban Region, with marine pollution also identified as severity level 4. The several hundreds of thousands of households in the Stone Town area lack access to solid waste treatment systems and pollution to the marine environment is continuous. Inadequate solid waste control also contributes health problems from contaminated water as well as from water-borne diseases, ranked severity level 2 for Unguja Urban and West, affecting health of fishermen, bathers, tourists and urban residents. With projected population and development growth (associated with the Stone Town and their associated hotels) in the coming years, all forms of pollution (and health problems) associated with the lack of an effective municipal collection and solid waste system at Unguja Urban and West are bound to deteriorate further.</p> <p>Marine life (e.g. fish and habitats) are similarly affected from resulting pollution - with fisheries decline ranked severity level 4 in Unguja Urban and West. The negative publicity aspect of visible solid waste affects visitors and tourists.</p>
<p><b>5. Objective:</b></p>	<p>By 2025 at least 80% of the households connected to solid waste collection and processing facility</p>
<p><b>6. Expected outputs:</b></p>	<p>The outputs of the action to install a solid waste collection and processing facility in Unguja Urban and West are:</p> <ul style="list-style-type: none"> <li>• Fully operational solid waste collection and processing plant.</li> <li>• Effective and sustainable solid collection systems in place.</li> <li>• Reduced solid wastes discharged to sea and washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<p><b>7. Activities:</b></p>	<p>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 Unguja Urban and West  2) Project management (includes construction management)</p>

	<p>3) Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.</p> <p>4) Infrastructure: Access roads, power supply..</p> <p>5) Equipment: vehicles, compactors, incinerators, re-cycling..</p> <p>6) Site preparation: ground work, cables, roads</p> <p>7) Construction: civil, mechanical, contingency.</p> <p>8) Supplies, personnel (hiring and training/capacity building in solid waste handling, sorting and treatment)</p>	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• Socio-economists, re-settlement specialists..</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	Project preparation and mobilisation	100,000
	Initial studies, design and engineering,	300,000
	Project management (includes construction management)	700,000
	Waste processing site acquisition: acquisition of building plot, brokers, notaries, taxes.	-
	Infrastructure: Access roads, power supply..	1,500,000
	Equipment: vehicles, compactors, incinerators, re-cycling..	3,000,000
	Site preparation: ground work, cables, roads	3,000,000
	Construction: civil, mechanical, contingency.	2,000,000
	Supplies, personnel	1,500,000
	Total	12,100,000
		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.
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<p>Strong Government infrastructure development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (hundreds of thousand, plus tourists) 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.</p> <p>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.</p>	



<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
		<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>					
	<b>Solid waste collection/processing Unguja West and Urban</b>																									
	Project preparation and mobilisation	■																								
	Mobilisation/review of solid waste generation and design of specific needs		■																							
	Project management					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
	Waste processing site acquisition:					■	■	■	■																	
	Infrastructure					■	■	■	■																	
	Equipment									■	■	■	■													
	Site preparation: ground work, roads					■	■	■	■	■	■	■	■													
	Construction: civil, mechanical, contingency.									■	■	■	■													
	Supplies, personnel (hiring and training/capacity building)									■	■	■	■	■	■	■	■	■	■	■	■					
<b>16. Links to other actions:</b>	<p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L04: Sewage collection and treatment facilities for Stone Town</li> <li>• Zan-L05: Sewage collection and treatment facilities for Zanzibar Town periphery</li> <li>• Zan-L09: Regional solid waste collection and processing facility, Unguja North</li> <li>• Zan-L14: Regional solid waste collection and processing facility, Unguja South</li> </ul>																									
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (solid wastes, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• ..</li> </ul>																									
<b>18. Comments:</b>																										

## Zan-L14: Regional Solid Waste Collection and Processing facility for Unguja South

<b>1. Background:</b>	<p>The coastal zone of Zanzibar is under development pressure from population growth and economic activities. The population of Pemba has reached its highest and the pollution of beaches and the marine environment have reached unprecedented levels. Sources include the drains, soak-away sewers, illegal dumping and rivers.</p> <p>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.</p> <p>Not much literature documents the amounts of solid wastes that enter coastal waters around the north and western shores of Unguja North, yet within large villages like Nungwi, Mkokotoni and northeast centres like Pwani Mchangani and Kiwengwa (among others) the inhabitants are 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 coastal productivity, fishing activities and tourism potential.</p>
<b>2. Title:</b>	Regional solid waste collection and processing facility, Unguja South
<b>3. Action Reference:</b>	Zan-L13
<b>4. Justification:</b>	<p>Beach pollution was ranked only at severity level 1 for the main southern villages in Unguja South Region, with marine pollution also identified as severity level 2. Despite these relatively low threat severity levels, the several hundreds of thousands of households in the large villages extending from Menai Bay to Michamvi (Kizimkazi, Makunduchi and north along the East coast to Jambiani, Paje and Bwejuu), lack of access to solid waste treatment systems means solid waste pollution to the marine environment is continuous. Furthermore, with projected population and development growth (associated with coastal villages and tourism development) in the coming years, all forms of pollution (and health problems) associated with the lack of an effective municipal collection and solid waste system at Unguja South are bound to deteriorate further. Inadequate solid waste control also contributes health problems from contaminated water as well as from water-borne diseases, ranked severity level 1 for Unguja South, affecting health of fishermen, bathers, tourists and urban residents.</p> <p>Marine life (e.g. fish and habitats) are similarly affected from resulting pollution - with fisheries decline ranked severity level 4 in Unguja South. The negative publicity aspect of visible solid waste affects visitors and tourists.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the households connected to solid waste collection and processing facility
<b>6. Expected outputs:</b>	<p>The outputs of the action to install a solid waste collection and processing facility in Unguja South are:</p> <ul style="list-style-type: none"> <li>• Fully operational solid waste collection and processing plant.</li> <li>• Effective and sustainable solid collection systems in place.</li> <li>• Reduced solid wastes discharged to sea and washed up along the coast.</li> <li>• Local LGA capable of managing sewage system.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering             <ol style="list-style-type: none"> <li>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 Unguja South</li> </ol> </li> </ol>

	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)	
<b>8. Assumptions:</b>	The Government of Zanzibar 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.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to information Green-green infrastructure</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Project managers</li> <li>• Civil and water engineers</li> <li>• Socio-economists, re-settlement specialists..</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	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, cables, 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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	Strong Government infrastructure development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	Local residents (several tens of thousands, plus thousands of annual tourist visitors) 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.	

