GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Naoko Ishii
CEO and Chairperson

July 28, 2014

Dear SCCF Council Member:

UNDP as the Implementing Agency for the project entitled: ***Tunisia: Addressing Climate Change Vulnerabilities and Risks in Vulnerable Coastal Areas of Tunisia***, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the SCCF Council in November 2012 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.TheGEF.org. If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

Naoko Ishii
Chief Executive Officer and Chairperson

Attachment: GEFSEC Project Review Document
Copy to: Country Operational Focal Point, GEF Agencies, STAP, Trustee

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REQUEST FOR CEO ENDORSEMENT
PROJECT TYPE: FULL-SIZED PROJECT
TYPE OF TRUST FUND: SCCF

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PART I: PROJECT INFORMATION

Project Title: Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia			
Country(ies):	Tunisia	GEF Project ID:[1]	5105
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4697
Other Executing Partner(s):	Ministry of Equipment, Land Planning and Sustainable Development, Coastal Protection and Planning Agency (APAL)	Submission Date: Resubmission Date:	April 18, 2014 July 21, 2014
GEF Focal Area (s):	Climate Change	Project Duration(Months)	60
Name of Parent Program (if applicable): ➢ For SFM/REDD+ ☐ ➢ For SGP ☐	n/a	Agency Fee ($):	550,000

A. FOCAL AREA STRATEGY FRAMEWORK[2]

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount ($)	Co financing ($)
CCA-1	**Outcome 1.1** Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas	**Output 1.1.1:** Adaptation measures and necessary budget allocations included in relevant frameworks	SCCF	650,000	11,719,000
CCA-1	**Outcome 1.2:** Reduced vulnerability in development sectors	**Output 1.2.1** Vulnerable physical, natural and social assets strengthened in response to climate change impacts, including variability	SCCF	1,100,000	15,400,000
CCA-2	**Outcome 2.2** Strengthened adaptive capacity to reduce risks to climate induced economic losses	**Output 2.2.2** Targeted population groups covered by adequate risk reduction measures	SCCF	1,500,000	22,800,000
CCA-3	**Outcome 3.1** Successful demonstration, deployment and transfer of relevant adaptation technology in targeted areas	**Output 3.1.1** Relevant adaptation technology transferred to targeted groups	SCCF	2,000,000	23,100,000

[1]Project ID number will be assigned by GEFSEC.
[2] Refer to the Focal Area/LDCF/SCCF Results Framework when completing Table A.

Sub-Total		5,250,000	73,019,000
Project Management Cost	SCCF	250,000	911,000
Total project costs		5,500,000	73,930,000

B. PROJECT FRAMEWORK

Project Objective: To promote innovative adaptation strategies, technologies and financing options to address the additional risks posed by climate change on populations and key socio-economic sectors in Tunisia's most vulnerable coastal areas.

Project Component	Grant type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative co-financing ($)
Enabling policy and institutional frameworks	TA/ INV	1. Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved	1.1 Regulations and enforcement mechanisms governing coastal land use and EIA strengthened to include climate risks management requirements, with a particular focus on siting and construction of infrastructure and tourist facilities (TA: US$ 131,250) 1.2 Advanced coastal risk assessment and adaptation economics tools for planning introduced at 4 planning authorities (APAL national and 2 regional branches, Bureau of Tourism and the regional governments) delivered to 200 key technical staff and decision makers for them to understand and respond to the impacts of climate change induced risks/disasters on coastal infrastructure, economies and livelihoods (TA: US$ 221,850) 1.3 Hardware and software delivered to improve observation capacities, data collection and treatment (topographic and bathymetric surveys, MIKE11 flood and coastal surge modelling software and SEDSIM, Fortran for sediment process modelling) (TA/INV: US$ 140,650) 1.4 In at least 2 vulnerable coastal regions and municipalities (Northern coast of Tunisia and Djerba), spatial plans (Agenda 21, PAU) developed based on impact scenarios, shoreline management planning and cost-benefit analysis of adaptation options (TA: US$ 166,250)	SCCF	660,000	7,410,000

2. Replicable adaptation measures in the target coastal sites	TA/ INV	2. Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 40 km of coast and benefiting 150,000 inhabitants	2.1 Shore protection practices and technologies to mitigate long-term risks from SLR introduced in the region northwest of the Gulf of Tunis and on Djerba island (TA/INV: US$ 2,324,100) 2.2 Improved water management and savings practices for coastal fresh aquifer resources implemented in both project zones to prevent saltwater intrusion resulting from SLR (TA/INV: US$ 325,020) 2.3 Technical capacities, institutional functions and associated budgets in place at the APAL and municipalities including NGOs/CSOs for the maintenance, monitoring and expansion of the introduced shore protection and coastal adaptation practices (TA: US$ 1,101,040) 2.4 Coastal risk monitoring and early warning mechanisms focusing on SLR-induced erosion, urban flooding designed and introduced (TA/INV: US$ 249,840)	SCCF	4,000,000	64,875,000
3. Economic incentives for coastal adaptation	TA	3. Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures	3.1 Investment mechanisms for community based coastal adaptation developed and initiated in both project regions with participation of key tourism operators (Djerba) and farmers (Northwest of Gulf of Tunis) (TA: US$ 248,700) 3.2 Innovative financing instruments introduced and existing funding mechanisms enhanced from national and international sources to support coastal adaptation (TA: US$ 155,700) 3.3 Insurance and property development credits that provide effective risk sharing and risk reduction incentives in coastal built environments designed and introduced amongst 500 highly exposed businesses and households (TA: US$ 185,600)	SCCF	590,000	734,000
Sub-total					5,250,000	73,019,000
Project management cost (PMC)					250,000	911,000
Total project costs					**5,500,000**	**73,930,000**

C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME ($)

Please include letters confirming co financing for the project with this form

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount ($)
National Government	Ministry of Equipment, Land Planning and Sustainable Development / APAL -	Grant	22,700,000
Private Sector	National Coastal Protection Programme TA grants from KFW through Ministry of Equipment, Land Planning and Sustainable Development / APAL	Grant	33,100,000
Private Sector	Saudi Fund for Development through the Ministry of Equipment, Land Planning and Sustainable Development / APAL	Loan	18,000,000
National Government	Green Economy Initiative	Cash	30,000
GEF Agency	UNDP	Cash	100,000
Total Co-financing			**73,930,000**

D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF AGENCY	TYPE OF TRUST FUND	FOCAL AREA	Country name/Global	Project amount (a)	Agency Fee (b)	Total c=a+b
UNDP	SCCF	Climate change	Tunisia	5,500,000	550,000	6,050,000
Total GEF Resources				**5,500,000**	**550,000**	**6,050,000**

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

[2] Indicate fees related to this project.

E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:

Component	Grant Amount ($)	Cofinancing ($)	Project Total ($)
International Consultants	673,000	0	673,000
National/Local Consultants	66,000	0	66,000

F. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? NO

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

PART II: PROJECT JUSTIFICATION

A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF[3]

1. No significant changes were made to the original PIF. All Outputs have been detailed and contextualized to emphasize the needs highlighted during the project preparation phase as noted during workshops and bilateral/multi-lateral consultations.

2. Specific updates to the Outputs include the following:

3. In Component 1,

- Output 1.2: The number and type of planning authorities and the number of key technical staff have been updated in alignment with Stakeholder consultations. Also, the idea of generating a comprehensive coastal adaptation incentive plan and guidance package for the Tourism sector (originally in Component 3) has been moved here.
- Output 1.3: The types of hardware and software have been specified to address observation and modelling needs.
- Output 1.4: Spatial plans will be generated based on risk assessments for both of the project sites in alignment with the existing local Agenda 21 planning mechanism and the Code for Land and Urban Planning (CATU).

4. In Component 2, NGOs/CSOs have also been included as a recipient of training on coastal adaptation practices in Output 2.3 so that they can facilitate the implementation of localised projects. Also, Output 2.4 now specifies that coastal risk monitoring and early warnings will address SLR-induced erosion and urban flooding.

5. The most significant change has been made to Component 3 where an Output has been added to create mechanisms for community based coastal adaptation (replacing the coastal adaptation guidance package idea for the tourism sector Output which has been moved to Output 1.2). Furthermore, the financing instruments to be introduced and funding mechanisms to be enhanced will remain general (i.e., focusing on not only the Fund for the Protection of Tourism Zones) because there are numerous funds which collectively can be capitalised to fund coastal adaptation measures. Finally, Output 3.3 has added the idea of introducing Transferable Development Credits to discourage building activity in risky areas, encourage adoption of climate-proof construction standards, and ultimately, reduce moral hazard across developers and owners. The idea is to create market incentives without the application of taxes to shift development to areas where development is preferred.[4]

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, N
NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

Not Applicable (NA).

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities.

N/A

[3] For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter "NA" after the respective question

[4] Grannis, J. Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use, October 2011.

A.3 the GEF Agency's comparative advantage:

6. GEF Council Paper C.31.5. UNDP was selected as the preferred GEF Implementing Agency by the GoT based on its recognized added-value in most strategic elements of the project, including integrated policy development, capacity building and institutional strengthening, private sector and community mobilization, environmental finance, and decentralized governance. Also, with strong country presence and through its global network of technical staff, in addition to operational expertise in designing/managing other related CEO approved SCCF/LDCF coastal adaptation projects in Africa, Latin America, Asia-Pacific and Arab-States, including the SCCF ''Nile Delta Adaptation'' initiative in Egypt, UNDP is ideally positioned to assist Tunisia to conceptualize and implement this project. Indeed, through its global GEF and non GEF portfolio and learning mechanisms, UNDP will bring in its extensive knowledge in climate change adaptation, climate proof coastal development and ICZM. UNDP also holds an additional advantage by already acting as the main strategic partner of the Ministry of Equipment, Land Planning and Sustainable Development and APAL in supporting several highly relevant initiatives, including the Initial and Second Communications which focused primarily on coastal changes and risks reduction and led to the first ever coastal adaptation project implemented in Tunisia with support from the UNDP Africa Adaptation Programme. This initiative and other positive experiences will provide a solid platform and conducive environment to ensure cost-effective and successful delivery of the proposed project.

7. The UNDP CO in Tunisia possesses very good track records in working on sustainable and integrated coastal zone management and maintains excellent relations and partnerships with the Ministry of Equipment, Land Planning and Sustainable Development and all key stakeholders involved in the project. The CO's Energy & Environment Unit currently manages a programme portfolio with a total value of $8,000,000. It provides adequate staffing and technical capacity to successfully perform all tasks and obligations related to project implementation support. The following staff team will be specifically dedicated to the SCCF financed project: i) Environment Programme Analyst, tasked with continuous oversight of project implementation, including technical support, quality insurance and monitoring & evaluation; ii) Programme Associate, in charge of project management backstopping, e.g. budget planning and revisions, periodic reporting, audits, technical and financial troubleshooting iii) Finance and Procurement Associates, who support financial management tasks, such as budget reviews, delivery reporting, billing, bidding and contracting of service providers; (iv) Resident Representative, responsible for providing strategic leadership and support to the policy reforms advocated by the project.

A.4. The baseline project and the problem that it seeks to address:

8. The government of Tunisia is increasingly realizing the current and emerging risks posed to the coastal zone and has attempted to take action through several different initiatives. For example, as early as 1995, the Coastal Protection and Planning Agency (APAL) was established with responsibility for coastal protection in general and the protection of the Maritime Public Domain. Its mission is to manage coastal areas and to ensure their compliance with rules and standards, to initiate studies and conduct research on coastal change and the evolution of coastal ecosystems. The National Program for the Creation of Marine and Coastal Protected Areas aims at establishing these protected zones along the Tunisian coast. Although several relevant plans and strategies exist to inform effective coastal management (e.g. the Code for the Management of Land and Urban Areas (Law 94-1223; Law 2003-78), (CATU); Regulation on the Maritime Public Domain (Domaine Public Maritime, DPM, Law 95-72 of 24/07/1995); Law 2009-49 on Coastal and Marine Protected Areas) and to provide a platform for adaptation (e.g. National Strategy on Climate Change, 2011; National Coastal Adaptation Strategy, 2011), there is little tangible evidence of any meaningful implementation on the ground. Capacity to deal with the impacts of climate change in coastal zones is inhibited by a lack of appropriate climate-sensitized policies and legislation to enable an integrated approach to coastal management.

9. Furthermore, in spite of the fact that Tunisia is a signatory of the regional protocol for Integrated Coastal Zone Management (ICZM)[5] since 2008, a coherent effort to implement ICZM is lacking. Tunisia's approach to management of negative climate impacts in the coastal zone has generally been reactive and ad hoc with little strategic planning. The focus of efforts with respect to erosion control has been the use of 'hard' techniques to protect adjacent infrastructure and land. Hard techniques are those involving the construction or the implementation of solid works with the core

[5] Protocol on Integrated Coastal Zone Management under the Barcelona Convention of the UNEP MAP

objective of 'holding the line' of the coast and guarding against the evolution of its geometric configuration. For the most part these measures helped to consolidate the line of coast where they are located, but new problems have emerged such as disfigurement of the landscape, accumulation of algae, eutrophication of waters in areas enclosed by breakwaters, uneven redistribution of sediments, aggressive erosion adjacent to longshore protection works etc.

10. Replicability of interventions has also been hindered by a lack of coordinated maintenance and Monitoring and Evaluation (M&E) to profile the effectiveness of strategies employed. The lack of M&E has precluded medium to long term sustainability of the coastal protection interventions implemented to date.

11. Tunisia also lacks the ability to generate/manage climate information in support of climate risk management (CRM) decisions and to bring adaptation technologies and best practices to the most vulnerable areas and stakeholders. Consequently, Tunisia has failed to integrate climate change into key tools for land use and development planning.

12. In short, in spite of the Governments attempts to address existing coastal erosion and create a platform to facilitate future coastal adaptation to the impacts of climate change, there is a need to translate well intentioned 'visions', principles, policies and plans with respect to effective coastal management into a coherent framework for tangible action. In addition, climate change must be comprehensively integrated into such a framework, including within all its associated tools and techniques (including monitoring and evaluation) so that an enabling environment can be created to pilot new and innovative approaches to coastal adaptation and to make these approaches replicable and sustainable.

Equally important is the need for Tunisia to strengthen their capacity to reduce the risk exposure of critical investments (tourism resorts, houses, etc.), to the extent of re-directing them away from vulnerable areas. Adequate financing mechanisms are required to generate and better manage existing and potential funding opportunities to support climate-proof coastal adaptation measures. Without such interventions, difficulties in planning are predicted to continue and worsen (Second National Communication) and the reactive approach to erosion control will continue to the detriment of Tunisia's already highly pressurized and fragile coastal areas.

13. Overall, there are institutional, financial, technological and informational barriers in Tunisia which are required to be addressed to facilitate sustainable coastal adaptation measures. These barriers include the following:

- Existing coastal development planning and regulatory frameworks do not support anticipatory and integrated management of climate change risks
- Limited expertise and knowledge of various risk assessment and decision support tools for adaptation planning, early responses and/or medium-term to long-term risk management
- Limited understanding of a Whole of Systems[6] approach as a means to address current and anticipated climate related risks in the coastal regions
- Inadequate means to mobilise funds for risk-reducing and adaptation activities on public and private levels
- Limited Monitoring and Evaluation (M&E) of coastal protection interventions

14. The Coastal Protection and Planning Agency (APAL) and the General Directorate for Air and Maritime Services and Equipment (DGSAM) are currently self-financing the following coastal protection and coastal livelihood improvement projects which have been put under the umbrella of the ***National Coastal Protection Programme (NCPP)***.

15. The proposed project will enhance the design and implementation of baseline coastal protection measures by building APAL's capacity to consider a Whole of Systems approach for coastal management for medium and long term impacts of climate change as well as vulnerabilities across key sectors (tourism, agriculture, fisheries, water). Ecosystems, natural sedimentation processes and the upstream and downstream watershed hydrology will be considered

[6] The Whole of Systems (WOS) approach can be defined as the integration of multi-disciplinary knowledge and the idea of coastal spaces as a whole, including the complex relations between maritime and terrestrial systems. Through such an approach, changes in coastal geormorphology (i.e., beach and dune systems) are considered along with changes in the surface water and groundwater systems for example. The goal of the WOS approach is to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics so that a sustainable outcome can be achieved.

for the first time in APAL's interventions. SCCF funds will also be used to facilitate the implementation of appropriate soft solutions in other interventions by giving APAL the expertise to exploit existing coastal monitoring data, consider climate change scenarios, generate risk based assessments and recommend appropriate soft protection measures and monitoring schemes. This knowledge will be transferred to other projects at the baseline to adopt such long term resilience building approaches. Natural functions of complex and dynamic, coastal watershed systems will be supported to achieve long term resilience. For example, coastal estuaries and bordering wetlands will be supported to act as a natural buffer, absorbing floodwaters and dissipating storm surges. Similarly, beaches will be reinforced with vegetated coastal dunes and coastal aquifers will be properly managed to reduce saltwater intrusion. Additionally, local plants and native materials will be adopted to offer cost-effective protection measures. Many of the soft protection measures can be constructed, implemented and monitored using local manpower.