<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
	<b>Solid waste collection/processing</b>																									
	<b>Unguja South</b>																									
	Project preparation and mobilisation	■																								
	Mobilisation/review of solid waste generation and design of specific needs			■																						
	Project management					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
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	Infrastructure						■	■	■																	
	Equipment										■	■	■													
	Site preparation: ground work, roads										■	■	■													
	Construction: civil, mechanical, contingency.														■	■	■									
Supplies, personnel (hiring and training/capacity building)										■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
<b>16. Links to other actions:</b>	<p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L12: Regional solid waste collection and processing facility, Unguja North</li> <li>• Zan-L13: Regional solid waste collection and processing facility, Unguja West and Urban</li> <li>• ...</li> </ul>																									
<b>17. Performance indicators:</b>	<ul style="list-style-type: none"> <li>• Water quality (solid wastes, etc.)</li> <li>• Volumes and types of solid wastes on associated beaches</li> <li>• ...</li> </ul>																									
<b>18. Comments:</b>																										

## Zan-L15: Study, review, design and trial freshwater supply options for Pemba Island

<b>1. Background:</b>	<p>The population of Pemba Island has reached its highest and the island as a whole is under development pressure from population growth and economic activities. Pemba has small surface water streams but lacks any major aquifers (unlike Unguja), and the few aquifers present do not have any transmissive structures and thus are only suitable for small local supply schemes. Pemba receives a relatively high annual rainwater volume (1,916 mm) yet freshwater supply continues to be a problem.</p> <p>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.</p> <p>Supply problems are well-documented and threaten livelihoods in future if the supplies and options are not well-understood. This uncertainty affects coastal communities and their productivity, agriculture (especially on Pemba where this is a vital economic activity) and the tourism industry.</p>
<b>2. Title:</b>	Study, review and design of freshwater supply options and trials for Pemba
<b>3. Action Reference:</b>	Zan-L15
<b>4. Justification:</b>	<p>On Pemba Island, inefficient management of piped water supply leading to leaks and loss of water, and inefficient management of water bodies has led to removal of riverine vegetation, erosion of riverbanks, degradation of water bodies or abstraction for water for agriculture (or livestock), were both threats ranked with a threat severity level 3. Lack of updated data on rivers sources is considered a threat ranked at level 4, made more pertinent by the uncertainties of climate change impacts. Meanwhile the increased demand from population and economic growth, as well as the degradation of catchments from changes in land use and/or livestock are threats also ranked at level 4.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the households with secure freshwater supply.
<b>6. Expected outputs:</b>	<p>The outputs of the action to study, review and design of supply options for on Pemba Island are:</p> <ul style="list-style-type: none"> <li>• Updated understanding of the freshwater supply options and conditions of these sources (aquifers, rivers, rainfall) for the island</li> <li>• Identification and understanding of areas where seawater intrusion is taking place</li> <li>• Definition of the areas where safe and reliable freshwater supplies (with combined sources) can be established with consolidation of “water committees”</li> <li>• Trial of rain harvesting and storage systems using alternative technology</li> <li>• Reduced contamination of rivers and aquifers</li> <li>• Reduced loss of freshwater</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering associated with supplying freshwater to the populations in the larger villages and towns of Pemba (or where water supply is most problematic), through review of needs and identification of source options</li> <li>2) Develop capacity in freshwater supply including from a range of sources</li> <li>3) Review and develop existing freshwater supply infrastructure and re-habilitate where appropriate</li> <li>4) Develop, review and implement a freshwater master plan for Pemba.</li> <li>5) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing freshwater usage on Pemba</li> <li>6) Trial a number of alternative supply systems (rain harvesting, boreholes, wells, river dams) where appropriate</li> </ol>

<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the provision of clean and reliable drinking water to the population of Pemba. Local residents and businesses are supportive of initiatives to improve their environment and supply of freshwater.																																																																																																																																																																																																																																																																																					
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.																																																																																																																																																																																																																																																																																					
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Green-green infrastructure,</li> <li>• IWRM planning</li> <li>• Drilling and borehole/ well sampling equipment</li> <li>• ...</li> </ul>																																																																																																																																																																																																																																																																																				
	Human Resources	<ul style="list-style-type: none"> <li>• Civil and water engineers</li> <li>• Pollution chemists</li> <li>• Socio-economists</li> <li>• Alternative energy specialists</li> <li>• Rain harvesting experts</li> </ul>																																																																																																																																																																																																																																																																																				
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<b>14. Beneficiary from the action:</b>	Local residents (over 400,000, 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.																																																																																																																																																																																																																																																																																					
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<b>16. Links to other actions:</b>	<p>Links to following systemic actions would be desirable:</p> <ul style="list-style-type: none"> <li>• Zan-S01: Integrated Coastal Zone Management</li> <li>• Zan-S02: Spatial Planning</li> <li>• Zan-S04: Information Management</li> <li>• Zan-S06: Awareness Raising</li> </ul> <p>Of particular relevance and importance would be links to:</p> <ul style="list-style-type: none"> <li>• Zan-L16: Study, review and design of freshwater supply options for Unguja</li> </ul>
<b>17. Performance indicators:</b>	Freshwater quality (chemistry, BOD, etc.), volumes and supply rates.
<b>18. Comments:</b>	Two solar desalination units are being piloted for remote communities, one of them on a small island of the Pemba coast. Lessons learnt from that initiative would be useful going forward with Zan-L15.

## Zan-L16: Study, review and design of freshwater supply options for Unguja

<b>1. Background:</b>	<p>The population of Unguja Island has reached its highest and the island as a whole is under development pressure from population growth and economic activities. Unguja has very little surface water but holds enormous major aquifers (unlike Pemba) that have been the main source of freshwater for the island. Unguja receives a relatively moderate annual rainwater volume (1,565 mm) yet despite the aquifer's alleged volume, water supply continues to be a problem.</p> <p>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.</p> <p>Water supply problems are well-documented and threaten livelihoods in future if the supplies and options are not well-understood. Studies in the 1990s documented large aquifers that have since then been heavily utilised. The continued uncertainty affects coastal communities and their productivity, as well as agriculture and tourism (the latter especially on Unguja where this is a vital economic activity).</p>
<b>2. Title:</b>	Review and update of Freshwater supply options for Unguja Island
<b>3. Action Reference:</b>	Zan-L16
<b>4. Justification:</b>	<p>On Unguja Island, inefficient management of piped water supply leading to leaks and loss of water (e.g. 35-40% on Unguja) was a threat ranked with a severity level 3, while lack of updated data on aquifer sources leading to failure to comprehensively control water supplies was considered a threat ranked at level 4, made more pertinent by the uncertainties of climate change impacts. Meanwhile, the increased demand from population and economic growth (a level 4 threat) is accompanied by the threat from demands by the tourism sector that was ranked a level 3 threat.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the households with secure freshwater supply.
<b>6. Expected outputs:</b>	<p>The outputs of the action to study, review and design of supply options for on Unguja Island are:</p> <ul style="list-style-type: none"> <li>• Updated understanding of the freshwater supply options and conditions of these sources (aquifers, rivers, rainfall) for the island</li> <li>• Identification and understanding of areas where seawater intrusion is taking place</li> <li>• Definition of the areas where safe and reliable freshwater supplies (with combined sources) can be established with consolidation of "water committees"</li> <li>• Trial of rain harvesting and storage systems using alternative technology</li> <li>• Reduced contamination of rivers and aquifers</li> <li>• Reduced loss of freshwater</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Initial studies, design and engineering associated with supplying freshwater to the populations in the larger villages and towns of Pemba (or where water supply is most problematic), through review of needs and identification of source options</li> <li>2) Develop capacity in freshwater supply including from a range of sources</li> <li>3) Review and develop existing freshwater supply infrastructure and re-habilitate where appropriate</li> <li>4) Develop, review and implement a freshwater master plan for Unguja.</li> <li>5) Review, develop, implement and enforce relevant legislative/regulatory instruments addressing freshwater usage on Unguja</li> <li>6) Trial a number of alternative supply systems (rain harvesting, boreholes, wells, river dams) where appropriate</li> </ol>



<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the provision of clean and reliable drinking water to the population of Unguja. Local residents and businesses are supportive of initiatives to improve their environment and supply of freshwater.																																																																																																																																																																																																																																																																															
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<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Green-green infrastructure,</li> <li>• IWRM planning</li> <li>• Drilling and borehole/well sampling equipment</li> <li>•</li> </ul>																																																																																																																																																																																																																																																																														
	Human Resources	<ul style="list-style-type: none"> <li>• Civil and water engineers</li> <li>• Pollution chemists</li> <li>• Socio-economists</li> <li>• Alternative energy specialists</li> <li>• Rain harvesting experts</li> </ul>																																																																																																																																																																																																																																																																														
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	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.																																																																																																																																																																																																																																																																															
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																																															
<b>13. Responsible for the action:</b>	Strong Government water development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• etc...</li> </ul>																																																																																																																																																																																																																																																																															
<b>14. Beneficiary from the action:</b>	<p>Local residents (over 1,600,000, 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.</p> <p>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.</p>																																																																																																																																																																																																																																																																															
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<b>16. Links to other actions:</b>	<ul style="list-style-type: none"> <li>• Zan-L02: Rehabilitation of three northwest-flowing streams in Unguja Urban and West</li> <li>• Zan-L01: Rehabilitation of five west-flowing streams in Unguja Urban and West</li> </ul>
<b>17. Performance indicators:</b>	Freshwater quality (chemistry, BOD, etc.), volumes and supply rates.
<b>18. Comments:</b>	<p>A new climate-future-proof water supply system has been designed for Stone Town, and provided funding will materialise as expected from AfDB the supply system will be upgraded in 2013-2015. JICA is also supporting the water sector in Zanzibar (ZAWA), with TA support and investment funds. The two AfDB projects also include some additional borehole drilling, a monitoring system, and integrated water management. There are also some early pilots on rainwater harvesting, as well as studies of price structuring which could encourage water efficiency. There are also a number of small desalination plants on Zanzibar in some tourist hotels for supply of drinking water.</p>

## Zan-L17: Zanzibar fisheries sector review by fishery type and management areas

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale fishery sector in Zanzibar supports a significant proportion of local livelihoods. In 2007, the Joint Frame Survey estimated that the activity provided full time employment for over 34,268 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit.</p> <p>The pragmatic outlook on the fisheries sector on Zanzibar 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.</p> <p>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.</p> <p>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 in Zanzibar, especially within and outside of the many marine conservation areas. On mainland Tanzania there are now 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. The equivalent for Zanzibar has not been undertaken and is an important gap in the management of the fisheries in the present day.</p>
<p><b>2. Title:</b></p>	<p>Zanzibar fisheries sector review by fishery type and management areas</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L17</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all five regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over gears ranked 4 and 3 respectively. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated.</p> <p>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 the Fisheries Act (2010) 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 sea around Zanzibar and enter into its port, as highlighted by the recent SWIOfish study of Swan (2013).</p>
<p><b>5. Objective:</b></p>	<p>By 2025 the key fishery types sustainably managed with stable MSY and decreased use of destructive gears.</p>

<b>6. Expected outputs:</b>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support the fishery review on Zanzibar are:</p> <ul style="list-style-type: none"> <li>• Updated understanding of the fishery types (octopus, small pelagic, large pelagic and mixed reef fish) through detailed fisheries management plans</li> <li>• A review and analysis of long-term datasets and an assessment of their usefulness for fisheries management</li> <li>• Appropriate and reliable alternative fisheries data collection methods designed</li> <li>• Assessments of status of stocks and derived effort levels for sustainable yields.</li> <li>• Assessment and harmonization of Fisheries Act (2010) in line with the findings of the fisheries review and recommended fisheries management plans for fishery types</li> <li>• Local fisheries capacity developed to undertake continued and effective monitoring and management of the main fishery types</li> </ul>																		
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Review and analyse catch records to assess the usefulness of the dataset, and improve data collection protocols</li> <li>2) Collect additional catch and effort information for ground-truthing</li> <li>3) Implement improved catch assessment survey (CAS) for two years</li> <li>4) Develop fisheries management plans to address the principle fishery types: octopus, tuna and tuna-like species, small pelagic species and mixed reef fisheries</li> <li>5) Conduct two modernized and data-integrated frame surveys over next five years</li> <li>6) Review and revise Fisheries Act (2010) in line with marine relevant management plans and conservation areas</li> <li>7) Capacity building with relevant fisheries institutions and beach recorders</li> </ol>																		
<b>8. Assumptions:</b>	<p>The Government of Zanzibar is committed to supporting the improvement of fisheries for the benefit of the population of Unguja and Pemba. Local residents and businesses are supportive of initiatives to improve management of the principle fisheries.</p>																		
<b>9. Risks:</b>	<p>Local residents and businesses may object and manage to block the project.</p>																		
<b>10. Means of implementation:</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%; padding: 5px;">Logistics, technical, scientific</td> <td style="padding: 5px;"> <ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to fisheries data/information</li> <li>...</li> </ul> </td> </tr> <tr> <td style="padding: 5px;">Human Resources</td> <td style="padding: 5px;"> <ul style="list-style-type: none"> <li>• Fisheries scientists (fisheries management, ecology, data management, socio-economists)</li> <li>• Fisheries trainers</li> <li>• Master fisherman</li> <li>• ...</li> </ul> </td> </tr> </table>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to fisheries data/information</li> <li>...</li> </ul>	Human Resources	<ul style="list-style-type: none"> <li>• Fisheries scientists (fisheries management, ecology, data management, socio-economists)</li> <li>• Fisheries trainers</li> <li>• Master fisherman</li> <li>• ...</li> </ul>														
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## Zan-L18: Small pelagic fisheries support on Zanzibar

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale fishery sector in Zanzibar supports a significant proportion of local livelihoods. In 2007, the Joint Frame Survey estimated that the activity provided full time employment for over 34,268 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit.</p> <p>Small pelagics (Clupeids, Scombrids, Engraulids) made up 68% of the marine catch in recent years (Groeneveld et al 2014). Off Zanzibar they are caught off the western shores, with concentrations at Zanzibar Town and Chake Chake and Mkoani, Pemba. 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.</p> <p>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.</p> <p>The pragmatic outlook on the fisheries sector on Zanzibar 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.</p> <p>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.</p>
<p><b>2. Title:</b></p>	<p>Small pelagic fisheries support programme for Zanzibar</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L18</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all five regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over gears ranked 4 and 3 respectively. The</p>