16. Specially, SCCF financing will build on the following baseline projects (See Table C above).to address the aforementioned barriers in the following manner:

Table 1: List of baseline projects included in the ***National Coastal Protection Programme (NCPP)***, their locations and how SCCF funds will be used to strengthen their interventions

No.	Baseline project/programme in the *NCPP*	Cofinancing Amount	Type	Location	Strengthening of existing interventions with SCCF funds
1	**Development work in the coastal zone of the Monastir Bay (1st phase)** (funded by APAL, 2014-2015,) – This project involves dredging and deposition of sand in Monastir Bay, beach nourishment and beach consolidation in several sites. It also includes the construction of hard coastal protection measures such as installation of riprap[1], dikes and construction of a concrete drainage canal.	USD 7.9 m	Grant	Monastir Bay (In complementary location, not in pilot areas)	The proposed project will work closely with the self-financed APAL initiative in order to integrate components of coastal adaptation and protection needs into the planned projects. SCCF funds will provide technical capacity to APAL so that the projects can more effectively consider improving the watershed as a whole and take greater consideration of anticipated coastal changes and climate change scenarios such as Sea Level Rise.
3	**Extension and rehabilitation works at the Chebba fishing port** (funded by DGSAM, 2013-2015). This project involves the reconstruction and development of the port. Three piers will be constructed in addition to several docks and a jetty. A rock-filled coastal protection embankment will be built at the wharf and the navigable part of the bay will be extended in order to ensure access by using dredging and rock excavation.	USD 6.4 m	Grant	Chebba fishing port (In complementary location, not in pilot areas)	SCCF financed capacity reinforcement for APAL will enable them to provide climate resilient options for the Chebba port as part of their rehabilitation programme. Specifically, resources will be used to bear expertise on how to integrate coastal developments with natural processes (e.g., runoff flows, sedimentation processes). By rehabilitating natural processes, the capacity of the coastal system to withstand the SLR and other climate change related threats will be enhanced. Capacity building for APAL and DGSAM will enable to look at the project from the watershed perspective. Also, any water recycling measures or uses of Treated Wastewater (TWW) which are documented in the SCCF financed project will be evaluated for use at the port.
4a	***KFW Coastal Protection*** projects, Phase I (funded by KFW, 2013-2017 in Kerkennah Raf Raf) and Phase II (2014-2018 in Sousse Nord /Hergla Rades / Soliman) are being supported by KFW in Tunisia. The main	Phase I: USD 20.5 m, Phase II: USD 10.6 m	Grant	Kerkennah Raf Raf and Sousse Nord /Hergla Rades / Soliman (In complementary location, not in pilot	Although activities by KFW will assist with point erosion protection measures, some 'soft', none of the interventions are considering the watershed as a whole, noting upstream and downstream impacts. The SCCF financed

	objective for both phases is the ecological and economic rehabilitation of the some coastal sites in Tunisia to protect against sea erosion. The four components of the project include 1) enabling access to the sea through ramp construction, 2) achieving watertight protection against seawater intrusion in Elataya, 3) the development of pedestrian and bicycle routes and 4) planting vegetation adapted to the coastal environment. A team of coastal experts is housed within APAL to support the design and construction of techniques to protect the coast from erosion. Phase I and Phase II plan to perform point coastal protection measures. Specifically, in Kerkennah, landscaping will be done in a few locations behind seawalls to help prevent marine erosion. In El Attaya, the project proposes to use hard construction measures, namely seawalls to prevent against seawater intrusion. The two alternatives for seawalls currently being studied include a dam with a concrete core and a dam with a clay core.			areas)	interventions will add such experience by building the capacity of APAL to make the KFW interventions more sustainable and climate resilient in the long-term. SCCF investment will support groundwater management decisions so that salt water intrusion can be reduced. Similarly, SCCF resources will help in introducing the most appropriate native grasses to reduce marine erosion.
4b	***APAL (Tunisia) contribution to the KFW Coastal Protection Projects: Phase I + Phase II, above***	USD 10.4 m	Grant	Kerkennah Raf Raf and Sousse Nord /Hergla Rades / Soliman (In complementary location, not in pilot areas)	See above
	SUBTOTAL (non-loan projects included in APAL's National Coastal Protection Programme	USD55.8m			
7	***Coastal Protection from Carthage to Gammarth Programme*** (funded by the Saudi Fund for Development (loan), 2013-2015): This project focuses on implementing hard coastal protection measures along the Tunisian coast from Carthage to Gammarth to protect against the adverse impacts of	USD 18 m (loan)	Grant	Along coast from Catharge to Gammarth, not in pilot areas	Although the project from Carthage to Gammarth is a significant example of coastal protection, without the SCCF support, this project will fall short of the long term vision of coastal adaptation which requires more flexible and cost-effective "soft" alternatives that allow for greater resilience of the coast as well as

	sediment transport and erosion. It aims to protect economic and social infrastructure, such as houses, hotels, service networks and roads by using beach nourishment on a stretch of 30-50 m and by installing riprap on infrastructure for protection against sea erosion and storm surges. Indirectly, the project aims to protect coastal forests and agricultural terraces which have increasing groundwater salinity levels. Presently, affected populations are moving away from these regions without any other options.				consideration of water management practices on the watershed level. SCCF funds will be used to build the technical capacities within APAL to integrate a watershed perspective including ecosystem-focused approach to coastal protection plans from Carthage to Gammarth. More soft solutions will be implemented from Carthage to Gammarth as a result.

17. This project will also build off on-going water and green economy projects, programmes and initiatives which are planned or have demonstrated success on the ground.

- The Global Water Partnership (GWP)[7] is active in implementing the ***Water Climate and Development Program for Africa*** (WACDEP, 2014-2016, 9.2 m USD) in Tunisia. WACDEP aims to (a) integrate water security and climate resilience in development planning, (b) develop partnerships and capacities to build resilience to climate change through better water management, and (c) develop 'no regret' financing and investment strategies for water security and climate change adaptation. The SCCF financed project will complement the WACDEP initiative by focusing on building climate resilience in the specific field of coastal management. The SCCF financed project will support the demonstration project and other GWP initiatives by detailing and piloting best water management practices. Also, the GWP projects will be able to leverage updated regulatory frameworks (local Agenda 21 and CATU) which will be supported by SCCF funds to consider predicted coastal climate change impacts, most notably sea level rise. (Note that cofinancing from GWP was not possible because their initiative, Integration of climatic variability and change into national strategies to implement the ICZM protocol in the Mediterranean, is financed by the GEF.)

- The National Adaptation Plan Global Support Programme (NAP-GSP) has partnered with the Global Water Partnership (GWP), in collaboration with United Nations Development Programme (UNDP), the Centre for Environmental Economics and Policy Analysis in Africa (CEEPA- University of Pretoria) and other partners, to provide support for Tunisia to integrate the economics of adaptation in the context of water security and climate resilient development. Under this cooperative umbrella, the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** initiative (2013-2014, to be led by UNDP) will reinforce the planning capacity of national institutions in Tunisia to perform sound economic analysis of adaptation. The initiative will help build the capacity of planners and technical officers to identify, develop and appraise no/low regrets investment options and integrate these into planning processes, programmes and plans. This initiative will contribute to enhanced understanding of the economics of adaptation as it relates to medium- and long-term regional, trans-boundary, national, sub-national and sectoral development planning as well as in evaluating different adaptation investment projects. Five regional level training workshops are planned to support key economists and sector representatives from Tunisia with how to evaluate the costs and benefits of adaptation and link with the NAPs process.[8] In parallel, nationally-based economists and planners will be trained on technical aspects of data analysis in 40 national workshops. Training workshops will be followed by on-the-job training and in-country field activities to assess the costs and benefits of climate change adaptation. The SCCF financed project will build on the training on the economics of adaptation by exploiting this knowledge to make best ICZM decisions. At the same time, SCCF funds will be used to implicate the tourism and agricultural sectors in the two project zones so that they can provide input and support feasible and cost-effective coastal planning and decision-making by considering environmental and socio-economic benefits. (Note that financing for the ***Economics of Adaptation, Water Security and Climate Resilient Development*** programme is limited in quantity, so it was not considered a significant source of cofinancing.)

- The ***Green Economy Initiative (GEI)*** aims to streamline the efficient use of natural resources, to contribute to the promotion of green employment and renewable energies, to promote low-carbon development and to support the development of eco-technologies to the National Strategy for the Green Economy (2016-2036) is focused on these aims with plans to i) provide a higher share of green sectors contributing to GDP, ii) boost green jobs, iii) lower energy and resource intensive production, and iv) reduce levels of poverty. Some of the principle sectors supported by the GEI relevant to the SCCF financed project include the re-use of water, durable construction and support for green industry. In spite of the Strategy and limited applications, the GEI is lacking new strategic sectors of green growth based on the use and exploitation of innovative technologies and the formation of public -private partnerships including the civil society. Also, the GEI is lacking ways to identify financing mechanisms, including taxes, to support the realization of its diverse National Strategy. The proposed project plans to support the GEI by identifying ways to capitalize existing funds. It will also support the GEI's objective of water re-use by developing

[7] www.gwp.org

[8] North-South and South-South knowledge exchange will be promoted through involvement of international organizations and academia such as NIRAS of Sweden, Yale School of Forestry and Environmental Studies (F&ES) of the USA, FEEM based in Venice, and the Centre of Environmental Economics and Policy in Africa (CEEPA) in South Africa.

targeted water management plans for the agricultural sectors in the two project zones. Most significantly, the proposed project will work with the GEI to create a green employment and potentially a green industry by exploring an innovative way to use locally sourced grasses for sand stabilisation (See Component 3).

18. These programmes in combination provide a unique opportunity to address coastal adaptation priorities in the country. However, despite growing commitment and on-going efforts, the baseline projects as described above fall short alone of achieving the long-term solution of integrated coastal adaptation. This is largely due to the fact that up until now, there has been no integrated approach to coastal protection which treats the coast as a whole (as opposed to dealing with site specific impacts under current conditions).

A. 5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

19. Outcome 1: **Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved**

Without SCCF Intervention (baseline) Outcome 1:

20. Over the past 15 years, the Government of Tunisia (GoT) has been increasingly realizing the high vulnerability of the coast and has taken significant actions to improve its ability to manage and protect its coastal zones. In 1995 (Law 95-72), the GoT created the Coastal Protection and Planning Agency (APAL), with the aim of achieving sustainable development of the coast by preserving its natural environment and ensuring its integrated management. The mandate of APAL covers protection of sensitive ecosystems, licensing and control over development activities within the maritime public domain (including temporary occupations and concessions), design and implementation of coastal protection interventions, assistance with EIAs, development planning of tourism beaches, management of the National Shoreline Observatory and environmental monitoring and research. It is a financially autonomous non-administrative public entity (EPNA), placed under the Ministry in charge of Environment and made up of one central agency, ten decentralized offices and over 150 administrative and technical staff. Its annual operating budget revolves around US$ 16 million (2013).

21. APAL fulfils an important institutional role for coastal management. However, the agency still faces important capacity gaps that limit its ability to address increasing threats from climate change on coastal development. First and foremost, mechanisms for planning and coastal development do not use a collaborative and integrated approach and consider potential climate change impacts (e.g., sea level rise). Moreover, the existing structure of and coordination between ministries and departments does not promote free-flow of data as well as relevant information for effective, systematic decision making. For example, the existing Environmental Impact Assessment (EIA) process led by the National Agency for the Protection of the Environment does not consider available coastal vulnerability mappings which have been generated by APAL through the AAP project (AAP project See Section A.7). An inability to coordinate resources has occurred as a result of lack of funds and a lack of awareness on the activities of parallel ministries.

22. In addition, the existing regulatory framework lacks appropriate policies, strategies, legislative or executive mandates for Climate Change Adaptation in the coastal zone. Regulations and codes governing coastal land and infrastructure development (e.g. Code on Land and Urban Development) are dated back several years or decades and do not account for SLR and associated climate change risks. According to the 2010 National Climate Change Adaptation Strategy for the Tourism Sector, planning regulations require reviewing and strengthening to support the Tourism sector to build resilience to Climate Change. The Strategy recommends that Maritime Public Domain retreat regulations be strictly enforced.

23. Key baseline regulations and planning codes which prohibit the consideration of climate change in accordance with the 2010 National Climate Change Adaptation Strategy for the Tourism Sector and the implication of APAL's scientific findings include:

- The Maritime Public Domain (Domaine Public Maritime, DPM) which refers to the fringe of coastal land that may be used by anyone without restriction. At present, the DPM does not consider sea level rise (SLR) to any extent in spite of conclusions from past studies which have clearly demonstrated its impacts along the Tunisian coast. A study by the Ministry in charge of the Environment and Land Development[9] (YEAR), aimed to try to understand the changes that may result from seal level rise (SLR) and their impact on the DPM. This study was based on a projected 0.55cm rise in average sea level over the coming century. The study concluded that the DPM must be extended inland to account for necessary conservation and protection of vulnerable coastal areas as well as to account for risks of erosion and coastal flooding. While important, the recommendations in the DPM study are based on projections for sea level rise that came out of a study conducted by the Ministry of Environment and Equipment (2001). As such, they should be updated to reflect the recent state-of-the-art with respect to climate science. For example, the latest scientific outputs from the fifth assessment report of the IPCC (Summary for Policy Makers, AR5[10]) present a worst case scenario of 0.98m SLR by 2100. The appropriateness of an elevated SLR figure[11] should be considered further in studies to inform the incorporation of SLR in the DPM to ensure robust climate proofed decision making in the coastal zone.

- Similarly, the Code on Land and Urban Development (CATU) does not include a consideration of climate change. This Code regulates the organization and operation of spatial planning, creation and development of urban areas, rational use of resources and protection of natural and cultural sites. It is therefore intended to assure coherence between different development programs in terms of infrastructure and procedures for environmental protection. For instance, the CATU is used to weigh urban expansion against the needs to protect natural sites and sustain agricultural activities. It adopts both a social and economic perspective to planning, identifying vulnerable zones as per technical advice provided by the Ministries in charge of Land and Urban Development, Environment, Regional Development and Agriculture. CATU states that it "considers natural risks and impacts on the environment." However, it does not specify climate change or any specific risks associated with climate change on the coast. In fact, any development on the coastal zone is restricted to the guidance of the law on DPM.

- Each region of Tunisia also has a Local Agenda 21 which is a sustainable development plan informed by significant Stakeholder consultation. By taking an overview of the region and considering environmental, social and economic resources and constraints, the Agenda prioritizes needs, arranging them on a schedule and chooses the most equitable development plan based on indicators. Although each Local Agenda 21 is site specific, it does not consider the impacts and costs of climate change as well as future scenarios of coastal CC impacts.

- Furthermore, Tunisia's Environmental Impact Assessment regulation, Law 115 of 30/11/1992 and Law 2001-14 of 30/01/2001 and Decree No: 91-362 does not consider coastal vulnerability in its development decisions. Erosion impacts and the effects of Sea Level Rise are not considered in coastal development projects because there is no vulnerability categorization based on scientific analyses embedded within the EIA which can be used to facilitate EIA decision-making. This is in spite of the vulnerability ratings created by APAL during the AAP project. According to Stakeholder discussions, APAL and the National Agency for Environmental Protection (ANPE), which is responsible for EIA decisions, have not had the opportunity or mandate to formalize zoning of coastal projects according to quantified risk.

24. APAL also lacks the proper tools, software and institutional processes to inform key institutions and local authorities of coastal risks and influence key coastal management policy decisions in vulnerable sectors such as tourism

[9] Formerly known as the Ministry in charge of the Environment and Development Planning (MEAT), Study on the delimitation of the Maritime Public Domain by considering accelerated Sea Level Rise projections in Tunisia (2007)

[10] IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

[11] Please note it is not explicitly recommended here that 0.98m be adopted by the DPM study. Rather, the relevance of recent projections for SLR for application in regional studies should be considered, in particular with the publication of further Working Group Reports into 2014.

and urban development. Both APAL's Shoreline Observatory and National Observatory for Environment and Sustainable Development (OTEDD) accumulate a growing knowledge and information base on coastal processes and changes, however, this information is not targeted to address climate change risks to coastal zone nor is it made available to other institutions in a way that can support effective adaptation decision-making. During the past three years APAL received strategic support from the UNDP in the framework of African Adaptation Programme (AAP) funded by the government of Japan and UNDP. The project helped update coastal topographic profile by a comprehensive geomorphological and coastal sedimentation studies to assist in predicting morphological changes in the coastline over time. However, the AAP risk mapping was too general to provide required specific geo-physical inputs required to serve coastal planning for the two target zones. Consequently, this information is not zone specific to enable a meaningful SLR and inundation risk prediction/mapping for the purposes of designing and implementing targeted coastal adaptation measures.

25. In order to strengthen the capacity of coastal observatory in collecting quality marine data and new kind of data (physicochemical, hydrodynamic, oceanographic and Metrologic), the AAP and PEE (« *Programme Environnement et Energie* » funded by EU) projects provided 3 fixed water wings and 4 small floating water wings. These water wings were placed in the Gulf of Tunis, Golf of Hammamet and Gulf of Gabès. Also, through the AAP project 4 numerical tide-gauges were bought and placed in the ports of Goulette, Marina Hammamet, Sousse and Gabès. Currently, APAL lacks topo-bathymetric profiles to complement this data.

26. A number of tools are currently used in-country to assist the planning process. According to the CATU code (described above), each urban region must have an Urban Development Plan (PAU, Planning d'Amenegemnt et d'Urbanism). Within the plan, an analysis of the effects of implementation of the development plan on the physical and environmental characteristics of the site concerned and the measures to be taken for their protection and development must be outlined. The plan must also provide justification for the urban development options with the guidance of the master development and legislation related to public easements (e.g., DPM). However, neither the local Agenda 21 nor the PAU mandates the consideration of climate change and its associated costs. They also do not consider future scenarios relative to CC impacts.

27. While the aforementioned tools provide an important start point for a prioritised, integrated approach to environmental planning (despite their omission of climate change considerations) they lack a coherent mechanism to deliver holistic, systems based coastal management. ICZM is the accepted vehicle through which this is delivered both internationally and within the Mediterranean region under the auspices of the Mediterranean Action Plan. The Government of Tunisia recognises the important role that ICZM plays in sustainable development and considers ICZM a high priority. They became a signatory to the ICZM Protocol under the Barcelona Convention in 2008. Despite this commitment to an integrated approach to management in the coastal zone, Stakeholder consultations and baseline research has indicated that little tangible progress has been made with respect to a coherent programme of work for ICZM on the ground. Numerous donor-driven demonstration projects have been undertaken in-country, the majority of which have been affiliated with the RAC/PAP of the MAP and have focused on case studies in several coastal areas. Past initiatives have included SMAP, MEDTAP, MEDWET) and ongoing work is being undertaken primarily through the MedPartnership. While many project outputs and outcomes have been useful at a site-specific and local level, there is limited evidence of attempts to upscale this progress at a regional level or to complement it with a institutional effort to mainstream ICZM within the core business of those responsible for management of the coastal zone. For example, the expressed objective of SMAP III in Tunisia was 'The elaboration a participatory and concerted ICZM plans of action for the region of Grand Sfax to be used as a model for the development of a national integrated coastal management plan'. While the Project produced comprehensive and participated ICZM plans of action, specifically tailored to the needs and potentials of the coastal area concerned, it is unclear how (if at all) the Government of Tunisia used these outputs and outcomes to leverage a platform for ICZM at a national level.

28. Overall, it appears that any attempts to implement ICZM to date have occurred in an ad-hoc manner within different agencies or organizations and little coordination and awareness between the projects/programmes exists. For example, the MedPartnership project (implemented by ANPE) is trying to assist countries in the implementation of the Integrated Coastal Zone Management ICZM Protocol and to support the sustainability of activities through the Barcelona Convention and MAP systems. The MedPartnership is also supporting an ICZM pilot site where they are focusing on preserving ecosystems in the Kerkennah coastal region. However, APAL is not implicated in this critical ICZM project. Furthermore, the MedPartnership also has a regional component to create a data exchange platform for existing data. Stakeholder consultations indicated the MedPartnership is not coordinating with the existing Information

System for Decision Aid housed at APAL. Similarly, the Global Water Partnership is helping 12 countries including Tunisia to develop Coastal Zone Management Plans under the management toolkit of Integrated Coastal Area and River Basin Management (ICARM). Although APAL is aware of the project, Stakeholder consultations indicated that APAL is not actively implicated in the project.

29. To date, APAL has not carried out any in-depth study of vulnerable areas considering upstream watershed processes, community priority ranking for areas most at risk and scenarios of CC impacts according to the most recent UNFCCC projections. Overall, thus far, APAL and other key planning authorities, such as the General Directorate for Land-use Planning (DGAT) and the National Environmental Protection Agency (ANPE) have made very little use of adaptation planning methods that could help them idenfity the risks on major coastal investment portfolios and examine costs and trade-offs of different risk management options, such as alternative sitting of tourim structures and strategic retreat vs. protection. This is exacerbated by the fact that APAL currently has limited experience working cross-sectorally, such as with cost benefit analysis for planning. Furthermore, existing monitoring and forecasting functions within APAL and its partner agencies are limited in scope and lack the robustness to convey relevant inputs to policy makers and tourism developers in a timely manner (e.g, to influence the National Tourism Office (ONTT) and the Tourism Estate Agency (AFT) public-private investment plans).

30. This situation is particularly problematic in the tourism sector which has set an ambitious development target of 7.7 million visitors by end of 2016 by expanding services to Eastern Europe, China, the USA and neighbouring countries. To achieve this, the National Tourism Office (ONTT) and the Tourism Real Estate Agency (AFT) have put together under the 11th Five-Year Plan a public-private investment programme that aims to develop 15 new tourism resorts (hotels, marinas, ports, etc.), including the Lalla Hadria project in Djerba.[12]

31. Without SCCF intervention, the technical capacities and skill-sets of APAL and associated organisations (National Observatory) to efficiently conduct, interpret and integrate coastal modelling, climate risk assessment and adaptive measures into shore protection and land-use and decisions is likely to remain limited. Coastal managers in-country lack appropriate tools and techniques to enable effective adaptation decision making, in particular an understanding of climate risk and an appreciation of the economics of adaptation in their coastal zones. They have an understanding of vulnerability as a result of the Africa Adaptation Project outputs (as well as due to other Baseline projects, see Section A.4), however, their understanding needs to be translated into evidence-based assessments of coastal impacts and consequences as well as likelihood of impacts through time. This understanding is necessary if APAL wishes to effectively adopt an 'adaptive pathways' approach to managing the coastal zone in a timed prioritized manner while integrating considerations of climate change. In conjuction, in the absence of more evidence-based, climate-sensitive and stringent regulations for building setbacks, hazards zoning, construction standards or EIA, the vulnerabilty and exposure of on-going and planned development investments (especialy in the residential and tourism sectors) will continue to increase, potentially leading to a steep trend in human and economic losses from coastal disasters.

With SCCF Intervention (adaptation alternative) Outcome 1:

32. It is internationally accepted that ICZM can provide an important framework for coastal adaptation bringing together the various local, regional and national stakeholders in improving land use decisions and coastal management practices. Good climate change adaptation within a coastal context is essentially 'good' Integrated Coastal Zone Management (ICZM) with a climate change lens. Although the specifics of implementation of this integrated process may vary from place to place dependent on their unique circumstances, three elements are considered key, namely:

- Appropriate direction-setting guidance;
- Adequate institutional arrangements; and
- Comprehensive coastal management planning

[12] The Lella Hadria project is contentious and has not been fully approved. Originally, hotels with an overall maximum capacity of 6,500 beds, a golf course and marina were planned. However, because this site is one of the few naturally preserved areas on Djerba island, ANPE has not permitted the construction of the golf course and marina.

33. SCCF financing will support development of these three key elements to cascade from strategic levels through to those that guide specific operational activities. Nested within this integrated process will be the demonstration of innovative approaches to adaptation which may ultimately be up-scaled and implemented as part of an ongoing programme for sustainable coastal management around the country. The project plans to use SCCF funds so that Tunisia can leverage the Integrated Coastal Zone Management (ICZM) approach given its successful role in climate change adaptation endeavors elsewhere and the fact that Tunisia is a signatory to the ICZM protocol under the Barcelona Convention.

34. A key part of supporting ICZM is to reinforce the technical and human capacities within APAL and its partner agencies (DGAT, ANPE, ONTT, OTEDD, AFT and local authorities) to help them better assess and address emerging and anticipated climate change risks on the Tunisian coast. In order to strengthen institutional capacities to conduct ICZM at the local, regional and national levels, the project will support the creation of a national ICZM inter-ministerial platform which will enable coastal projects to be coordinated and resources to be wisely used. The ICZM platform will facilitate decision making on sustainable coastal development balancing decisions with the potential socio-economic benefits of developments. An important role of this platform will be the establishment of collaborative partnerships with the ongoing, donor driven ICZM relevant initiatives in the region (see Global Water Partnership discussion, Section A.4). Specifically, the project will build off the significant work undertaken through the UNEP PAP/RAC in providing advice to MAP countries to integrate climate change within the ICZM protocol through the MedPartnership project (implemented by ANPE).

35. With SCCF funds, all relevant frameworks will also be updated to enable the consideration of future SLR scenarios based on an interpretation of the recently released fifth assessment report of the IPCC. The most up-to-date information available will be used to estimate direct impacts on the DPM and development plans including expected loss of beaches and infrastructure in conjunction with expected socio- economic impacts. A particular emphasis will be put on the improvement of coastal development setback distance, rules and local enforcement capacities so as to more effectively accommodate future changes in shoreline and reduce potential risks on human safety and the built environment. As such, APAL will become more appropriately mandated to protect and sustainably manage development as well as to guide public and private sector investments towards low environmental impact and climate compatible options. Similarly, EIA procedures will be updated to find the best development solution weighing climate risk, environmental, social and economic criteria. It is an opportune time for the proposed project to influence development decision-making because Tunisia is creating a new Environment Code. Through the first component, APAL will gain the expertise to create a spatial delineation of risk (low, medium and high risk zones) which can feed zoning strategies to facilitate EIA decision-making. The risk assessments will also be used in the development of the Environment Code which will act as an over-arching piece of legislation that will have the power to impact development (or the lack thereof).

36. Moreover, the appropriate hardware and software (Output 1.3) for flood modelling (MIKE11) and sediment physical process modelling (SEDSIM and Fortran) will be purchased to have more relevant, site-specific data to support risk assessments. This data will be integrated into the existing Information System for Decision Aid, housed at APAL which will provide better inter-agency data exchange with the development of a databank dedicated to knowledge transfer. With data collection supported by SCCF funds, regular updates in hazard and inundation risk maps will be made to reflect the changing risks of flooding.

37. To support effective decision making based on ICZM in the specific project zones, one risk-based spatial management plan detailing prioritized, cost effective adaptation strategies / flexible pathways will be developed for each of the designated target areas (The island of Djerba in the southeast and the northwest coast of the Gulf of Tunis, See Maps Figure 1 and Annex 3). In order to develop these plans, coastal hazard mapping for the target zones will initially be undertaken. The intended mapping will be used specifically for economic assessment of adaptation options, and will provide a fit-for-purpose product as well as forming the basis for more strategic adaptation planning within the target areas. The AAP project has identified the target areas as potentially subject to erosion and coastal inundation due to climate change. Key characteristics of this work have been the formulation of vulnerability maps that show relative susceptibility to sea level rise, rather than a time-varying projected shoreline position required to inform robust adaptive decision making. A natural extension to the existing coastal vulnerability studies is their application to coastal risk studies, in such a way as to facilitate decision-making with respect to climate change adaptation.

38. SCCF resources will be used to conduct a 'second pass' assessment for both the target areas (East coast of Djerba and Northwest of the Gulf of Tunis) to refine the choice of coastal risk assessments to be conducted and confirm the cost-effectiveness of adaptation plans. The choices will take into account adaptation economics principles and use different techniques in cost-benefit analyses including a "real options' assessment method[13] to help planners better understand how the outcomes of integrated coastal management (based on data from geomorphology, hydrology, ecology, population dynamics and economics, etc.) for a potential new coastal management "alternative," (e.g., hard (breakwaters) or soft (dune fixation) coastal adaptation measures) might vary across climate change scenarios (For more detail, see Annex 3). In doing so, results from these assessment methods will provide the appropriate timing and prioritization of adaptation investments.

39. The site-specific analyses of climate risks and adaptation will provide a view to guiding the adjustment of local shoreline management policies, long-lived infrastructure projects (e.g. dikes), spatial and land use plans (*Schéma Directeur d'Aménagement Regional; Plan d'Aménagement Urbain*) as well as disaster risk reduction strategies (e.g. flood plans). The expected outputs include the identification of the most effective adaptation options (including protection, accommodation and managed retreat) and technical solutions to strategically managing coastal processes and hazards (e.g. flood and erosion) in the short and long term.

40. All land use development decisions will be based on careful analysis of costs and benefits under a range of impact scenarios. Socio-economic assessments will help demonstrate the cost-effectiveness of certain adaptation measures, such as dune stabilization, groundwater conservation, wetland restoration, or using vulnerable lands as natural preserves or for low value uses, as opposed to solely ''hard'' structural responses. The project plans to work with other regional programmes (the MedPartnership and the Global Water Partnership) to reinforce national capacities to perform economics of adaptation analysis. With this capacity, national focal points will have the ability to detail long-term options across sectors (both public and private) which can be used for coastal adaptation to manage the inherent uncertainties of climate change.

41. The final output of Component 1 will be the development of a guidance package for local authorities including the tourism (Djerba) and agricultural (Northwest Gulf of Tunis) sectors on coastal risk mitigation options. All coastal risk mitigation options will be based on the management plans and economic analyses generated throughout the project. The package will include a series of evidence-based recommendations for the tourism sector to ensure flood and erosion protection of the physical infrastructure in compliance with spatial plan and coastal zoning regulations. To facilitate the implementation of coastal risk measures, targeted awareness building will be used to effectively communicate the options so that they can be easily understood.

42. Specifically. SCCF funds will build on the above mentioned baseline projects (See Section A.4) in the following manner:

- Build on the ***MedPartnership***'s experience in data sharing and on the MedPartnership's training for specific coastal software for assessing impacts (DIVA). It will furthermore, use lessons learned on the development of an integrated management plan for another coastal pilot site.
- Build on the training workshops, on-the-job training and in-country field activities from the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** project (2013-2014) to assess the costs and benefits of climate change adaptation. Both the proposed and ***Economics of Adaptation*** projects will work together to provide joint training sessions to reinforce national capacities to evaluate different adaptation investment options.

43. The SCCF financed project will also build on relevant projects in the following manner:

- Integrate the lessons learned on climate change related coastal monitoring from the ***IASON*** project when procuring and placing new data collection equipment.

[13] The Real Options assessment method to be introduced, in the climate change context, will provide an evaluation of possible futures so that investment decisions to implement adaptation measures can be timed and weighted. Through this method and linking with CC scenarios, it will be determined whether it is worthwhile to implement part of an adaptation measure which can be upgraded to a higher level in the future or to avoid implementation of a cost-intensive protective measure if the climate risk is not expected to change significantly.

- Build on the ***Tunisian-Bavarian Cooperation*** and their monitoring studies of lagoon ecosystems, particularly their study of the algae problem along the beaches of Djerba. The SCCF financed project will use this ecosystem information when developing site-specific ICZM plans.
- Coordinate with the ***Arab Climate Resilience Initiative (ACRI)*** to build on the capacity building they will provide to identify and assess the most vulnerable groups to coastal erosion. Information on vulnerable groups will be an integral component of coastal management plans because the foundation of ICZM is to ensure Stakeholder input is collected on perceived risks. Furthermore, SCCF funds will be used to build on the knowledge gained through ACRI on how to establish appropriate monitoring schemes for SLR and land subsidence.
- Build on the support for ocean monitoring, Decision System Support (the SIAD) and equipment calibration and maintenance provided by the ***Environment Energy Programme*** of the Union European

Outcome 2: Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering covering 22 km of coast and 670 hectares of wetland and benefiting 150,000 inhabitants

Without SCCF Intervention (baseline) Outcome 2:

Shore protection to mitigate long-term risks from SLR.

44. Coastal hazards resulting from SLR and climate change, such as increasing erosion, water stress or extreme storm surges and floods, are priority concerns for the GoT and have prompted a number of critical national and international baseline investments. For example, the Coastal Protection Programme, Phase I (15 m EUR, 2013-2017, Kerkennah Raf Raf) and Phase II (7.9 m EUR, 2014-2018, Sousse Nord /Hergla Rades /Soliman) are being supported by KFW in Tunisia. The main objective for both phases is the ecological and economic rehabilitation of coastal sites in Tunisia to protect against sea erosion. The four components of the project include 1) enabling access to the sea through ramp construction, 2) Achieving watertight protection against seawater intrusion in Elataya, 3) the development of pedestrian and bicycle routes and 4) planting vegetation adapted to the coastal environment. A team of coastal experts is housed within APAL to support the design and construction of techniques to protect the coast from erosion. The projects plan to perform point coastal protection measures. For instance, in Kerkennah, landscaping will be done in a few places behind seawalls to help prevent marine erosion. Also, the project proposes to use hard construction measures, namely seawalls to prevent against seawater intrusion in El Attaya. The two alternatives currently being studied include a dam with a concrete core and a dam with a clay core.