	<p>significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated.</p> <p>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, in prep).</p>
<b>5. Objective:</b>	By 2025 the small pelagic fishery is sustainably managed and developments are place for a sardine cannery.
<b>6. Expected outputs:</b>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the Action to support the small pelagic fishery on Zanzibar are:</p> <ul style="list-style-type: none"> <li>• Updated understanding of the fishery</li> <li>• A review and analysis of long-term datasets to assess their usefulness for fisheries management</li> <li>• Develop simple stock status indicators for the most important small pelagics groups</li> <li>• Assess status of stocks and derive effort levels for sustainable yields</li> <li>• Assess long-term dynamics of small pelagic fishery productivity through modelling of catch rates and oceanographic / environmental parameters</li> <li>• Investigate spatial and seasonal trends in fishing patterns along the coast as framework for spatial management of fishing effort</li> <li>• Complete a feasibility study for the establishment of a sardine cannery on Zanzibar and engage the private sector in its development (if considered viable)</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Review and analyse previous catch data to assess the usefulness of the dataset, and improve data collection protocols.</li> <li>2) Collect additional catch and effort information for ground-truthing (over 4 years)</li> <li>3) Implement improved catch assessment survey (CAS) for two years</li> <li>4) Work with fishing units to install vessel monitoring systems (VMS) to monitor movements, in exchange for e.g. solar lamps and other equipment</li> <li>5) Assess seasonal changes in species composition; spatiotemporal shifts in fishing effort trends along the coast; and reconstruct total catch from the fishery.</li> <li>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.</li> <li>8) Develop fisheries management plans to address the small pelagic species fisheries</li> <li>9) Conduct two modernized and data-integrated frame surveys over next five years to provide accurate data on small pelagic fishery effort</li> <li>10) Capacity building with relevant fisheries institutions and beach recorders</li> </ol>
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the improvement of fisheries for the benefit of the population of Unguja and Pemba. Local residents and businesses are supportive of initiatives to improve their small pelagic fishery.
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.

<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to fisheries data/information</li> <li>• VMS units (x50)</li> <li>• Solar lamps and ancillary equipment (x100)</li> <li>• ...</li> </ul>																								
	Human Resources	<ul style="list-style-type: none"> <li>• Fisheries scientists (ecology, data management, socio-economists, economist)</li> <li>• Business consultants</li> <li>• ...</li> </ul>																								
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<b>13. Responsible for the action:</b>	Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts: <ul style="list-style-type: none"> <li>• Contractors</li> <li>• NGOs</li> <li>• etc...</li> </ul>																									
<b>14. Beneficiary from the action:</b>	Local residents (two 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.																									



<b>15. Schedule:</b>	<b>Actions and Activities</b>	<b>Year 1</b>				<b>Year 2</b>				<b>Year 3</b>				<b>Year 4</b>				<b>Year 5</b>				<b>Y6</b>	<b>Y7</b>	<b>Y8</b>	<b>Y9</b>	<b>Y10</b>
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<b>16. Links to other actions:</b>	<p>Zan-L17: Zanzibar fisheries sector review by fishery types and management areas</p> <p>Zan-L19: Zanzibar fisheries MCS programme</p> <p>Zan-L20: Strengthening management of octopus fisheries on Zanzibar</p> <p>Zan-L21: Strengthening seaweed farming in Zanzibar</p> <p>Zan-L22: Semi-industrial offshore tuna fisheries support programme</p> <p>Zan-L23: Strengthening fish mariculture in Zanzibar</p> <p>Zan-S01: Integrated Coastal Zone Management Framework</p>																									
<b>17. Performance indicators:</b>	Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.																									
<b>18. Comments:</b>	<p>References:</p> <p>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.</p> <p>URT 2013. Management plan for the Tanzanian artisanal fishery for small and medium pelagic fish species. Ministry of Livestock and Fisheries Development. 20 pp.</p>																									

## Zan-L19: Support for Zanzibar fisheries MCS programme

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale fishery sector in Zanzibar supports a significant proportion of local livelihoods. In 2007, the Joint Frame Survey estimated that the activity provided full time employment for over 34,268 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit.</p> <p>The pragmatic outlook on the fisheries sector on Zanzibar 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. Other than attempt to generate or harvest greater amounts of fish from the natural environment, one other alternative is to reduce the degradation of the fish habitats from destructive and illegal fishing activities. Two well-known such activities are the use of beach seine nets and the use of small-meshed purse seine nets around coral reefs, a practice known as “kigumi” fishery. Reducing destructive fishery practices will over time result in increased production.</p> <p>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.</p> <p>There is a very weak history of enforcement of fisheries regulations in Zanzibar and worse on 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 the confusing and at times contradictory legislation. In the case of the “kigumi” practice whereby the nets used are not illegal but the way they are used (involving smashing corals to force fish out) is destructive and illegal – though this is not clear. The need to firmly address fisheries control and surveillance on Zanzibar has been re-iterated recently by Malan (2014) while working on the SWIOfish study on MCS.</p> <p>Zanzibar has relatively strong traditional local governance of fisheries, 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 traditionally under the use interest and monitoring of that village. Such a structure bodes well for MCS at village level.</p>
<p><b>2. Title:</b></p>	<p>Support for Zanzibar fisheries monitoring, control and surveillance programme</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L19</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all five regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over gears ranked 4 and 3 respectively. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated.</p> <p>It is widely accepted that there is insufficient monitoring, control and surveillance of the inshore waters of Zanzibar 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</p>

	<p>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 unlicensed (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.</p> <p>The impacts on local fisheries from the effects of climate change can be significant, particularly from (i) sea temperature rise, (ii) ocean acidification and, potentially, (iii) higher frequency of extreme rainfall events, that potential negatively larval stages, planktonic food sources and coral reef-related systems and access to the resource. Support for MCS thus becomes a higher priority to lessen other stresses on reef environments, chiefly as it is not possible to directly mitigate the other stressors.</p>
<b>5. Objective:</b>	By 2025 at least 80% of the fisheries activities comply with regulations.
<b>6. Expected outputs:</b>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the action to implement the Zanzibar fisheries MCS programme on Zanzibar are divided into two phases:</p> <p>Phase I – within 3 years</p> <ul style="list-style-type: none"> <li>• All fishers and vessels in Pemba and Unguja are registered</li> <li>• All fishing activities for tuna (gill-net) and small pelagic (ring-nets) should have their gears, vessels and fishers registered and licenced</li> <li>• All licenced vessels associated with tuna (gill-net) and small pelagic (ring-net) clearly marked and identifiable</li> <li>• All boat skippers of tuna gill-net and small-pelagic ring-net operations with weatherproof fishing licence</li> <li>• Effective and sustainable management of the tuna and small pelagic fisheries</li> <li>• Reduced entry of non-registered/licenced fishers into the tuna (gill-net) and small pelagic (ring-net) fisheries</li> <li>• Pending review of Fisheries Act (2010) in line with marine relevant management plans and conservation areas (see ZAN-17), illegal fisheries such as beach seining in forbidden areas or ring-netting (“kojani”) around coral areas is effectively banned within 3 years</li> <li>• 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</li> </ul> <p>Phase II – within 6 years</p> <ul style="list-style-type: none"> <li>• All mixed reef fishing activities (using dugout paddle/sail or outrigger canoes) should have their gears, vessels and fishers registered and licenced</li> <li>• All boat skippers of mixed reef fisheries operations with weatherproof fishing licence</li> <li>• All licenced vessels associated with mixed reef fishery clearly marked and identifiable</li> <li>• All octopus fishers registered and licenced with weatherproof fishing licence</li> </ul>
<b>7. Activities:</b>	<p>a) Project design and appraisal. b) Project tendering</p> <p>Phase I</p> <ol style="list-style-type: none"> <li>1) Pilot project be launched in selected fishing areas, based on four priority fisheries mentioned above (see ZAN-17) for which management plans will have already been developed, beginning with small pelagic and gill-net tuna fisheries (first 3 years), and in a second phase expanding to the mixed reef and octopus fisheries (within six years)</li> <li>2) Pilot project expanded to cover entire fishery for tuna and small pelagic species</li> <li>3) CFC’s and district officers used to routinely check that fishers are indeed licenced, with penalties not needing to be draconian, but significant enough to discourage unlicensed fishing, and licenced boats are clearly marked with licence number (e.g. car plate type)</li> <li>4) Inspections of catches at landing sites must include checking on the licences</li> <li>5) Investigate mechanisms of using a fixed portion of licence fees to fund district offices and CFCs. The emphasis being that the funding must be ring-fenced for MCS and fisheries</li> </ol>