45. APALs current programme of work also includes several site specific coastal projection projects, such as that for the area from Catharge to Gammarth which focuses on implementing hard coastal protection measures (Saudi Fund for Development (loan), 2013-2015, 13 m EUR) and development work in the coastal zone of the Monastir Bay (1st phase) (funded by APAL, 2014-2015, 10m TND) – This project involves sand nourishment in several sites. It also includes the construction of hard coastal protection measures such as dikes and canals. Overall, APALs Programme of Coastal Protection against sea erosion pertains to approximately 100 km of the Tunisian coast.

46. Despite a commitment to climate resilient works and a growing willingness to use ‘innovative’ approaches, the existing and baseline projects will fall short of achieving the long-term solution of coastal adaptation without SCCF intervention. This is largely due to the fact that there is no integrated approach that retains ecosystems services at its core and includes a systematic programme of works to treat the coastal area as a whole (a Whole of Systems approach, as opposed to dealing with site specific impacts under current conditions). It is clear that the project portfolio to build coastal resilience largely entails the use of coastal erosion control measures to treat existing issues rather than a coordinated effort to reduce coastal risk into the future with the unequivocal influence of sea level rise. The only project in the current baseline portfolio that deals with soft protection measures is the work being co-funded by KFW. However, this work tackles a site specific issue while helping prevent marine erosion in a few locations behind existing coastal seawalls. This effort is largely targeted at one predetermined location and does not consider the watershed as a whole, noting upstream and downstream impacts on the hydrology of the catchment. .

47. Previous bad experiences with hard coastal protection measures have been well documented (e.g. disfigurement of the landscape, accumulation of algae, eutrophication of waters in areas enclosed by breakwaters, uneven redistribution of sediments, aggressive erosion adjacent to longshore protection works etc). On the basis of this information, APAL began to investigate the possibility of using new flexible methods for coastal erosion projection as early as the late 1990s. Despite the early undertaking to find 'a better way' to protect the coast, diversified experiences with innovative techniques in-country remain relatively limited and have focused on the isolated application of wooden palisades as a means of stabilising the upper beach, replenishment of the beach with additional sediment and stabilisation efforts using sand filled geotubes (See Annex 3, Prefeasilbity Study, Soft Measures Implemented). The key issue in applying these 'new' techniques has been inherited from the previous 'hard' engineering regime. Namely, implementation has occurred in relative isolation without a supporting framework or programme for management and with no recognition of the interconnectedness of the wider coastal system. As a result, while they may provide a measure of short term gain (in terms of volume of sediment along a particular area of the coast) they have not contributed to the long term resilience of the coastal zone in a meaningful way.

48. Ganivelles (wooden palisades) employed at the Radisson at Ras Errmal spit in Jerba as part of the recent AAP project provide a good example of this situation. The ganivelles are a potentially useful way of causing reduced wind erosion, thereby enabling a steepening of the beach, which means less landward transport and hence a 'wider' beach for the same volume of sediment. However, they will not be effective in the long term at this site due to inappropriate spacing and fencing heights being used.[14] The palisades as part of the AAP project were not subject to any ongoing maintenance or coordinated monitoring and evaluation. Based on anecdotal evidence from field visits through the project preparation phase it seems that ad hoc photo monitoring of the area is occurring, but this information is not being collated in a systematic manner or evaluated to inform the decision making processes with respect to local coastal management.

49. Overall, with most coastal protection interventions, success has been limited and replicability of interventions is hindered by a lack of coordinated maintenance and Monitoring and Evaluation (M&E) to profile the effectiveness of strategies employed. The lack of integration within an overall management framework mean that interventions have no medium to long term sustainability and are more often than not short term solutions for current issues at an isolated 'point' along the coast. Measures implemented may appear to have achieved success in the short term (e.g. halting erosion of immediately adjacent coastal land) but their long term contribution to resilience building is unsubstantiated at best and counterproductive at worst.

50. In summary, while the baseline efforts with respect to shoreline protection in-country appear encouraging and helpful, they are unlikely to be sufficient to deal effectively with the magnitude and specificity of the climate change threats in coastal areas. In absence of SCCF support, there will be limited applications of cost-effective and proven practices to increase coastal resilience in the medium to long-term. As such, despite the early steps made to introduce more resilient and soft defense approaches such as beach nourishment, the APAL's coastal protection programme would continue to be dominated by costly and short-sighted hard engineering solutions.

Technical capacities, institutional functions and associated budgets in place at the APAL

51. Furthermore, there are important capacity gaps for APAL both in terms of designing and implementing appropriate climate-resilient erosion control methods. For example, the technical studies underpinning the design of the APAL's protection and beach nourishment solutions were conducted before the completion of the SNC V&A analyses and do not sufficiently take into account the latest scientific understanding of sea level rise and changes in local hydro-sedimentary conditions. As a result, a critical part of the investments planned could be lost or rendered inefficient in the near future. At the same time, the programme is focusing almost exclusively on one type of strategy (mix of infrastructural and beach nourishment techniques) and does not consider a more diversified portfolio of new, flexible and 'climate-smart' non-structural measures, such as bio-engineering, that can better maximize coastal ecosystem functions and services as natural protective mechanisms and provide greater robustness to all plausible SLR impact scenarios in a broader range of socio-economic and bio-physical conditions.

52. APAL is also lacking the technical and operational capacity to monitor and upscale successful pilot tests. There have been isolated point interventions for coastal protection and management with no lessons learned captured. The lack

[14] They would be more useful at half their current height and double the density. A low broad weave netting fence or a more continuous (e.g. heshian) fence would likely work better. At present, they act mainly as pedestrian/traffic barriers.

of established M&E systems prevents new insights to be integrated into coastal planning so that they can be applied for subsequent projects. Combined with the lack of a M&E mechanism is that APAL requires training on how to apply oceanographic data to substantiate good coastal practices. APAL has limited knowledge on physical oceanography and 2D/3D modelling of the marine environment to ensure that ICZM is having a positive impact. Furthermore, although various projects assisted APAL in the procurement of coastal monitoring equipment (PEE and AAP), APAL is not trained on how to maintain or budget for existing equipment so that monitoring can take place in the long-term.

Management of the coastal freshwater aquifer

53. Aridity combined with high climatic variability and high anthropic pressures are characteristics of Tunisia, a water-stressed country. Climate change is predicted to exacerbate Tunisia's water problem. Average fresh water per inhabitant is predicted to drop from 450 m3/inhabitant/year to 350 m3/capita by 2030 (MARH and GIZ, 2007).

54. Tunisia's coastal zones are particularly vulnerable to the lack of fresh water resources and climate change; sea level rise induced by climate change is causing intrusion of saltwater resulting in the degradation of water quality. The potential loss in coastal groundwater resources caused by saltwater intrusion is estimated at 53% of the current groundwater reserves (MEDD and UNDP, 2009).

55. Agriculture, industry and tourism are vulnerable sectors to the decrease of available fresh water sources due to salinization. In fact, 81% of all water resources are used for agriculture and 1% for tourism (MARH and GIZ, 2007). The costs related to water degradation in Tunisia amounts to 0.6% of GDP with irrigated agriculture, overexploitation of groundwater and tourism causing the greatest costs. The loss in agricultural production amounts to 81 million TD per year (2% of the agricultural GDP) owing to the submersion of farming land and the loss of irrigation potential caused by salinization.

56. The lack of freshwater availability is not new to Tunisia. In 1992, the Ministry of Agriculture developed a national programme aimed at substantial water savings through the development of nonconventional water resources, including the reuse of treated wastewater and the direct use of brackish water. Agricultural land, which is often found near the coast, has been equipped with water-saving technologies since 1995. Nonetheless, the volume of wastewater effectively used only in irrigation is well below the volume of available treated wastewater. Therefore, according to the MEDD 2012, it is necessary to apply unconventional water sources, particularly for water intensive sectors such as agriculture and tourism.

57. The Tourism sector is well aware of the need to address limited available water resources. In Tunisia's National Climate Change Adaptation Strategy for the Tourism Sector (2010), it is recommended to consider long-term constraints on water resources and to improve water resource planning. The Strategy states that alternative sources such as rainwater and treated wastewater must be adopted.

58. In practice, the former PISEAU project (See Section A.7) supported efficient use of irrigation water. Along the northwest coast of the Gulf of Tunis, one of the project sites, land is already irrigated with Treated Wastewater (TWW). However, in spite of these advances, the agricultural sector is still subject to significant salinization which hinders crop production. Similarly, the water resource situation is dire in Djerba. In fact, the GoT has begun investing approximately US$90 million in Djerba for the construction of the country's biggest seawater desalination plant to secure the island water supply in the face of fast growing demand and depleting aquifer resources. The stations of Gabes with a production of 30000m^3/day, Gallala (Jerba) - 15 000 m^3 / day and the resort of Zarzis - 15 000m^3/day are planned in the framework of this investment programme.

59. Similarly, private hotels are already taking action in Djerba. Stakeholder consultations during the project preparatory phase indicated that at least 4 of the hotels in the project site have installed individual desalination units. Some are also practicing forms of water recycling. However, the quantity of hotels actually taking action to treat or recycle water is few compared to the current number of hotels and the hotels which are planned.

60. Overall, even with these important interventions on using treated wastewater to irrigate farmland and the use of desalinated or recycled water to support tourism in both project locations, insufficient financial and technical means have constrained the implementation of climate-resilient irrigation and water management measures. Lessons learned from the hotels who are actively trying to manage water sources for their private cost savings must be shared throughout the tourism and even residential sectors. Also, alternative water treatment/recycling measures as well as more water

efficient irrigation practices need to be explored in both project sites. Evaluating and testing new water resource management options is mandatory in order to continue to provide for the current and increasing demands of water for tourism. Similarly, as agriculture is already the most water-intensive sector, other water savings options for irrigation are required to be studied and pilot tested.

Coastal risk monitoring and early warning system

61. Climate change has already manifested itself with more severe, even torrential storms and downpours that are less absorbed by soils and which have caused significant erosion.[15] The indirect effects owing to extreme weather events include an overexploitation of underground resources in order to compensate for the deficit in surface water for irrigation. In response to the direct and indirect impacts from extreme weather conditions, the government has put an early warning system high on its agenda. Along the coast, alerts are planned to be used for seismic disturbances (tsunamis), flooding, coastal surges, strong winds and marrobbios[16].

62. As a first step towards improved observation and forecasting capacity, the Ministry of Agriculture and Environment with support from the GIZ Climate Change Assistance Programme, developed a concept plan for a national climate change multi-hazard monitoring and early warning system. Some initiatives such as the Environment Energy Programme and the Africa Adaptation Programme (described in Section A.7) have provided coastal monitoring equipment to support alert generation.

63. In spite of these initiatives, additional technical assistance, capacity building and investments to address the specific monitoring and information needs of the coastal region are required. Also, it is necessary to operationalise a practical and replicable alert model at the local level.

64. Presently, the network of oceanographic buoys recently deployed by APAL can transmit weather and ocean data in real time. Also, the data transmission platform is operational. However this data is not yet linked to an alert system, including an existing operational regional alert system for tsunamis. This regional early warning system can provide arrival time estimates for tsunamis and inundation maps. However, the alerts and products from the regional center are not downscaled to suit Tunisia and updated by Tunisia specific observations. Furthermore, the spatio-temporal resolution of data sources should be improved and must be adapted to each phenomenon affected by the forecast.

65. Forecasts and alerts for other events (storms, coastal surges, flooding, high winds.) are not yet possible because data exchange with other technical stakeholders such as INM, INSTM has not been established real-time. Also, there is no standard communication protocol to generate alerts and disseminate them in a timely manner to civil protection authorities and ultimately to local communities.

With SCCF Intervention (adaptation alternative) Outcome 2:

66. The SCCF financed interventions will apply an integrated approach to coastal management by introducing a range of tools, required skills and expertise for coastal erosion and inundation mapping, climate change risk assessment and adaptation planning. Risk information to be collected in Component 2 will support the risk-based spatial management plans to be developed in Component 1. The optimal adaptation pathways as indicated by the plans will be implemented in Component 2 on specific high risk coastal locations (at Djerba and the northwest Gulf of Tunis).

67. A systemic and proactive approach of coastal adaptation will be demonstrated in pilot activities. This will contrast with the interventionist and reactive nature of existing attempts to manage the coastal zone in Tunisia which have permeated the concept of adaptation as a 'last resort' in dealing with the threat of an unpredictable climate. The

[15] MEDD and UNDP, 2009

[16] Waves caused by rapid and unusual changes in atmospheric pressure in confined areas

"beginning-of-the-pipe" role for natural habitats and a coastal system[17] adopted through this project will create new opportunities for more flexible, systemic and responsive outcomes that address climate change and the need for improved human wellbeing. The preferred approach will also harness the full potential of natural systems to ensure a sustained quality of life.

68. Specifically, the SCCF financed project will provide direct investments for advanced and climate resilient coastal protection options with a Whole of Systems approach at its core, considering the current coastal land use practices and future priorities, geomorphological specificities of the coastline and a range of plausible scenarios of SLR impacts. It will pilot in two priority areas (northwestern coast of Gulf of Tunis and Djerba) a set of non-structural and bio-engineering shoreline protection methods that go beyond beach nourishment to address erosion and storm surge processes in a greater variety of socio-economic and geomorphologic settings (low-lying agriculture and urban areas, wetlands and beach strand zones).

Northwestern coast of Gulf of Tunis

69. The specific framework adopted for the design and implementation of these measures at the Gulf of Tunis is the Whole of Systems approach[18] where "Living Shorelines" will be implemented along targeted reaches of the Ghar el Mehl lagoon and on the Sidi Ali El Mekki lagoon barrier. 'Living Shorelines' have been successfully carried out for protection of sensitive coastal areas in other Mediterranean countries (France, Spain and Italy) and are being used in Egypt's Nile Delta with support of SCCF. This approach focuses on an innovative set of bank stabilization and management practices that act as erosion-control and storm-surge-protection functions by providing for long-term restoration, maintenance or enhancement of natural habitats and coastal processes.

70. The focus of activities will be the Sidi Ali El Mekki Lagoon area. The SCCF financed adaptation alternative will focus on the area in and around the Sidi Ali el Mekki lagoon (See Maps Annex 3) with a view to demonstrating the effectiveness of a Whole of Systems approach to coastal erosion prevention to facilitate healthy, naturally functioning ecosystems that act to reduce the risk of projected changes in climate, in particular sea level rise which can be up-scaled across the target area. This area is a unique and important ecosystem that provides an excellent opportunity to employ an integrated approach across the exposed ocean coast and sheltered inner lagoon. The activities proposed will address the ongoing stability of the coastal barrier and the public beach heavily used by tourists and pressurised by illegal development in the dune area, extraction of sand in the beach area and stagnation of storm water in depressions that subsequently form along the back beach. The infilling of illegally cut channels in the barrier which have resulted in sediment loss to the inner lagoon will also contribute to increased barrier stability while decreasing sedimentation in the lagoon and contributing to improved water quality.

71. The threat to traditional agriculture practices in the inner lagoon will be addressed through activities to improve flushing and water quality (directed near the entrance in the south) and activities to increase shoreline stability with a combination of barrier and shoreline consolidation techniques that employ indigenous materials. The SCCF alternatives will be based on good-quality information on what impacts are occurring now, their location and the groups and systems most affected as well as reliable estimates of the impacts to be expected under projected climate change. Early warning of potentially alarming or irreversible impacts will be made possible in conjunction with an estimation of different risks and opportunities associated with a changing climate. Importantly, effective approaches for identifying and evaluating both existing and prospective adaptation measures and strategies, credible methods of costing different outcomes and response measures, and an adequate basis to compare and prioritise alternative response measures will be provided. This will ensure the ongoing viability of the socio-ecological system through the adoption of a single integrated approach for the analysis of both social and economic agents and the natural components of the ecosystem.

Northeast coast of the Island of Djerba

[17] Roberts et al. (2011) http://eau.sagepub.com/content/early/2011/11/28/0956247811431412.abstract?rss=1

[18] The Whole of Systems (WOS) approach can be defined as the integration of multi-disciplinary knowledge and the idea of coastal spaces as a whole, including the complex relations between maritime and terrestrial systems. Through such an approach, changes in coastal geomorphology (i.e., beach and dune systems) are considered along with changes in the surface water and groundwater systems for example. The goal of the WOS approach is to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics so that a sustainable outcome can be achieved.

72. Past and current management efforts along the coast of Djerba are largely reactive attempts at coastal protection using 'hard' measures. Systematic coastal planning is absent and ad hoc attempts by hotels to protect their coastal assets have often increased erosion along adjacent stretches of the coast. Sandy beaches are fast disappearing and there is a lack of public open space in the coastal zone. The remaining 'natural' strips of sandy beach on the island are in poor condition and require urgent rehabilitation. The ongoing misuse of the coastal sediment budget in the vicinity of tourist infrastructure will have repercussions for the sustainability of these natural spaces. That is, ongoing failure to adopt a Whole of Systems approach to management of the coastal zone will lead to increased degradation and ultimately disappearance of the beaches, dunes and wetlands that make up the north east coast of the island.