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<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																																																																																																																																									
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<b>16. Links to other actions:</b>	<p>Zan-L17: Zanzibar fisheries sector review by fishery types and management areas  Zan-L18: Small pelagic fisheries support on Zanzibar  Zan-L20: Strengthening management of octopus fisheries on Zanzibar  Zan-L22: Tuna fisheries support programme  Zan-L23: Strengthening fish mariculture in Zanzibar  Zan-S01: Integrated Coastal Zone Management Framework</p>																																																																																																																																																																																																																																																																																																																																																																									
<b>17. Performance indicators:</b>	<p>Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort; reduced incidences of infringement.</p>																																																																																																																																																																																																																																																																																																																																																																									
<b>18. Comments:</b>	<p>References:</p> <p>Malan, P. 2014. The state of Monitoring, Control and Surveillance in the United Republic of Tanzania. A report for SWIOFish.</p> <p>Mkenda, AF and Folmer, H. 2001. The Maximum Sustainable Yield of Artisanal Fishery in Zanzibar: A Cointegration Approach. <i>Environmental and Resource Economics</i> <b>19</b>: 311-328, 2001.</p>																																																																																																																																																																																																																																																																																																																																																																									

## Zan-L20: Strengthening management of octopus fisheries on Zanzibar

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale fishery sector in Zanzibar supports a significant proportion of local livelihoods. In 2007, the Joint Frame Survey estimated that the activity provided full time employment for over 34,268 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit.</p> <p>While the pragmatic outlook on the fisheries sector on Zanzibar is that there is little room for expansion and the current and increasing pressure is damaging the productivity, with catches unlikely to increase with more fishing effort, and some potential increase from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture, the octopus fishery deserves attention.</p> <p>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.</p> <p>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).</p>
<p><b>2. Title:</b></p>	<p>Strengthening the management of octopus fisheries on Zanzibar</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L20</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all five regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over gears ranked 4 and 3 respectively. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated.</p> <p>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.</p>
<p><b>5. Objective:</b></p>	<p>By 2025 the octopus fishery is sustainably managed.</p>
<p><b>6. Expected outputs:</b></p>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support the octopus fishery on Zanzibar are:</p> <ul style="list-style-type: none"> <li>• Simple indicators developed that rely on basic information to assess relative octopus stock status</li> <li>• Traditional fisheries management methods (i.e. closed seasons/areas) tested for their validity as an alternative management strategy.</li> <li>• Genetic stock structure of <i>Octopus cyanea</i> at Zanzibar investigated (for comparison with wider SWIO region stock)</li> <li>• Octopus fishery management systems strengthened with the aim of eventually applying for eco-labelling of products.</li> </ul>
<p><b>7. Activities:</b></p>	<p>a) Project design and appraisal.  b) Project tendering</p> <ol style="list-style-type: none"> <li>1) Review and analyse previous catch data to assess the usefulness of the dataset, and improve data collection protocols</li> <li>2) Collect additional catch and effort information (from different areas and water depths) for ground-truthing with subsampling to obtain biological information (reproductive</li> </ol>

	<p>details, size, etc.) to be used for indicator developments (over 4 years) and update indicators regularly for management purposes</p> <p>3) Work with fishing units (50) to closely monitor movements, in exchange for e.g. solar lamps and other equipment</p> <p>4) Conduct population genetics study of fished populations (2 above)</p> <p>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</p> <p>6) Work with local fishers to trial and compare traditional closed season management approach for validation and analysis of subsequent harvest individuals</p> <p>7) Develop fisheries management plans to address the octopus fishery</p> <p>8) Capacity building with relevant fisheries institutions and beach recorders</p>	
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the improvement of fisheries for the benefit of the population of Unguja and Pemba. Local residents and businesses are supportive of initiatives to improve their small pelagic fishery.	
<b>9. Risks:</b>	Local residents and businesses may object and manage to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to fisheries data/information</li> <li>• Solar lamps and ancillary equipment (x100) for octopus fishers</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Fisheries scientists (ecology, data management, socio-economists, economist)</li> <li>• Genetic tissue analyst</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	Project preparation and mobilisation	100,000
	Project management	200,000
	Review and analyse catch records	na
	Collect additional catch and effort information for ground-truthing (focused on biological condition, from range of depths and areas) over 4 years	200,000
	Implement improved catch assessment survey (CAS) for two years	na
	Develop fisheries management plan for octopus fishery	na
	Work with fishing units (50) to collect details movement and effort data in exchange for equipment for three years	150,000
	Assess seasonal changes and model variability in catches/reproductive condition relative to long term environmental/oceanographic information	200,000
	Sample and dispatch tissue for genetic study and interpretation of results	50,000
	Equipment, supplies, personnel, capacity building	100,000
	<b>Total</b>	<b>1,000,000</b>
	<p>The coarse budget does not provide for reviewing existing catch data, frame survey data collection, implementing revised catch assessment nor development of the octopus fisheries management plan, provided that these activities are undertaken as part of a separate initiative Zan-L17: Zanzibar fisheries sector review by fishery type and management areas. Costing for these elements is provide under Zan-L17.</p>	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> </ul>	

	<ul style="list-style-type: none"> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																																									
<b>13. Responsible for the action:</b>	<p>Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• NGOs</li> <li>• etc...</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																																									
<b>14. Beneficiary from the action:</b>	<p>Local residents (1.4 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.</p> <p>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.</p>																																																																																																																																																																																																																																																																																																																																																																																																																									
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<b>16. Links to other actions:</b>	<p>Zan-L03: Coastal erosion study  Zan-L17: Zanzibar fisheries sector review by fishery types and management areas  Zan-L19: Zanzibar fisheries MCS programme  Zan-L21: Strengthening seaweed farming in Zanzibar  Zan-S01: Integrated Coastal Zone Management Framework</p>																																																																																																																																																																																																																																																																																																																																																																																																																									
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## Zan-L21: Strengthening the seaweed farming industry on Zanzibar

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale seaweed farming sector in Zanzibar supports a significant proportion of local livelihoods, in an activity that started in 1989. Some 23,000 people at 80 villages in Zanzibar participate in seaweed farming, of which 90% are women. Seaweed of the genus <i>Eucheema</i> is cultured in the shallow subtidal along the coast of Zanzibar, using lines strung above the sea bottom. The product is harvested in 6 weeks, dried, and sold to six companies that export it.</p> <p>Problems associated with the industry include massive decline in productivity in Unguja seaweed farms, with failure of some varieties to grow; inability or difficulty of culture of deeper water species in Unguja compared to Pemba; conflicts with buyers over pricing and health complications associated with the time spent in the shallow water while tending to the seaweed lines.</p> <p>While the pragmatic outlook on the fisheries sector on Zanzibar is that there is little room for expansion and the current and increasing pressure is damaging the productivity, with catches unlikely to increase with more fishing effort, and some potential increase from improvements in efficiency and/or value-added in the small pelagic fishery and from coastal aquaculture. Enhancing seaweed production is one activity that has been recommended by various sources including the recent SWIOfish study by Groeneveld et al (2014).</p> <p>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.</p> <p>There are several studies seaweed farming on Zanzibar, e.g. SMOLE supported study by Frocklin et al . (2012) which have made recommendations on means to improve the income and benefits from the farming of seaweed. The formation of the Zanzibar Seaweed Cluster has significantly improved the diversity and subsequent income associated with the production of seaweed and derivative products like soaps, oils, foodstuffs etc.</p>
<p><b>2. Title:</b></p>	<p>Research to strengthen seaweed mariculture on Zanzibar</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L21</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over gears ranked 4 and 3 respectively. The significance of the threats posed by fishers and by the decline in fisheries production (CPUE) cannot be overstated.</p> <p>It is widely accepted that there is incomplete knowledge on the seaweed farming industry on Zanzibar (and mainland Tanzania) 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 Unguja and the increased production from Pemba, whether there are changes in coastal water conditions that favour or hinder growth, and to address health complications associated tending to the seaweed lines</p>
<p><b>5. Objective:</b></p>	<p>By 2025 the seaweed farming industry is equitably managed for the benefit of producers, buyers and the environment.</p>

<b>6. Expected outputs:</b>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the Action to support the seaweed farming industry on Zanzibar are:</p> <ul style="list-style-type: none"> <li>• Developed and implemented Seaweed Management Plan.</li> <li>• Strengthened Seaweed Unit in the Marine Resources Department.</li> <li>• Investigated value-adding at local level.</li> <li>• Differences in the species growth, water conditions between Pemba and Unguja investigated to assist determine factors affecting differences in production from the two areas.</li> <li>• Investigated boosting formation of cooperatives and groups such as the Zanzibar Seaweed Cluster to assist diversify income and boost revenue from local production.</li> <li>• Feasibility study completed on the potential for a seaweed processing facility on Zanzibar.</li> </ul>																			
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering <ol style="list-style-type: none"> <li>1) Develop a Seaweed Management Plan</li> <li>2) Review and analyse previous harvest data to assess the usefulness of the dataset, and improve data collection protocols</li> <li>3) Work with farming units (50) to closely monitor movements, in exchange for e.g. relevant equipment</li> <li>4) Assess whether the relevant department in fisheries is appropriately staffed, and if not strengthen the Unit</li> <li>5) Research the scope for value addition: making seaweed soap, attractiveness of products improved, processing and market research, promotion and customer reactions</li> <li>6) Research new strains and farming method that could extend farms into slightly deeper water – thus expanding the capacity of Zanzibar for seaweed farming</li> <li>7) Assess seasonal changes in species yields; spatio-temporal shifts in yields per unit effort trends along the coast and between Unguja and Pemba</li> <li>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</li> <li>9) Conduct feasibility study on facility required for semi-processed or fully processed product for export at a higher price.</li> </ol> </li> </ol>																			
<b>8. Assumptions:</b>	<p>The Government of Zanzibar is committed to supporting the improvement of seaweed production for the benefit of the population of Unguja and Pemba. Local residents and businesses are supportive of initiatives to improve their seaweed farming industry.</p>																			
<b>9. Risks:</b>	<p>Local residents and businesses may object and manage to block the project.</p>																			
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to seaweed harvest data/information</li> </ul>																		
	Human Resources	<ul style="list-style-type: none"> <li>• Seaweed scientists (ecology, data management, socio-economists, economist)</li> <li>• Marine ecologists</li> </ul>																		
<b>11. Budget estimate:</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Item</th> <th style="width: 30%;">Estimate in USD</th> </tr> </thead> <tbody> <tr> <td>Project preparation and mobilisation</td> <td style="text-align: right;">100,000</td> </tr> <tr> <td>Project management</td> <td style="text-align: right;">200,000</td> </tr> <tr> <td>Review and analyse harvested records</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>Explore new strains viable for cultivation on Zanzibar</td> <td style="text-align: right;">100,000</td> </tr> <tr> <td>Develop seaweed management plan for Zanzibar</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>Work with farming groups to better understand potential value-added interventions</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>Implement the seaweed management plan</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>Assess seasonal changes and model variability in production per unit effort vs conditions relative to long</td> <td style="text-align: right;">200,000</td> </tr> </tbody> </table>		Item	Estimate in USD	Project preparation and mobilisation	100,000	Project management	200,000	Review and analyse harvested records	50,000	Explore new strains viable for cultivation on Zanzibar	100,000	Develop seaweed management plan for Zanzibar	50,000	Work with farming groups to better understand potential value-added interventions	50,000	Implement the seaweed management plan	50,000	Assess seasonal changes and model variability in production per unit effort vs conditions relative to long	200,000
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<b>13. Responsible for the action:</b>	<p>Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• NGOs</li> <li>• etc...</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																											
<b>14. Beneficiary from the action:</b>	<p>Local farmers (20-30,000) in terms of improved reliability of harvest of seaweed, and from enhanced production.</p> <p>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.</p>																																																																																																																																																																																																																																																																																																																																																																																											
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<b>16. Links to other actions:</b>	<p>Zan-L03: Coastal erosion study  Zan-L17: Zanzibar fisheries sector review by fishery types and management areas  Zan-S01: Integrated Coastal Zone Management Framework</p>																																																																																																																																																																																																																																																																																																																																																																																											
<b>17. Performance indicators:</b>	<p>Increased and sustained seaweed harvest per unit effort; improved quality of seaweed landed; stabilised or increased farming effort.</p>																																																																																																																																																																																																																																																																																																																																																																																											
	<p>References:</p> <p>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? <i>Aquaculture</i>, 356–357: 30–39.</p> <p>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.</p>																																																																																																																																																																																																																																																																																																																																																																																											