73. The adaptation alternatives proposed by the SCCF financed project for Djerba will facilitate an important shift in mentality towards integrated, systems based management that retains ecosystems functions and has a clear adaptation goal at its core. This will entail preserving the natural coast in a highly developed area by recognizing the importance of the sediment cell and implementing integrated activities across the system. The outcome of these activities will be the demonstration of cost effective, proactive erosion control to hoteliers that is sustainable and ecologically sensitive while conserving Ramsar wetland (at Ras Errmal spit) and public open space (Sidi Yati public beach).

74. This SCCF alternative for the north east coast of Djerba provides an important opportunity to deal with the trade-offs between short term benefit versus long term gain; while it may be unregulated, the tourist infrastructure that exists along the coastal zone is the backbone of the economy and it is important to employ adaptation techniques in this area now to preserve what natural coast is left and give options into the future. The preferred solution for the coast is a medium to long term strategy employing risk based spatial planning that ultimately encourages tourist infrastructure to retreat to allow natural coastal processes in the coastal buffer (setback) or relocate in areas that are extremely high risk (following demonstration of cost benefit). However, this takes time and in the short term it is important to retain as much natural coastal function as possible which means demonstrating an alternative to the ad hoc 'hard' solutions that have been favored in the past. The activities proposed for the north east coast demonstrate to the hotels that a proactive approach of dune building and beach rehabilitation using local materials such as the native palm trees and posidonia grasses will provide them a higher degree of asset protection than the unsustainable approach they currently employ (e.g. dumping builders rubble in the back beach area destroying natural ecosystems function and building ineffective seawalls that have resulted in loss of the beach seaward at several locations). It is also intended to mitigate the mismanagement of the coastal sediment budget in the vicinity of the hotels to provide transferrable benefits to the remaining natural coast in Djerba. That is, the project acknowledges the interconnectivity of the coastal zone and in particular the importance of the consideration of sediment cells in any coastal adaptive strategy. It recognizes that effective adaptation along the coast requires, at its core, an appreciation of sediment transport pathways both now and into the future with the likely addition of sea level rise.

Technical capacities, institutional functions and associated budgets in place

75. Another key component to ensure sustainability and replicability of proposed activities will be a site specific monitoring and evaluation programme to facilitate 'adaptive' approach through the life of the project ensuring ongoing maintenance of the interventions implemented and a subsequent appraisal of effectiveness in the specific coastal systems context. In this manner, the SCCF demonstration activities will establish sustainable adaptation efforts to highlight an integrated approach, and showcase the effectiveness of 'soft measures' integrated within a Whole of Systems approach to adaptation with significant M&E to allow successful transfer and up-scaling around the country.

76. Capacity building for networks of NGOs in both project locations will be provided so that they can support APAL with coastal adaptation practices. Combined with Component 3 which will mobilise funds for community level adaptation, Component 2 will empower the communities so that they understand good ICZM and can assist in the design, installation and tracking of resilience building coastal projects.

77. Furthermore, the project will provide APAL with the technical and operational capacity to monitor and model the coast. They will receive technical assistance in physical oceanography and database management of oceanographic data. They will also receive capacity building in the maintenance of equipment and instruments (e.g., buoys and tide gauges) as well as the means the plan and budget for the operation and maintenance of monitoring equipment.

Management of coastal freshwater aquifer resources

78. The project will also explore and test integrated water treatment and management practices in both project regions that will minimize pressure on current, limited freshwater supplies. By reusing and recycling the existing water resources at disposal, SCCF funds will promote less groundwater extraction and effectively minimize SLR-induced sea water intrusion and salinization. Currently, the water intensive agricultural sector uses shallow and deep wells in Djerba for irrigation. In the Northwest part of the Gulf of Tunis, the majority of land (2,300 ha) is irrigated by transporting water from the Mejerda River. Approximately one-third of the agriculture (700 ha) is supported by irrigation with Treated Wastewater (TWW).

79. To detail best water management practices in the agricultural areas of both project zones, an evaluation will be made on the current state of the local water resources and their predicted states due to sea level rise, development and resulting salinization. The two zones will be analysed to find the most water efficient methods for irrigation. For instance, a less water intensive spray technology will be evaluated to conserve irrigation water by TWW in the Northwest of the Gulf of Tunis. The methods will be evaluated by continual monitoring of the salt levels in the coastal aquifer systems and will be adjusted based on measurements and projections of aquifer yield and demand.

80. On the basis that the agricultural sector is the most water-intensive sector in Tunisia (consuming over 80% of freshwater supplies), this evaluation and the best irrigation practice guideline to be developed have the potential to provide significant water savings for both regions. In addition, development of best practices will adhere to the Ministry of Agriculture's programme and aim to promote substantial water savings measures to hinder and mitigate potential impacts from the salinization of agricultural land.

81. Current water recycling and desalination practices used by hotels in Djerba will also be documented and made public knowledge, including the costs and benefits. During project development, Stakeholder consultations with hotel owners indicated that several hotels in the project zone have installed desalination units for the purposes of supplying additional potable water to patrons. A public awareness campaign on successfully applied desalination and water recycling practices will motivate other hotels to take action. Also, an evaluation on the potential for irrigation by non-conventional water (e.g., treated wastewater and/or desalinated seawater) in green spaces of the tourist areas in Djerba will be conducted.

Coastal risk monitoring and early warning system

82. Building on and complementing the GIZ project, the project will also help APAL and other relevant technical institutions to conduct more coastal risk monitoring. The forecasting database will be strengthened by acquiring 3 tide gauges and 1 buoy. The multi-risk Early Warning System will be further improved by facilitating communication and data exchange between the information production technical institutes including INM, INSTM. Data will be fed into the Information System for Decision Aid (SIAD, Component 1). A communication protocol will also be developed so that the information producers can communicate with the information dissemination groups including the lighthouse and beacon services and the Navy National Guard. The protocol will define how to get the alert information to the local coastal communities in a timely manner.

83. To further support alert dissemination to communities, SCCF funds will be used to promote a collaboration between APAL and INM (the National Weather Service) to develop storm forecasting bulletins for the coastal communities. An urgent intervention plan will also be developed to be able to guide the appropriate local authorities and community members with how to prevent and mitigate impacts from flooding.

84. To support coastal adaptation implementation and risk monitoring, SCCF funds will build on on-going or planned baseline projects (discussed in Section A.4) in the following manner:

- Build on KFW's ***Coastal Protection Programme*** Phases I and II to learn which landscaping plants are best to combat marine erosion.
- Build on the ***Development work in the coastal zone of the Monastir Bay (1st Phase)*** in terms of best practices for beach nourishment.
- Take lessons learned from the ***Coastal Protection from Catharge to Gammarth*** project in terms of how to protect coastal forests and agricultural terraces.

- Build on the ***MedPartnership***'s experience in reinforcing methodologies to mainstream climate considerations into ICZM planning. The SCCF financed project will incorporate lessons learned on appropriate ICZM interventions as demonstrated in MedPartnership's pilot site.
- Work with the ***Water Climate and Development Program for Africa*** (WACDEP, 2014-2016, 9.2 m USD) to develop capacities to build resilience to climate change through better water management.

85. The SCCF financed project will also build on relevant projects in the following manner:

- Build on the support for ocean monitoring, equipment calibration and maintenance and 2D/3D modelling of ocean currents provided by the ***Environment Energy Programme*** of the Union European
- Build on the ***IASON*** (20,000 Euro, 2013-2015) project funded by the European Commission / Seventh Framework Programme: The SCCF financed project will work with IASON to improve climate change related coastal monitoring and to exploit research and innovation on climate resilient water and soil management.
- Collaborate with the ***Tunisian-Bavarian Cooperation*** and their monitoring studies of lagoon ecosystems to inform Integrated Coastal Zone Management.
- Build on the ***Arab Climate Resilience Initiative (ACRI)*** trainings at the regional level on the use of the toolkits in order to strengthen capacity in integrating climate change into gender-sensitive development plans and poverty reduction plans at a national level. The SCCF financed project results will feed the lessons learned and best practices to be documented under ACRI so that requirements for adaptation can be integrated into the regional trainings planned on successful resilience projects for countries of the Arab region. Furthermore, the SCCF financed project will work with ACRI to establish monitoring schemes for SLR.

Outcome 3: Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures

Without SCCF Intervention (baseline) Outcome 3:

86. Specific to coastal adaptation, the 2008 SNC coastal study has estimated the total capital cost of adapting to a 0.5 meter SLR scenario in Tunisia is approximately 1 billion USD. Although still tentative and probably underestimated (as it does not fully consider the costs of private adaptation), this figure gives some indication of the financial burden that climate change poses on the country economy and national budget. Financial resources in Tunisia, both nationally and internationally, are unlikely to be sufficient to cover the entire expected impacts. Nonetheless, as stated in the National CC Adaptation Strategy of the Tourism Sector (2010), additional funding sources are required, on both national and local levels, to sustainably support and upscale adaptation efforts in the long term.

Financing for community based coastal adaptation

87. In Tunisia, adaptation efforts are generally undertaken at the national level with the involvement of APAL and more recently, due to the revolution of January 2011, at the local level. (The democratic revolution of January 2011 empowered the development and force of NGOs/CSOs in Tunisia). This was evidenced in the Africa Adaptation Project when a call to environmentally-focused NGOs to build CC awareness was put out to tender. Twenty (20) NGOs expressed interest and 7 were retained to assist with climate change and climate change adaptation awareness raising. In Djerba, the ASSIDJE NGO conducted CC awareness-raising for the coast of Djerba during 2012 through the AAP project. They received 6,500 USD to assist with this task. However, in spite of this one-time support by AAP for NGOs, NGOs/CSOs throughout Tunisia are lacking financial resources to conduct environmentally-related actions.

88. This is in contrast to the private hotel industry in Djerba. Hotels are currently financing their own ad-hoc coastal protection measures. For example, various hotels have built seawalls in Djerba to combat erosion. However, although the construction of sea walls has been an attempt to stabilize the beach, these hard structures are actually exacerbating the loss of sand. As indicated during the first workshop during the project preparation phase, the hotel industry in Djerba is fully aware of the impacts of erosion. However, the tourism industry has no knowledge on what actions can be used to sustainably mitigate the impacts of erosion and Sea Level Rise (SLR). Consequently, hotels are unwittingly

implementing examples of mal-adaptation. For instance, beachfront hotels are removing natural posidonia seagrasses because of their odor and unaesthetic appeal. However, it has been well established in Djerba that the posidonia when compacted in layers with the sand acts as an effective natural stabilization technique.[19] A case in point is one private residence along the Djerba coast whose owner has been collecting native posidonia seagrasses and layering them with sand over the past 12 years. This residence shows the only beach front property which has successfully resisted erosion.

89. Successful demonstrations of soft adaptation techniques in Tunisia need to be shared with the municipality, the NGOs/CSOs and the private sector (most notably hotels in Djerba) so that best practices can be scaled up. However, in order to finance up-scaling, funding mechanisms have to be created to support the implementation of soft adaptation techniques. On a small scale, NGOs/CSOs do not have access to funds to perform small-scale adaptation measures such as sand-posidonia layering or fabrication and installation of palisade (ganivelle) fencing. In contrast, private hotels have some funds but have limited awareness, knowledge and motivation to use soft, integrated approaches.

Financing on the national level for coastal adaptation

90. Currently, significant funds are required to support adaptation in Tunisia. According to an IDRC study[20], relative to other North African states, Tunisia has the highest number of requested adaptation activities. However, of the 808 m USD funding required, they have raised only 28 m USD as of October 2013. In order to address the lack of funding, the IDRC assessed Tunisia against 2 criteria:

1. National framework conditions and readiness to access and absorb adaptation finance; and
2. Overall availability of data and expertise and knowledge/information sharing.

91. It was concluded that Tunisia is well-positioned to attract and receive adaptation finance. However, mechanisms and institutional capacity building to facilitate the mobilization of funds are required.

92. The challenge is that Tunisia has limited expertise and practical experience in making use of existing financing instruments and in finding innovative ways to attract and direct appropriate levels of resources towards long-lasting and planned adaptation interventions. For coastal planning, this includes finding financial incentives for strategic retreat from the coastline and limiting development in low-lying coastal floodplains and high-hazard areas. Also, while a significant portion of coastal adaptation investments is likely to generate private goods and benefits (such as restoring beaches for specific tourism resorts), the corresponding costs and financing efforts are still inequitably shared between the public and private sector. So far, there have been no mechanisms to increase economic returns and financial contribution from the private players that will benefit the most from coastal adaptation.

93. Numerous small funds and taxes exist in Tunisia. These include among others, the National Fund for Habitat Improvement (2005), the Fund for the Protection and Aesthetics of the Environment (2005) and the Tax for the Protection on the Environment. However, each is associated with a particular institution and none are managed by financially-savvy personnel which have the capability of expanding and diversifying portfolios to have sufficient capitalization.

94. The existing National Fund for the Protection of Tourism Zones (NFPTZ) could provide a mechanism to increase returns. However, in its current form, the fund lacks the necessary regulations and resource base to adequately mobilize funding in support of critical adaptation investments. Indeed, the main mandate of the NFPTZ is to maintain the aesthetic value and attractiveness of tourism areas and not to fix environmental and climate-related problems such as beach erosion. For example, between 2002 and 2010, the NFPTZ spent a considerable budget for the installation of tourism facilities and equipment (beach umbrellas, outdoor chairs and tables, showers, toilets, etc.) in more than 100 beaches across 13 governorates. However, no significant investment was made to protect/rehabilitate the beaches and other tourism-supportive coastal systems from environmental degradation or SLR effects. Even though the NFPTZ would have the appropriate mandate and structure, its current level of resources would not suffice to engage meaningfully into adaptation works such as beach nourishment which costs around US$1 million per km.

[19] One volume of Posidonia can retain three volumes of sand according to ANPE.

[20] Tippman, R., A. Agoumi, L. Perroy, M. Doria, S. Henders and R. Goldmann, ***Assessing Barriers and Solutions to Financing Adaptation Projects in Africa***, IDRC report, October 2013

95. While some financial reforms do happen in the tourism sector that could potentially offer valuable funding sources and mechanisms for adaptation, this sector remains insensitive of long-term environmental issues and associated financing needs. A prime example is stated in the new National Tourism Strategy 2016. The plan is to create an airport tax to increase the tourism budget while decreasing an existing Tax for Sustainable Development, from 1% to 0.5% in order to focus on other more revenue-generating taxes. The Tourism strategy demonstrates its ability to generate revenue. At the same time, it shows how its aim is to not protect the environment or build resilience to climate change unless revenues are feasible. This is somewhat paradoxical given the critical importance of well-preserved shorelines for the tourism economy and for its resilience to sea level rise.

96. Tunisia is therefore lacking the capacity and incentive to explore both the international climate change financial landscape as well as to exploit domestic financial resources from taxes and existing funds to earmark financing for coastal adaptation. As indicated by Stakeholder consultations with the Tourism boards (AFT and ONTT) part of this issue is that the most revenue-generating sectors such as Tourism must focus on the short-term (e.g., next 5 years maximum). As such, they do not consider mobilizing financing to address the potential gravity of climate change impacts in the long-term. As indicated by the Economic Report, Tunisia's widening trade deficit, combined with weak inflows of tourism receipts has put external balances under renewed pressure. In fact, the private sector's focus on the short-term has been exacerbated by weak inflows of tourism receipts in 2013 and a widening trade deficit.[21]

97. Furthermore, the sustainability of national funds is dependent on having governance mechanisms in place to ensure appropriate financial management, transparency and accountability. As indicated in the National Tunisian report for the UNFCCC in October 2011[22], Tunisia is victim to the risk of corruption where funds are often inappropriately channeled to serve short-sighted needs. The long-term vision of adaptation without oversight presents a twofold risk of diverted funds and sub-standard work which may put populations at even more risk of climate extremes.[23] The need for increased technical specialization and ambiguous definitions of adaptation activities (as opposed to traditional development) make the benefits of adaptation more difficult to monitor, resulting in the potential for massive diversion of funds. From needs assessments, through the preparation and bid design phases, to contract implementation, corruption is a risk. Therefore, Tunisia requires an overarching monitoring and evaluation mechanism and/or body to ensure that funds are being used appropriately.

Introduction of risk reduction and transfer mechanisms

98. Additionally, Tunisia requires an awareness and understanding of the benefits of using fiscal and market-based instruments not only to accumulate financial capital but also to incentivize risk reduction. At present, there are no incentives for encouraging private firms and households to engage into risk-abating measures and redirect private investments from the coast towards inland or less risky coastal areas. Moreover, the tourism industry is not charged with responsibilities to have coastal protection (against erosion) and risk reduction plans (e.g. flood risk management plans) or to climate proof their infrastructure in a way that reinforces robustness of the coast and does not block coastal sedimentation processes or erode natural coastal buffers, such as sand dunes.

99. Poor land management and weak enforcement of building codes has led to unsustainable development in sites at risk to sea level rise, erosion and coastal inundation. Significant losses from property damage have followed natural disasters (e.g., September 2003 flood).[24] Presently, the government is expected to provide support for public and private reconstruction along the coast within the Maritime Public Domain because property owners, namely hotels in Djerba, are not required and aware of property catastrophe insurance or disaster risk insurance which can be used to cover the costs of coastal impacts such as flooding.

100. The underlying issue is that with increasing SLR and erosion, Tunisia cannot keep pace with its rapidly growing asset bases at risk. It does not have dedicated resources for reducing exposure. Insurance offers an opportunity to transfer extreme weather and climate change risks to private investors or the international market (reinsurance).

[21] Economic Intelligence Unit, Tunisia Country Report, July 2013.

[22] Préparation à la Conférence des Nations Unies sur le Développement Durable (Rio + 20), National Tunisian Report, October 2011.

[23] Transparency International, *Global Corruption Report*. 2011 http://www.transparency.org/whatwedo/publications/doc/gcr/

[24] Torrential rains that occurred in September 2003 devastated the greater Tunis area. These probable torrential rains with a 100-year return period resulted in the death of four people and damage valued at around 432 m USD.

However, not one hotel in Djerba has or is aware of disaster risk insurance[25]. They are also unfamiliar with cases where introduction of insurance and risk reduction products has been successful in similar developing countries[26].

With SCCF Intervention (adaptation alternative) Outcome 3:

Investment mechanisms for community based coastal adaptation

101. As shown through successes of previous and on-going projects (Africa Adaptation Project, KFW) there is existing knowledge on effective soft adaptation techniques to build beach resilience. However, these techniques have not been duplicated due to lack of funds, and overarching policy framework and lack of awareness. NGOs in Tunisia are well placed to provide awareness raising. For instance, the ASSIJE NGO in Djerba provided awareness raising on Climate Change to the coastal area during the Africa Adaptation Project. As indicated during the Stakeholder consultations they are very active and eager to save the coastal and agro-ecological zones (agriculture being the dominant livelihood in the northwest coast of the Gulf of Tunis). It seems logical then to empower the NGOs and local communities to have access to funds earmarked for coastal adaptation projects.

102. In order to justify soft measure implementation, a Net Present Value (NPV) analysis of a planned community-based coastal adaptation measure versus implementation of a hard engineering coastal barrier was conducted (Annex 2b). In the NPV study, three cases were weighed, i) the base case of doing nothing, or the Business As Usual (BAU) case where erosion continues, ii) building the beach by using community manpower to layer posidonia sea grass with sand and iii) constructing a breakwater (riprap hard measure). Analysis indicates that during the first year, the initial cost of the soft measure is significantly lower than the potential loss of income hotels could potentially experience with beach erosion (i.e., the case of doing nothing or the BAU case). In contrast, if a breakwater is constructed, the cost of construction during the first year well exceeds the potential damage associated with the cost of doing nothing. Past the first year, the cash flows of the soft and hard cases were compared over a 10 year period. Note that the lifetime of the breakwater was assumed to be 10 years. Maintenance was considered to be minimal for the hard option while the maintenance and monitoring costs of the soft option were considered each year. Results demonstrate that the NPV was greater for the soft option over the 10 year period indicating that it is the better adaptation option from a financial perspective. A conclusion taken from the analysis is that community-based implementation of soft measures is a worthwhile investment.

103. To facilitate the mobilisation of funds for innovative soft coastal adaptation measures, the project will strengthen the ability of the Tunisian government to better use existing financial mechanisms for coastal adaptation and management. It will work closely with local tourism companies and investors, including banks and link up with Tunisia's Green Economy Initiative. Specifically, Component 3 will encourage private public partnerships so that the influential and prevalent private tourism sector can get involved in sustainable coastal management.

104. Specifically, SCCF funds will be used to provide joint grants to an NGO/community/hotel collaboration to improve coordination between the tourism and public sectors and promote shared management. By leveraging the private sector and creating an enabling environment for adaptation activities, the project will support NGOs to have appropriate tools to build fences (palisades, ganivelles) and implement soft coastal protection measures under the guidance of APAL. Money will be granted based upon selection criteria which will demonstrate the hotels/resorts are committed to apply robust and sustainable beach protection measures to support long-term adaptation strategies and that NGOs/CSOs/community members have a good track record with implementing and managing projects. SCCF funds will be used to provide additional training to local NGOs/CSOs or community groups in financial literacy and cash management. Another option to be evaluated during project implementation is to fund existing small grant programmes for CSOs on the local level to conduct coastal adaptation projects. Through the AAP project, CSOs have demonstrated

[25] Disaster risk insurance encompasses property catastrophe risk (micro-)insurance (e.g., for private dwellings) where losses are caused by widespread adverse natural events

[26] The World Bank's Disaster Risk Financing and Insurance Programme,

[26] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTFINANCIALSECTOR/EXTDISASTER/0,,contentMDK:23305437~menuPK:8921438~pagePK:64168445~piPK:64168309~theSitePK:8308421,00.html

that they are capable of providing environmental awareness. Stakeholder discussions during project development further indicated that CSOs are knowledgeable and motivated to implement small coastal adaptation projects.

105. SCCF resources will also be used to finance community nursery development (with an emphasis on nurseries managed by women) to provide a supply of local vegetation which will be used to support dune fixation and other soft coastal protection measures. The plants and planting services will be sold to private residences and hotels. If the nurseries prove to be lucrative, it is likely that an existing micro-finance scheme in Tunisia will be used to scale-up nursery operations. A possible application of scaling-up will be to provide plants to Living Shoreline applications throughout Tunisia (such as in the Mediterranean) which would require kilometres of dune fixation vegetation to be planted.

106. By providing joint grants, the tourism industry will be incentivized to apply the optimal cost-effective adaptation options to be provided by the guidance package to be created in Component 1. The use of locally-sourced, environmentally friendly materials to protect their beaches (e.g., posidonia-sand layering) will most likely be one of the recommended options. Such an option can be fully supported by the joint grants because the NGOs/CSOs or community groups can provide the local manpower to implement this simple sand-building measure. The joint grant concept thus fully supports Tunisia's goal to support ICZM because Stakeholders both public and private will be mandated to work together in order to receive the financing. At the same time, the joint grants will support local coastal management which when demonstrated in pilot sites, can easily be replicated in future applications, past project completion.

107. SCCF funds will also be used to create a partnership with the Green Economy Initiative (GEI)[27]. The GEI has an objective to promote "green employment" and "green industry" and has the long-term vision of finding sustainable financing to combat degradation. During project preparation, GEI expressed interest in becoming an investment partner in the local production of "palmivelles". Palmivelles would be a unique palisade (i.e., ganivelle) fencing made of the spine of native palm tree leaves which would be used to capture sand and rebuild sand dunes. The soft coastal adaptation technique has demonstrated success in a small pilot project by APAL. The fabrication and planting technique can be easily performed by community members, thereby supporting local green employment and community-based coastal adaptation. The motivation for producing palmivelle was instigated during the AAP project when APAL had to import ganivelle fencing material from France due to its unavailability in-country. APAL imported a type of chestnut tree wood to act as fencing which, although the material was effective, was considered too costly to perform on a larger scale.

108. Through Component 3, the proposed project plans to analyse the feasibility and market demand of locally produced palmivelles which would be fabricated from local Djerba palm trees. If the technique is proven to be succeed in a large pilot test and there is a market to purchase the product, GEI will support the development of a local industry and labor force. A market study must initially be conducted because there is no sense of the needs and profitability for palmivelles. A few hotels expressed interest in using ganivelle after the AAP pilot project; however, the locally-produced palmivelle must demonstrate its effectiveness on a large scale to a large audience. As indicated during Stakeholder consultations, the GEI's interest in analyzing the production of palmivelle is further supported because they would like to test the use leftover palm debris as biomass (which can serve as energy or fertilization).

109. The market study will include two parts; 1) pilot testing the palmivelle technique by APAL and 2) a financial feasibility study by the Green Economy Initiative (GEI). (For example, the GEI will analyze the prospective of starting a Trust Fund to financially support the palmivelle concept.) To support the market study, GEI will provide cash co-financing of approximately 30,000 USD to support the financial feasibility study. If the market study can demonstrate that palmivelle production is financially and technically feasible, it is expected that the palmivelle concept will provide a local green industry that be marketed as an eco-friendly approach for dune rehabilitation for coastal management and possibly desertification. A successful pilot test by APAL will ensure the technology can be up-scaled and possibly exported.

Investment mechanisms on the national level for adaptation

110. Financing mechanisms to support coastal adaptation on the national level will also be explored. Efforts will go towards increasing the capitalization of existing environmental funds through the diversification and broadening of their

[27] The Green Economy Initiative is partly funded by ESCWA and partly by the Government of Tunisia

resource bases. a systematic review of the existing national and local financial resources that could be optimized and better mobilized for adaptation will be conducted. In this regard, technical assistance will be provided to increase the financial contribution of environmental funds.

111. Specifically, capacity to mobilise funds will be built within the National ICZM platform (Component 1) so that it can identify a mix of financing sources and appropriate fund channelling mechanisms for coastal adaptation by exploring both the international climate change financial landscape (e.g., Adaption Fund) as well as domestic financial resources from taxes and existing funds. The SCCF financed project will collaborate with the Global Water Partnership and the MedPartnership which plan to also try to identify international financing.

112. The numerous national environmental funds including the National Fund for the Protection of Tourism Zones (NFPTZ) will also be analyzed through Component 3. Based on this analysis, an Environmental Fund Management System will be developed by the National ICZM Platform. The role of the Environmental Fund Management System will be to create a synergy among existing environmentally-related funds so as to enhance their collective power to mobilize funds. In each respective environmental ministry there is a lack of financing expertise which has meant that the funds are not well capitalized and are poorly managed. An overall financial expert will be engaged to facilitate fund mobilization across sectors as part of the Environmental Fund Management System. The expert will provide a roadmap on financing strategies.

113. The project will support the Ministry of Equipment, Land planning and Sustainable Development and the Ministries of Finance and Tourism to analyse the feasibility of a ‘’climate change contribution’’ into the new fiscal system proposed under the draft tourism tax bill. The idea is for SCCF funds to support APAL to work motivated hotel and resort owners (such as those already participating in Blue Flag label[28]) to employ voluntary visitor fees in certain locations (airport, natural parks, tourism beaches, etc.). The fees will be used to support community-partner adaptation projects. APAL will work with hotel/resort management to devise a portfolio of adaptation measures which can be financed by the voluntary fees. The measures would be applied with the partnership of local NGOs/CSOs and community groups to inspire a sense of shared management and to save money with the use of local manpower. These voluntary fees will be used to finance beach rehabilitation, fencing, dune protection etc. which will provide benefits to the resorts, tourism business and also be used as a market instrument for the “climate smart / responsible” resorts, adding on to the environmentally-friendly, Blue Flag label concept in Tunisia.

114. Furthermore, the feasibility of charging a certain percentage of each tourism sector investment programme (determined by scale, location and type of investment) to finance environmentally and socially sound adaptation measures will be evaluated. This will entail examining appropriate ways for enhancing and adjusting the structure, collection and allocation of the existing fees already leveraged by the Ministry of Finance from the concessions awarded within the Maritime Public Domain. The project will assist with the revision of the main policy priorities, eligibility criteria and regulations governing existing environmental funds to allow for a significant portion of its resources to be directly allocated to the financing of priority adaptive measures (such as beach nourishment, dune protection etc.) in vulnerable areas. Potential gaps in geographical coverage, disbursement procedures and management rules that may affect the efficiency of environmental funds for coastal adaptation will be reviewed and revised.

115. To ensure sustainability with all the Environmental Funds, SCCF funds will be used to develop required governing mechanisms and conditions of access for all adaptation financing schemes. A Monitoring and Evaluation scheme to document lessons learned on how to implement no/low regrets investments will also be developed. Strengthened governance mechanisms which reduce existing corruption risks will make climate change policy more effective and successful.

Introduction of risk reduction and transfer mechanisms

116. The project will also help the GoT to explore and set up innovative fiscal regimes and mandatory insurance schemes targeting private properties as a means both to catalyse additional finance for adaptation. The application of such schemes will provide incentives for gradual relocation of key socio-economic assets away from the coast. It will also incentivize risk adverse behaviours across vulnerable businesses and households. To implement the schemes, the

[28] http://www.blueflag.org/ The Blue Flag label in Tunisia presently used by hotels in Tunisia is a marketing mechanism used by hotels to demonstrate they are environmentally-friendly

project will work closely with the Ministries of Finance and Interior to build innovative public-private partnerships such as with the insurance/reinsurance industry. (It should be noted that the application of taxes was not considered a feasible option in the current political climate and as indicated by Stakeholder consultations.)

117. To discourage building activity in risky areas, encourage adoption of climate-proof construction standards, and ultimately, reduce moral hazard across developers and owners, as recommended by the 2010 National Climate Change Adaptation Strategy for the Tourism sector, a system of Transferrable Development Credits (TDC) will also be introduced to the municipalities in the 2 project zones. The idea is to create market incentives without the application of taxes to shift development to areas where development is preferred.[29] Through zoning ordinances, local governments designate areas where they want to discourage development ("sending areas"). The ordinance allows property owners in these areas to sell development credits to areas where the local governments want to encourage development ("receiving areas"). The buyer can then use the credit to exceed development densities, floor areas, or building heights in receiving areas. The property owner of the restricted parcel receives financial compensation for forgoing development and preserving his or her property. Such a system has been well-established in the United States in coastal areas prone to SLR like Florida. As shown in such areas, a TDC program can be used to address sea-level rise by establishing and calibrating a development credit market in a manner that gives landowners affected by SLR an incentive to transfer their development rights rather than build on threatened properties.

118. Another innovative financial avenue to be explored includes the introduction of property insurance which will be used to incentivize development in low risk areas (i.e., Development in areas not at high risk to storm surges, erosion, etc. will have lowerer premiums). Insurance can provide effective risk sharing and risk reduction incentives in coastal built environments if it is designed and introduced appropriately. In order to transfer risk to the private sector such as the tourism industry in Djerba, a market study will be conducted to determine feasibility; SCCF funds will support analyses on the adequacy of monitoring equipment, the required insurance production systems (e.g., underwriting, product design and pricing, claims settlement), necessary delivery channels, and required regulatory frameworks. Making property insurance compulsory (e.g. linked to credit) and/or integrating it within social protection programs will also be analyzed in order to ensure that the critical market size for profitability can be achieved. Similarly, the value and feasibility of micro-insurance systems will be tested to ensure that the most vulnerable and poor households can also benefit from property insurance.

119. In order to ensure sufficient distribution of property insurance, SCCF funds will be used provide awareness to the Tourism Boards and property owners on options currently available to distribute risk such as the use of re-insurance to transfer risk to the international market and how complementary insurance/credit packages can increase the uptake of both financial services. Capacity reinforcement on risk management options will be provided to at least 100 Tourism board members, hotel proprietors and owners of beachfront residences with the support of SCCF funds. Based on the fact that no hotel owners or residences have property insurance, it can be conservatively expected that at least 200 households (including hotels and resorts) will adopt property insurance as a risk sharing mechanism by the end of the project.

120. To support adaptation fund mobilization and the introduction of insurance, SCCF funds will build on baseline projects (discussed in Section A.4) in the following manner:

- Collaborate with the ***Green Economy Initiative*** (GEI) - The SCCF financed project and the GEI will develop a partnership to support "Green Employment" and Green Industry. Together both the SCCF financed project and GEI will finance a joint market study to determine the technical and financial feasibility of producing locally produced ganivelles or "palmivelles" from local palm trees. See Co-financing letter attached.
- Build on the ***Water Climate and Development Program for Africa*** project (WACDEP, 2014-2016, 9.2 m USD) which aims to develop 'no regret' financing and investment strategies for climate change adaptation.
- Collaborate with the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** (2013-2014) project by using the training materials on the economics of adaptation as it relates to medium- and to long-term national and sub-national planning as well as in evaluating and apprising different adaptation investment projects. The SCCF financed project will also exploit knowledge on emerging sources of climate finance under the UNFCCC mechanisms as well as outside sources from development banks, the private sector, etc. Based on Stakeholder consultations between UNDP and the Global Water Partnership, it is

[29] Grannis, J. Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use, October 2011.

planned that the SCCF financed project and the Economics of Adaptation Project (for which the GWP is a member) will work together to develop a balanced portfolio of investment options for climate resilient development where SCCF financed project will focus on coastal adaptation.

- Complement the ***MedPartnership***'s objective to leverage long-term financing by building capacity within the National ICZM platform to find funding mechanisms for coastal adaptation by exploring both the international climate change financial landscape and existing National Funds. Also, the development of the Evironmental Fund Management System to be developed in the project will be used to create a synergy among existing environmentally-related funds so as to enhance their collective power to mobilize funds.