## Zan-L22: Tuna fisheries support programme for Zanzibar

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale fishery sector in Zanzibar supports a significant proportion of local livelihoods. In 2007, the Joint Frame Survey estimated that the activity provided full time employment for over 34,268 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit.</p> <p>While the pragmatic outlook on the fisheries sector on Zanzibar is that there is little room for expansion and the current and increasing pressure is damaging the productivity, with catches unlikely to increase with more fishing effort, and some potential increase from improvements in efficiency and/or value-added in the small pelagic fishery, from coastal aquaculture, and from offshore resources such as the tuna fishery.</p> <p>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.</p> <p>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 &amp; 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 Nungwi).</p> <p>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.</p> <p>Tuna is a fast growing fish species with movements of schools throughout the western and northwestern Indian Ocean. Fish caught off Zanzibar 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.</p> <p>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.</p>
<p><b>2. Title:</b></p>	<p>Tuna fisheries support programme on Zanzibar</p>
<p><b>3. Action Reference:</b></p>	<p>ZAN-L22</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all five regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over</p>

	<p>gears ranked 4 and 3 respectively. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated.</p> <p>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.</p>		
<b>5. Objective:</b>	By 2025 the tuna fishery is sustainably managed and yield per unit effort increased.		
<b>6. Expected outputs:</b>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support the tuna fishery on Zanzibar are:</p> <ul style="list-style-type: none"> <li>• Simple stock status indicators developed for the most important neritic tuna species</li> <li>• Main fishing grounds used by small-scale fishers (GPS and VMS tracking) mapped</li> <li>• Genetic stock structure of key neritic species (regional project) identified</li> <li>• IOTC compliance strengthened by improving reporting standards (resolution of catch</li> <li>• IOTC working parties hosted at DSFA</li> <li>• Data of neritic tunas to species level recorded</li> <li>• Reviewed and improved links between TAFIRI (as applied research facility) and the DSFA and the two Fisheries Departments (management facilities) (5 years).</li> <li>• New semi-industrial fishing methods for targeting medium and large pelagics trialled , i.e. pole-and-line, droplines and FADs, with lessons learnt during previous trials taken into account first</li> <li>• Bycatches of sharks and rays made by pelagic longliners assessed</li> </ul>		
<b>7. Activities:</b>	<p>a) Project design and appraisal.  b) Project tendering</p> <ol style="list-style-type: none"> <li>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</li> <li>2) Identify hotspots of neritic tunas and sample to species level to obtain a realistic species breakdown for Tanzania for IOTC reporting purposes</li> <li>3) Train samplers to identify large and medium pelagics to species level (2 years) through development and production of fisheries handbooks</li> <li>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).</li> <li>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).</li> <li>6) Construct and test FADs in nearshore waters (3 years).</li> <li>7) Trial pole-and-line and dropline fishing (3 years).</li> <li>8) Host some of the IOTC working parties, to raise awareness internally and also improve chances of getting IOTC quota (5 years).</li> <li>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.</li> </ol>		
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the improvement of fisheries for the benefit of the population of Unguja and Pemba. Local residents and businesses are supportive of initiatives to improve their small pelagic fishery.		
<b>9. Risks:</b>	Local residents and businesses may object and managed to block the project.		
<b>10. Means of implementation:</b>	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Logistics, technical, scientific</td> <td> <ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> </ul> </td> </tr> </table>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> </ul>
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		<ul style="list-style-type: none"> <li>• Access to fisheries data/information</li> <li>• GPS, mobile phones and VMS units (10)</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Fisheries scientists (ecology, data management, socio-economists, fisheries economist)</li> <li>• Master fisherman</li> <li>• FAD expert</li> <li>• ...</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	Project preparation and mobilisation	100,000
	Project management	200,000
	Review and analyse existing catch records	na
	Collect additional catch and effort information for ground-truthing (focused on biological condition, from range of depths and areas) over 3 years	200,000
	Implement improved catch assessment survey (CAS) for 3 years	na
	Develop and implement the fisheries management plan for tuna fishery	na
	Work with fishing units (10) to collect details movement and effort data in exchange for equipment for three years	200,000
	Assess seasonal changes and model variability in catches/reproductive condition relative to long term environmental/oceanographic information	200,000
	Sample and dispatch tuna and other species tissue for genetic study and reporting	200,000
	Trial FAD fishing for 3 years	200,000
	Trial pole-and-line and dropline fishing, including charter/purchase of suitable vessel of for 3 years	500,000
	Host some of the IOTC working parties, to raise awareness internally and also improve chances of getting IOTC quota (5 years)	200,000
	Equipment, supplies, personnel, capacity building	400,000
	<b>Total</b>	<b>2,400,000</b>
	<p>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 ZAN-L17: Zanzibar fisheries sector review by fishery type and management areas. Costing for these elements is provide under ZAN-L17.</p>	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	
<b>13. Responsible for the action:</b>	<p>Strong Local Government fisheries development stakeholder capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Contractors</li> <li>• NGOs</li> <li>• etc...</li> </ul>	
<b>14. Beneficiary from the action:</b>	<p>Local residents (1.4 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.</p>	

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:	Actions and Activities	Year 1				Year 2				Year 3				Year 4				Year 5				Y6	Y7	Y8	Y9	Y10	
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
<b>Tuna fisheries support for Zanzibar</b>																											
Project preparation and mobilisation		█																									
Review of tuna catch records						█																					
Project management						█				█				█				█									
Conduct frame survey, focused on tuna fishery						█												█									
Collect additional catch/effort data - groundtruthing for tuna						█				█				█				█									
Implement improved catch assessment survey (CAS) for tuna										█				█				█									
Develop tuna pelagics fisheries management plan										█				█				█									
Implement tuna Fisheries Management Plan																		█									
Work with fishing units (10) Trial FADs						█				█				█				█									
Trial pole-and-line and dropline fishing										█				█				█									
Assess seasonal changes and model vs climate/oceanographic parameters and map hot-spots and share data with IOTC						█				█				█				█									
Conduct population genetics study of fished populations										█				█				█									
Host two IOTC working parties						█												█									
Equipment, supplies, personnel (hiring and training/ capacity building)						█				█				█				█									

**16. Links to other actions:**  
 Zan-L17: Zanzibar fisheries sector review by fishery types and management areas  
 Zan-L19: Zanzibar fisheries MCS programme  
 Zan-S01: ICZM framework

**17. Performance indicators:**  
 Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.

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.