121. The SCCF financed project will also build on relevant projects in the following manner:

- Build on the ***Arab Climate Resilience Initiative's (ACRI's)*** experience in engaging with the private sector as a planning and implementation partner in adaptation and mitigation interventions for SLR and coastal erosion activities.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

122. Risks and recommended countermeasures were identified during bilateral consultations during the project preparation phase.

Key risks and mitigation measures underlying project development are indicated in Table 2.

Table 2: Key risks and assumptions

Risk	Level	Mitigation Measure
Insufficient institutional engagement and coordination may prevent successful project delivery especially in the current transitional context, in Tunisia	Medium	A strong commitment from the GoT and the political leadership of the Ministry of Equipment, Land Planning and Sustainable Development will minimize such a risk. Additionally, the project will be prepared and carried out under the oversight of the National Commission for Natural Resources, which brings together the main government institutions concerned with this project. The Commission, placed under the authority of the Prime Minister, will play a key facilitation and coordination role between sectors with the assistance of the climate change focal point. Also, the project has been designed to account for the lessons learned from UNDP AAP project including best strategies and arrangements to ensure active inter-ministerial engagement throughout implementation.

Resistance among key socio-economic stakeholders (i.e. tourism operators, property owners, etc.) to participating in new economic instruments for adaptation	Medium to high	To minimize this risk, the project will hook up with Tunisia's 'Green Economy' initiative that was launched in 2013 with a Strategy for 2016-2036 and which aims *inter alia*, to support economic policy reforms and new incentive mechanisms for increasing public and private investment into the environmental sector. The project will add a coastal adaptation layer to this process and will use it as a strategic vehicle and multi-stakeholder platform to foster an active policy dialogue on the desired economic instruments. It will proceed through concerted negotiations involving the government institutions, representatives of key socio-economic groups and other key partners and will seek to reach a broad-based consensus on economically and socially acceptable fiscal and market-based mechanisms for coastal adaptation. Further, by making explicit the costs and benefits of early adaptation and protective actions, it will take an evidence-based approach to raise awareness of the private sector in coastal areas, especially the tourism industry players, and secure its buy in and engagement into the new financial and insurance systems, including the upgraded National Fund for the Protection of Tourism Zones. The project will also take advantage of the growing trend to evaluated the economics of adaptation (e.g., GWP-UNDP regional initiative) Insurance companies are not willing and incentivized to study the feasibility of adapting disaster risk or property insurance and do not think the hotels and property owners are willing to engage in an insurance scheme
Lack of continued Monitoring and Evaluation to document lessons learned from soft protection measure applications	Medium	Soft technique data will be collated in a systematic manner to inform decision-making processes. Also M&E mechanisms for the new soft interventions will appraise effectiveness and interventions in a specific coastal system context to allow successful transfer and up-scaling around the country
Data sharing for risk assessments is hindered by lack of coordination / willingness of agencies to share data	Medium	Data will be centralized in the existing Information System for Decision Aid (SIAD) housed at APAL. The SIAD system includes a website which will be improved to facilitate data exchange with other sectors in Tunisia.
Water and coastal management strategies are made ineffective by an unanticipated increase in the frequency of flood events, coastal surges which jeopardizes coastal protection and water conservation	Medium	Management plans will take into account worst case scenarios of extreme weather and climate change to have a margin of safety for applied interventions. Also, robust equipment will be procured including spare parts and technical personnel will be trained to maintain equipment and any soft solutions applied.

measures and damages coastal monitoring infrastructure		
Emphasis on shared coastal management and coordination between private hotels and NGOs and/or the municipality is hindered because of self-interests and contrasting agendas	Medium to High	Financing will be granted to a joint NGO or community group and hotel or private sector collaboration to implement coastal adaptation measures. NGOs are already motivated (ASSIDJE, etc) and have the knowledge and ability to perform public awareness on coastal erosion. With training from APAL, the NGOs will become capable and can act as locally-sourced manpower to implement interventions for both public and private beaches. Also the Green Economy Initiative will facilitate a future PPP by supporting potential green economy / green industry with an initial market study on the feasibility of using locally-sourced palmivelles as a form of fencing to capture wind-driven sand. The idea is to support the community by creating jobs while developing a private industry to lead palmivelle production.
NGOs/CSOs do not have sufficient financial literacy to manage funds for small-scale coastal adaptation projects	Low	The third component includes training for NGOs/CSOs by a national financial expert so that they can manage SCCF funds for small coastal adaptation projects. Also, one selection criterion to choose NGOs to implement coastal adaptation project will include the demonstration of a good track record in implementing and managing projects.

A.7. Coordination with other relevant GEF financed initiatives

The SCCF financed project will build strategically off of the following relevant initiatives:

123. **Protection work for the cliffs at Monastir Bay (2nd phase)** (USD 5.9m, funded by DGSAM, 2013-2014) project aims to improve the stability of Monastir cliffs which have been degraded due to landslides and wave attacks. It is expected that the wave action will be amplified with rising sea levels. For this reason, the project aims to stabilize the Monastir cliff with the following actions: a) remodelling the cliff's slope and developing new embankments and berms to increase its stability (soft action); b) creating a set of surface and subsurface drainage structures to limit cliff erosion upstream; c) strengthening of the cliff with physical measures to reduce wave action; d) creation of a breakwater in the front to reduce the energy of the waves on the beach.

124. ***Environment Energy Programme (PEE)*** (USD 1.2m, funded by the European Union, 2009 – 2014)[30]***:*** The two objectives of the project are to i) strengthen the current system of coastal monitoring by acquiring tidal monitoring equipment and buoys and ii) to strengthen APAL's scientific and technical capacities. To date, 2 fixed and 2 mobile buoys were purchased. The aim is to improve the design and operation of APAL's Decision Support System (SIAD). It also has provided training on the maintenance and calibration of equipment as well as with Matlab and Ocean Data View software. Due to the PEE project, APAL has gained experience in working with Metadata and with performing 2D and 3D modelling of ocean currents. The project takes place in the Gulf of Tunis, the Gulf of Hammamet and the Gulf of Gabes.

[30] http://www.pr-e-e.org/

125. ***IASON*** (20,000 Euro, 2013-2015) European Commission / Seventh Framework Programme: Two relevant goals of this project are to support i) climate change related coastal monitoring and 2) research and innovation to improve resource efficiency, with respect to the management of water and soil.

126. **AMCP et Pêche Durable (**AFD / FFEM, 1 m EUR, 2014-2018) : This project is focusing on the promotion of sustainable and alternative uses of marine fishing in a network of marine and coastal protected areas in northern Tunisia.

127. The ***Cross-border Cooperation in the Mediterranean***[31], ENPI CBC MED is funding 3 projects: 1) Med-Phares (400,000 EUR 2014-2015): This project is focusing on the rehabilitation of lighthouses in the archipelagos of the Galite and Zembra and Zembretta; 2) ***MEET*** (40,000 Euro, 2013-2015): This project is emphasizing the development of an eco-tourism strategy across the Mediterranean and creating an Ecotourism network in protected areas of the Mediterranean; 3) The ***MEDSANCOAST*** (280,000 EUR 2014-2016) project is focusing on innovative models of resource governance of coastal and marine areas for strategic Mediterranean coastal defense.

128. The Tunisian-Bavarian Cooperation is supporting the **Lagune de Boughrara** project (2014-2016, 390,000 EUR) which involves the diagnosis and monitoring of the Boughrara lagoon ecosystem. The **Algues à Djerba** project (2014-2015, 350,000 EUR) includes a study of the algae problem along the beaches of Djerba.

129. ***Integration of climatic variability and change into national strategies to implement the ICZM protocol in the Mediterranean***, MedPartnership (2009 to 2014, 12.9m USD, GEF financed, executing partners are UNEP/MAP, Plan Bleu, PAP/RAC and GWP-Med) is a large marine ecosystem approach project which aims promote the use of ICZM in 12 participating countries as effective tool to deal with the impacts of Climate Variability and Change in coastal zones by mainstreaming them into the ICZM process. With SCCF funds, the proposed project will build off the following aspects of the MedPartnership:

- Component 1: using integrated approaches for the implementation of the SAPs and NAPs including Management of Coastal Aquifer and Groundwater, Integrated Coastal Zone Management (ICZM) and Integrated Water Resources Management (IWRM). Component 1 deals with having a regional consensus on appropriate data sharing for data concerned with climate variability and change. It also deals with the creation of a Multi-country Information Sharing Platform on climate monitoring data in coastal areas.
- Component 2: strengthening the knowledge base on regional climate variability and change including the development of a demonstration project in Tunisia to assess vulnerabilities-impacts & evaluate response options. The MedPartnership project focuses on building capacity of the relevant institutions in the country with tools such as DIVA for assessing impacts and "Climagine" and RiVAMP for finding solutions through participatory processes. It also plans to develop a targeted assessment of climate variability and change impacts and adaptation options for various scenarios.
- Component 3: supporting ICZM protocol implementation by providing tools and reinforcing methodologies for mainstreaming climate considerations into national ICZM planning. In this Component, an integrated management plan will be developed for a demo project site, capacity building will be provided for existing inter-ministerial coordination mechanisms and awareness raising, policy dialogue and capacity building on implications of climate variability and change on national ICZM and water policies will be provided.

130. The ***Arab Climate Resilience Initiative, ACRI*** (2012-2016, 4M USD) developed by UNDP and implemented by UNOPS: The project has three expected outputs including, 1) Institutional capacity to address climate change adaptation and mitigation strengthened, 2) Resilience to the negative impacts of climate change strengthened and opportunities to enhance the production and use of sustainable energy created and 3) Knowledge management, advocacy and awareness in countries of the Arab region on climate change adaptation, mitigation and negotiations improved. The SCCF financed project is highly aligned with the following Outputs:

- Activity Result 1.1 Capacities to access international funding mechanisms in the areas of climate change adaptation strengthened
- Activity Result 1.4, Public-private partnerships (PPPs) catalysed in the three priority areas of water and food security, sea level rise and coastal erosion and sustainable energy
- Activity Result 2.5: Capacity to identify and assess priority population groups, infrastructure and facilities vulnerable to coastal erosion and SLR strengthened

[31] http://www.enpicbcmed.eu/programme

- Activity Result 2.6: Capacity to establish monitoring systems for SLR and land subsidence strengthened

The project is also building off completed relevant projects in the following manner:

131. The ***Africa Adaptation Project*** (***AAP***, 2008-2012), funded by the Government of Japansupported 20 countries in coastal adaptation. The project objective was to reinforce the resilience of coastal development efforts that are impacted by climate change to incorporate CC risks and opportunities into their national development processes in order to protect development gains from CC. For Tunisia, the project was able to achieve 1) the elaboration of a National Coastal Adaptation Strategy, 2) the elaboration of a coastal risk vulnerability map linked to SLR, 3) the development of a concept for a coastal EWS, 4) procurement of buoys and tide gauges, 5) dune rehabilitation with ganivelles along the beaches of Korba, Gabes, Chebba and Djerba, 6) collaboration with 7 NGOs to build CC awareness. The AAP project as a first stage to this project because it was able to produce the vulnerability map which was used to choose the proposed project zones. The SCCF financed project will build on the AAP project by implementing aspects which the AAP was unable to (due to the revolution of January 2011 and associated government changes) and progressing further with coastal adaptation in the two project zones.

132. The ***MEDPRO*** (Prospective Analysis for the Mediterranean Region) project (April 2010 – March 2013, 3 m EUR) was a consortium of 17 highly reputed institutions from throughout Mediterranean funded under the EUs 7th Framework Programme and coordinated by the Centre of European Policy Studies based in Brussels. MEDPRO explored the key challenges facing the countries in the Southern Mediterranean region in the coming decade. Towards this end, MEDPRO undertook a prospective analysis, building on scenarios for regional integration and cooperation with the EU up to 2030 and on various impact assessments. A multi-disciplinary approach was taken to the research, organised into seven fields of study including energy and climate change mitigation. Eleven (11) countries were considered through the MEDPRO work including Tunisia. The Instiut Tunisien de la Competitivite et des Etudes Quantitatives, ITCEQ were a member of the MEDPRO consortium on behalf of Tunisia.

133. Investment Programme in the Water Sector (Programme d'Investissement dans le secteur de l'eau) ***PISEAU II*** (2009-2013). The objectives of PISEAU were 1) to promote more efficient irrigation for the agricultural sector, 2) improve access to water for rural populations and 3) reinforce the Ministry of Agriculture to use integrated decision-making for water resources. Concretely, PISEAU II installed surface and groundwater monitoring equipment and implemented pilot operations to support active management of over-exploited aquifers.

134. The ***Climate Change and Environment Programme, GIZ*** (2006-2011) has the objective of implementing the UNFCCC and Kyoto Protocol in the strategies and development plans for priority economic sectors. The project had three axes, 1) to support the implementation of sectoral adaptation strategies (agriculture, health, tourism), 2) to support the development of the adaptation legal framework (agriculture / resources water infrastructure / equipment, health, environment, tourism), and 3) to support the development of a concept for an early warning system (EWS) for the management of risks associated with climate extremes and climate change in Tunisia.

B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

B.1 Describe how the stakeholders will be engaged in project implementation.

135. The Stakeholders identified during project preparation (See Table 3 below) will continue to be implicated in project implementation. The following Table shows the list of consultations which took place to develop the SCCF financed project document. The project outcomes, outputs and activities are based upon the recommendations of the Stakeholders given the technical, operational and financial constraints of the project. The role and participation of each agency is indicated by the column headings described in the legend.

Column Heading Legend

National Inception Consultation – participated in national inception workshop or first mission consultations

Technical Validation Workshop – participated in the technical workshop

Validation Workshop – participated in the validation workshop
Baseline Assessment – consulted to provide baseline situation during project development
Management Arrangements – identified as a member in the project management arrangements (e.g., Steering Committee, etc)
Risk/Barrier Analysis – consulted to document their view of specific institutional risks or barriers
Policy/ Strategic alignment to priorities – institution has policies/strategies or implements policies / strategies aligned with project priorities
Co-financing Identification – institutions / organizations which have other projects or existing material to support and be supported by the project financially
Gender representation – organization which is concerned with promoting the involvement of women during project development and implementation
Upscale / Sustainability planning – responsible for scaling-up (duplicating) the project and reinforcing the sustainability of activities after project completion
Potential Partnerships – Memorandums of Understanding obtained between ministries and institutions to support project implementation

136. Table 3: Stakeholder Involvement Matrix

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale/ Sustainability planning	Potential Partnerships
Federal/Sector									
APAL	X	X	X	X	X	X		X	X
DGSAM	X	X		X	X	X		X	X
DGQEV	X	X	X	X	X	X	X	X	X
ANPE	X	X	X	X	X			X	X
Ministry of Agriculture	X	X	X	X	X		X	X	X
DGAT	X	X	X	X	X	X			X
APIP	X			X	X				X
ONTT	X	X	X	X	X			X	X
AFT	X	X	X	X	X			X	X
Ministry of Finance			X		X				X
OMMP									
Ministry of transport					X				X
ANGED			X		X				
Technical / Research Institutions									

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale/ Sustainability planning	Potential Partnerships
INM	X	X	X	X	X				X
INSTM	X	X	X	X	X			X	X
SHO					X				X
OTC					X				X
CNT	X	X		X	X				X
OSS	X	X		X	X				X
IRA	X	X		X	X				X
Private Sector									
Fédération Tunisienne des Sociétés d'Assurance (FTUZA)	X			X					
Chamber of Commerce for Industry									X
Fédération des hôtels Jerba-Zarzis	X	X	X	X		X		X	X
FTH	X	X	X	X		X		X	X
Tunisie Holiday	X	X		X		X		X	X
Dar Jerba	X			X				X	X
Hôtel Jazira	X					X		X	X

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale/ Sustainability planning	Potential Partnerships
Regional / Sector									
CRDA – Medenine	X	X			X			X	
CRDA – Ariana					X				
CRDA - Bizerte					X				
Municipalité de Houmet Souk	X	X		X	X			X	X
Municipalité de Midoun	X	X		X	X			X	X
Municipalité de Ajim	X	X		X	X			X	X
Municipalité de Kalaât EL Andalouss	X	X		X	X			X	X
Municipalit2 Ghar El Melh					X			X	
ONAS JERBA	X				X			X	
SONEDE JERBA	X	X			X	X		X	
NGOs/CSOs									
OSC Jerbienne	X	X		X	X		X	X	X
Association Djerba Ulysse	X	X		X	X		X	X	X
Association pour la sauvegarde Jerba, ASSIDJE	X	X		X	X		X	X	X

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale/ Sustainability planning	Potential Partnerships
Association scientifique Kalat Andalous	X	X		X	X		X	X	X
RANDET					X				X
TUNWET					X				X
WWF					X		X		X
2C2D					X		X		X
Donor Partners									
UNDP	X	X			X	X	X		X
JICA					X	X	X		X
Saudian Fund						X			X
World Bank					X		X		X
GIZ					X	X	X		X
FFEM							X		X
BAD							X		X
KfW						X			X

137. A Stakeholder involvement plan has been created to provide a framework to guide interaction between implementing partners and the key stakeholders, particularly end-users to validate project progress. All Stakeholders involved in the baseline self-capacity assessment will be addressed again in order to track the efficacy of Stakeholder capacity building both operationally and technically. Also, gender-focused NGOs/CSOs will conduct a gender disaggregated survey indicating the receipt of alerts and adoption of financial services by women.