## Zan-L23: Fish farming research and cage trials on Pemba Island

<p><b>1. Background:</b></p>	<p>The artisanal/small-scale fishery sector in Zanzibar supports a significant proportion of local livelihoods. In 2007, the Joint Frame Survey estimated that the activity provided full time employment for over 34,268 people with thousands more part time fishermen, yet the increased effort in fishing has not resulted in increases in fish catches per unit.</p> <p>The pragmatic outlook on the fisheries sector on Zanzibar 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.</p> <p>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.</p> <p>According to de Graff (2014)’s SWIOfish study, mariculture in Zanzibar 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).</p> <p>The fisheries department of Zanzibar now has a dedicated mariculture unit, tasked with supporting expansion of this important yet under developed sector (other than for seaweed farming). 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.</p> <p>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 net cage 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.</p> <p>Troell 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.</p>
<p><b>2. Title:</b></p>	<p>Fish farming research and cage trials on Pemba Island</p>
<p><b>3. Action Reference:</b></p>	<p>Zan-L23</p>
<p><b>4. Justification:</b></p>	<p>The use of destructive fishing gears was ranked as the most severe threat, level 5, for Zanzibar as a whole, with fisheries decline ranked at level 4 for all five regions. The inadequate understanding of fisheries resources was similarly ranked at level 4 for Zanzibar as a whole, with conflicts arising from between local fishers and migrant fishers and between two neighbouring fishing communities over disagreements over gears ranked 4 and 3 respectively. The significance of the threats posed by fishers and by the decline in fisheries production per unit effort cannot be overstated.</p>



	<p>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 been 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 Zanzibar would be ideal for the tourism industry that demands quality fish for restaurants. 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.</p> <p>The western shores of Pemba have 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 area offers the opportunity for feed provision and labour is available. The main elements that are lacking are a hatchery/laboratory, technology and expertise.</p>
<b>5. Objective:</b>	By 2025 at high value farmed seafood from Pemba supplying tourism sector
<b>6. Expected outputs:</b>	<p>In alignment with relevant SWIOfish draft recommendations, the outputs of the action to support fish farming research and cage trials on Pemba are:</p> <ul style="list-style-type: none"> <li>• Study tours for fisheries mariculture unit and IMS aquaculture experts to Mauritius and Singapore completed</li> <li>• New aquaculture candidate species for cage trials identified from local scoping studies</li> <li>• Technology and expertise for cage culture of high value fish developed</li> <li>• Design and construction of hatchery and nursery facilities completed</li> <li>• Feasibility study for Pemba Aquaculture Training Centre completed</li> <li>• Recruitment studies for mangrove crab completed</li> <li>• Local acceptability of tilapia fish farming tested</li> <li>• Tourism industry requirement and timing fully understood</li> <li>• Potential for pearl oyster farming investigated</li> <li>• Cost-effective feeds for small-scale mariculture operations developed</li> <li>• Knowledge of where certain scales of aquaculture operations are suitable (applying ICZM perspectives) gathered and areas identified and zoned.</li> <li>• Local capacity in fish farming developed so as to make meaningful technological contributions.</li> </ul>
<b>7. Activities:</b>	<ol style="list-style-type: none"> <li>a) Project design and appraisal.</li> <li>b) Project tendering</li> </ol> <ol style="list-style-type: none"> <li>1) Research for new aquaculture candidate species identified from local scoping studies</li> <li>2) Study tours to Mauritius and Singapore</li> <li>3) Technology and expertise for cage culture of high value fish are developed</li> <li>4) Feasibility study for Pemba Aquaculture Training Centre completed</li> <li>5) Recruitment studies for mangrove crab completed</li> <li>6) Local acceptability of tilapia fish farming be tested</li> <li>7) Tourism industry requirement and timing is fully understood</li> <li>8) Potential for pearl oyster farming investigated</li> <li>9) Cost-effective feeds for small-scale mariculture operations developed</li> <li>10) Knowledge of where certain scales of aquaculture operations are suitable (applying ICZM perspectives) are identified and zoned.</li> <li>11) Local capacity in fish farming developed so as to make meaningful technological contributions</li> </ol>
<b>8. Assumptions:</b>	The Government of Zanzibar is committed to supporting the improvement of fisheries production, for the benefit of the population of Unguja and Pemba. Local residents and

	businesses are supportive of initiatives to improve their fishing industry and amenable to participating in farmed fish trials and its development.	
<b>9. Risks:</b>	Local fishers and businesses may object and managed to block the project.	
<b>10. Means of implementation:</b>	Logistics, technical, scientific	<ul style="list-style-type: none"> <li>• Budgets for meetings</li> <li>• Budgets for technical assistance</li> <li>• Access to fisheries data/information</li> <li>• Laboratory and hatchling nursery equipment</li> <li>• 10 fish cages (constructed locally or imported ready-made)</li> <li>• Boat hire/purchase</li> <li>• Fish feeds</li> <li>• ...</li> </ul>
	Human Resources	<ul style="list-style-type: none"> <li>• Professional fish hatchery technician</li> <li>• Zanzibar-based aquaculture experts (x4)</li> <li>• Tropical fish farming experts (e.g. from Singapore/Mauritius)</li> <li>• Boatmen</li> <li>• Assistants</li> <li>• Security</li> <li>• Economist</li> </ul>
<b>11. Budget estimate:</b>	<b>Item</b>	<b>Estimate in USD</b>
	Project preparation and mobilisation	100,000
	Project management	200,000
	Study visit to Mauritius and Singapore for six Zanzibar-based aquaculture experts to learn from their experiences at cage culture.	50,000
	Site for laboratory/hatchery and nursery ponds identified and facility designed and constructed	1,050,000
	Research identifying and cultivating potential species suitable for cage culture in Pemba (1 year)	500,000
	Training in hatchery techniques required for cage culture species (2 years)	100,000
	Conducting fish cage trials (x10 cages for 2 years)	100,000
	Feasibility study for Pemba Aquaculture Training Centre	50,000
	Research into recruitment of mangrove crab (2 years)	50,000
	Research into local acceptability of tilapia fish farming activity and consumption of the product	50,000
	Survey of suitability of land/sea areas for tilapia pond farms, fish cage farming, crab fattening enclosures and oyster farming, integrated into the Zanzibar ICZM framework	100,000
	Survey of tourism industry requirements, standards and schedule of seafood needs	50,000
	Research in development of cost-effective feeds for small-scale mariculture operations developed	100,000
	Equipment, supplies, personnel	1,500,000
<b>Total</b>	<b>4,400,000</b>	
	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.	
<b>12. Source of funding:</b>	<ul style="list-style-type: none"> <li>• Government of Zanzibar (budget, participation)</li> <li>• Private Sector (participation)</li> <li>• NGOs (participation)</li> <li>• Development Partners (Technical Assistance budget). AfDB, WB, EU, Bilateral assistance programmes</li> </ul>	

<b>13. Responsible for the action:</b>	<p>Strong Local Government fisheries development stakeholder with expertise in fish farming capable of effectively coordinating efforts:</p> <ul style="list-style-type: none"> <li>• Institute of Marine Sciences (UDSM), Zanzibar</li> <li>• NGOs</li> <li>• Private sector</li> <li>• ..</li> </ul>																																																																																																																																																																																																																																																																																																																																																																																																																																																									
<b>14. Beneficiary from the action:</b>	<p>Local residents (1.4 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.</p> <p>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;</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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<b>16. Links to other actions:</b>	<p>Zan-L17: Zanzibar fisheries sector review by fishery types and management areas  Zan-L19: Zanzibar fisheries MCS programme  Zan-S01: Integrated Coastal Zone Management Framework</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																									
<b>17. Performance indicators:</b>	<p>Increased and sustained fish catch per unit effort; improved quality of fish landed; stabilised fishing effort.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																									
<b>18. Comments:</b>	<p>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.</p> <p>References:</p> <p>de Graaf, G 2013. Rapid Assessment of Fisheries and Aquaculture Information Management System (FIMS) in mainland Tanzania and Zanzibar. First Draft Report. SWIOFish.</p> <p>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</p> <p>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.</p> <p>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</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																									