138. According to the adaptation pathways approach, the first phase of the project will be to design and implement the risk assessment process which is founded on the ongoing input and consensus of key coastal stakeholders. This will ensure that assessments are carried out act as appropriate vehicles to advance sustainable adaptive action with participation and validation from key coastal stakeholders. A participatory approach is used at all key decision making junctures. The approach will be conducted as follows:

1. Step 1 – The 'Context Setting' Phase of the risk assessment involves a stakeholder workshop to:
    - Agree on overriding adaptation visions and goals
    - Select appropriate scenarios and timeframes for assessment
    - Define key elements against which risk is assessed
    - Agree on appropriate risk evaluation criteria
2. Step 2 – The 'Risk Identification' Phase of the risk assessment involves consensus building exercises to:
    - Identify a pertinent coastal asset register (targeted input from land use planning and management personnel – public and private)
    - Confirm a coastal risk register – (distribution of preliminary risk identification mapping outputs and validation workshop)
3. Step 3 – The 'Risk Evaluation' Phase of the risk assessment involves workshopping/consensus building exercises to:
    - Review the consequence and likelihood of identified risks
    - Review risk levels and assign overall risk prioritization
4. Step 4 - The 'Risk Treatment or Adaptation Assessment' Phase of the risk assessment:
    - Preliminary Adaptation Options Analysis workshop where selection of most appropriate adaptation pathways are presented to stakeholders
    - Stakeholder driven prioritization of available options to inform definition of preferred pathway for adaptive action
    - Stakeholder validation workshop where target area adaptation plans are presented and signed off on by key decision makers

139. After the risk assessment phase is completed and proposed detailed interventions are agreed upon, the communication and consultation process will take place. This process will be divided into three parts, being:

140. Part 1 – Developing a strategy and action plan;
This is the mobilization phase in the first year of the project. The details of the activities and implementation structures will be designed, partnerships for action will be forged and stakeholder engagement will focus around these design processes.

141. Part 2 – Consultation through implementation; and
This is the main implementation phase where investments will be made on the ground in the target areas and stakeholder consultation about engagement will focus on output oriented action.

142. Part 3 – Project completion and scale up promotion.

The third and final phase represents the completion of the project. The plans for scale-up and long-term sustainability of the SCCF investments will be developed. Consultation will focus on learning, bringing experience together and looking at processes for continued post-project impact.

143. Specifically, in Part 1, gender-focused NGOs/CSOs will continue to be implicated and consulted in order to ensure women are properly engaged/warned. They will also conduct the gender disaggregated survey.

144. In Part 2, public consultations will become more of an on-going exchange of information where there will be two main purposes: i) to gather information from beneficiaries and stakeholders about the impact and effectiveness of the planned coastal adaptation measures; and ii) to provide interested government and donor stakeholders and the general public with information about the progress and impact of the project as it is implemented.

145. Part 3 will be a process of ensuring completion, hand-over and long-term sustainability of the SCCF investment. Consultation will focus on bringing experiences together, sharing key lessons learnt (through the UNDP Adaptation Learning Mechanism and other forums) and looking at processes for promoting scale up of this project in order to make more coastal communities resilient to the impacts of climate change.

146. Overall the types of consultation mechanisms to be used include:

- Preparation meetings with NGOs/CSOs to be implicated;
- Initial consultation meetings in target regions to discuss appropriate adaptation measures;
- Information briefings for government and co-financing institutions on economic instruments and fund mobilization development;
- Initiation of public awareness campaign on coastal adaptation measures as well as the costs and benefits.

For more details on the Stakeholders, see Section 2.9 of the Project Document.

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF):

147. With support from SCCF, UNDP will help Tunisia undertake a paradigm shift from crisis reactive management to anticipatory climate risks management. UNDP will assist Tunisia's government, institutions, private sector and populations in making the necessary changes in existing policies and practices so as to ensure that coastal development and planning processes adjust to the new patterns of constraints and risks associated with climate change. By strengthening the resilience of coastal regions and promoting new policy options for the long term management of SLR-induced shoreline changes (including managed retreat and setback zones), the project will provide a tangible contribution to the socio-economic well-being of the country.

148. Specifically, the proposed project will generate significant socio-economic benefits to at least 150,000 coastal inhabitants of Tunisia. The project will provide for a direct investment in the robust and climate resilient adaptation measures on 22 km of the most sensitive segments of the coastline and 670 hectares of wetland of ecological importance. The measures will be carefully selected and designed based on coastal topographic profiles, type of land use and existing infrastructure, level of exposure - concentration of settlements and economic assets and range of expected SLR and related impacts.

149. By improving the sustainable management and resilience of coastal natural features (such as dunes, estuaries, aquifers and beaches) the Tourism sector will greatly benefit from SCCF financed interventions. Hotels, shops and restaurants directly employ 13,000 people in Djerba alone. Between 50 and 60 percent of these employees are women.

150. Similarly, the project will enable 500 artisanal farmers and 4,400 fishermen (many artisanal) to continue with their livelihoods and become more resilient to climate change. In Djerba an improvement in water quality in El Hachani will support sustainable fishing. Similarly, in the northwest region of the Gulf of Tunis, management of sediment transport in a manner which is aligned with pre-existing natural conditions will decrease the sedimentation and silting of the port. Fisherman will be able to recommence or continue their fishing practices with increased port access.

Furthermore, it is expected that the water recycling, conservation and management actions in Component 2 will decrease the salinization of agricultural land in the Mejerda valley and on Djerba Island. In the Mejerda valley alone, 5,000 hectares of agricultural land will have improved conditions. Overall, of the beneficiaries who will benefit from improved fishing and agricultural livelihoods, approximately 20% are expected to be women.

151. In Djerba, the project will be used to boost the resilience of women active in artisanal tasks such as cloisture fishing. The project will also target women to create nurseries so that they can cultivate native plants to be used for dune fixation and plant ridges. The plants and planting services will be sold to private residences and hotels. If the nurseries prove to be lucrative, it is likely that an existing micro-finance scheme in Tunisia will be used to scale-up nursery operations. A possible application of scaling-up will be to provide plants to Living Shoreline applications throughout Tunisia (such as in the Mediterranean) which would require kilometers of dune fixation vegetation to be planted. Such an approach will also facilitate women's access to financial services.

152. In addition, the proposed project will significantly strengthen the capability of key provinces in Gulf of Tunis, Northern coast of Tunisia and Djerba to identify, plan and implement the adaptation measures that will deliver greater welfare impacts to the local population and economic sectors. The project will considerably improve the technical capacities of the National Observatory, APAL and other associated agencies that are responsible for the coastal protection and early warning services. A range of methods and tools for coastal risk assessment, hazard mapping, oceanographic modeling and adaptation planning will be introduced and at least 150 professional staff will improve necessary skills and knowledge through series of targeted trainings.

153. Given the magnitude of the SLR challenge in Tunisia, a single grant investment, no matter how significant, will not suffice to address it fully. The project therefore will mobilize additional internal resources in the country as well as from international sources to improve the capitalization of existing funds. It will also introduce property insurance and a transferrable development credit system to drive future investments away from the vulnerable areas and make the tourism and associated infrastructure more climate compatible. The project targets to mobilize at minimum of USD 10 million for coastal adaptation from various sources, including existing environmental funds by the end of the project.

154. The UNDP Environmental and Social Screening template has been applied to ensure environmental and social safeguards are in place. According to this checklist, the project is considered Category 3a (See Annex 9). According to this categorization and Tunisian law, a more detailed Environmental Impact Assessment has been budgeted in Component 2. Also, the following environmental and social safeguards are being applied.

155. Environmental safeguards:

- Establishing vehicle access pathways which clearly designate routes to ensure no ad hoc degradation of dune areas occurs.
- Building the capacity of APAL to understand concepts of ecological sustainability and to better integrate social and community values and aspirations into engineering decisions, thereby adhering to Integrated Coastal Zone Management.
- Ensuring either the property owner(s) or government officials monitor the soft measures effectiveness in preventing erosion. This will help determine if the current strategy is working to control erosion or if the strategy needs to be adjusted to address changes in conditions. The on-going monitoring and evaluation of the living shorelines strategies will ensure that if die-out occurs, the problem will be assessed and quickly mitigated with re-vegetation.
- Implementing demonstration projects in the target areas that are visible, with accompanying community awareness raising and education campaigns which will help raise understanding of the soft approaches and how they can be as effective (or more) as structural stabilization techniques and more sustainable and cost-effective in the long-term.

156. Social safeguards:

- Consulting villages to determine "real" coastal risks which will be fed into the risk-based spatial management plans
- Facilitating feedback from marginalized populations on the appropriateness of ICZM interventions by involving community stakeholders from inception in planning to protect and restore the natural shoreline
- Educating property owners and other stakeholders on how to maintain living shorelines and monitor the progress of adaptation measures

- Knowledge sharing with international tourism operators on cost-effective best practices for coastal adaptation and coastal erosion risk management
- Financial management and literacy training for NGOs and community members who partake in coastal adaptation project implementation

B.3. Explain how cost-effectiveness is reflected in the project design:

157. The project makes the maximum use of SCCF funds by acting as a strategic next step to the African Adaptation Project which ended in 2012. The AAP's vulnerability mapping acts as the basis for site selection. Also, complementary activities which were highlighted as lacking but necessary in the AAP's final evaluation are planned to be realized in the SCCF financed project. An example is the need to find diversified methods of financing to cover the costs of adaptation to climate change on local, regional and national levels which will be achieved in Outcome 3 of the project. Similarly, due to previous support by the PEE project in deploying and operating existing coastal monitoring infrastructure, SCCF funds will be used to build APAL's capacity in assigning appropriate government budget lines for continual Operation and Maintenance.

158. SCCF funds will be the only funding source currently used to build the capacity of APAL to use a Whole of Systems approach so that soft coastal adaptation measures consider the watershed and ecosystems for a long-time frame. This knowledge will be transferred to other projects at the baseline to adopt such long term resilience building approaches. Natural functions of complex and dynamic, coastal watershed systems will be supported to achieve long term resilience. For example, coastal estuaries and bordering wetlands will be supported to act as a natural buffer, absorbing floodwaters and dissipating storm surges. Similarly, beaches will be reinforced with vegetated coastal dunes and coastal aquifers will be properly managed to reduce saltwater intrusion. Additionally, local plants and native materials will be adopted to offer cost-effective protection measures. Many of the soft protection measures can be constructed, implemented and monitored using local manpower.

159. The SCCF financed project will further ensure cost-effectiveness by building APAL's capacity to use existing coastal monitoring data (such as that collected in the PEE project) to generate risk-based spatial management plans. Although the plans will be targeted to the pilot areas, recommendations can provide possible cost-effective coastal protection measures which can be transferred to other baseline interventions due to their low-cost, exploitation of native plants and materials and relative simplicity to implement. (NGOs can be trained to stabilize dunes for instance. Contracted engineers would not be required.) Recommendations will be based on enhanced use of existing coastal monitoring data; SCCF funds will build APAL's capacity to evaluate coastal protection measures based on a range of climate scenarios.

160. All on-going and planned interventions will benefit from the updates to regulatory frameworks and to development planning tools because existing and planned coastal protection assets will be safeguarded from unsustainable development (such as within the Maritime Public Domain). Development will be limited in high risk areas as identified and noted in frameworks and policies. (High risk being where threats of flooding and erosion exist.) Construction of hard coastal protection measures, which will most likely need to be replaced due to repeated flooding and continual erosion, will be avoided. Furthermore, regulatory reform (such as with the Environmental Impact Assessment) will mandate the use of climate-resilient construction so current investments are more sustainable. Also, any planned interventions will benefit from SCCF examples on how to deter development in high risk areas (e.g., introduction of property insurance and Transferrable Development Credit systems).

161. To choose the specific sites and associated soft adaptation measures for Outputs 2.1 (Component 2), a detailed cost-effectiveness analysis has been conducted. The specific sites were chosen based on a screening analysis using the following evaluation criteria.

Does the site have the following attributes?

1. Highly vulnerable to climate change
2. Strong community leadership and social networks
3. Willingness of communities/demand by communities to try new adaptation approaches
4. Existing capacity development or investments which a potential adaptation initiative could be linked to

5. Return on investment likely to be greatest
6. Accessibility in light of the need for ongoing monitoring and evaluation

The adaptation options analysis (summarized in Annex 2a of the Project Document) is built upon a number of Focus Questions that consider:

- The identification of context-appropriate interventions;
- Evaluation of the applicability of specific interventions to address adaptation goals; and
- Prioritisation of options for further consideration by key stakeholders.

162. The Focus Questions were designed to enable comparisons between the conventional adaptation options (i.e. typically delivering a smaller range of services that are easier to quantify) with Whole of Systems based options (i.e. deliver a greater range of options that are more difficult to quantify). The output of this type of analysis is a set of recommendations for adaptation at a given intervention site to form the basis of further stakeholder consultation. At this stage of project development, a shortlist of options has been provided for each target site and an associated budget for implementation allocated. A participatory consensus driven process will be adhered to through the site specific risk assessment phase for both target sites at the outset of implementation to gain widespread validation of the indicative options selected.

163. To further enable cost-effective implementation, training programs and workshops on improving the capacity to design and maintain coastal adaptation have been consolidated. A coherent training programme was emphasized where one activity can cost effectively satisfy more than one of the needs identified, such as group training for tourism representatives on adaptation options. Also, the project will coordinate with other baseline programs which have capacity building activities in order to ensure that money is spent wisely. For instance, SCCF funds will provide training on the economics of adaptation which is complementary to similar training on national and regional levels provided by the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** initiative. The proposed project will also exploit the regional ***MedPartnership*** programme's provision of tools and methodology reinforcement for mainstreaming climate considerations into national ICZM planning.

164. Moreover, the ICZM inter-ministerial platform, which will be formed with SCCF funds, will ensure that all relevant cross-sectoral data is used in development planning. The platform will set a precedent on how to coordinate between agencies and share data relevant to coastal planning. Additionally, capacity reinforcement for APAL to generate cost benefit and economics of adaptation analyses will ensure that APAL's coastal protection recommendations minimize additional funding needed for adaptation. Maladaptation costs resulting from sunk-costs or costs of delayed decisions will be reduced, thereby freeing financial resources for additional coastal protection measures.

165. Furthermore, the chosen set of Outputs was reviewed in a validation workshop and based on Stakeholder consultations during three separate site visits. The Outputs outlined have been chosen based on their financial feasibility and have been chosen over alternative ways to address project barriers as shown in Table 4 below.

Table 4: Demonstration of Cost-effectiveness for each proposed Output indicating the project barrier addressed by each Output

OUTPUTS	Barrier Addressed	**Alternatives Considered**
1.1 Regulations and enforcement mechanisms governing coastal land use and EIA strengthened to include climate risks management requirements, with a particular focus on siting and construction of infrastructure and tourist facilities	Existing coastal development planning and regulatory frameworks do not support anticipatory and integrated management of climate change risks	**Alternative 1:** Rely on existing legal and regulatory frameworks; however these frameworks are not adapted to facilitate coastal adaptation and to deter development in vulnerable zones. They also do not consider future projections of sea level rise and associated impacts.
1.2 Advanced coastal risk assessment and adaptation economics tools for planning introduced at 4 planning authorities (APAL national and 2 regional branches, Bureau of Tourism and the regional governments) delivered to 200 key technical staff and decision makers for them to understand and respond to the impacts of climate change induced risks/disasters on coastal infrastructure, economies	Limited expertise and knowledge of various risk assessment and decision support tools for adaptation planning, early responses and/or medium-term to long-term risk management	**Alternative 1:** Use only average SLR scenario (1m by 2100). This does not facilitate a timed, prioritized approach to adaptation or provide an adequate platform for flexible adaptation pathways to be implemented. **Alternative 2:** Develop costs and benefits of adaptation options within each agency/Ministry: In order to optimize management plans, cross-sectoral coordination and information sharing is required. Data must be exchanged to develop true costs and benefits which reflect the range of socio-economic and environmental benefits for all options. **Alternative 3**: One-time training on the economics of adaptation: This project will train, in a staged manner, representatives from various ministries in accordance with the Global Water Partnership. Budget has therefore been allotted to provide periodic training.

OUTPUTS	Barrier Addressed	Alternatives Considered
and livelihoods		
1.3 Hardware and software delivered to improve observation capacities, data collection and treatment (topographic and bathymetric surveys, MIKE11 flood and coastal surge modelling software and SEDSIM, Fortran for sediment process modelling)	Limited expertise and knowledge of various risk assessment and decision support tools for adaptation planning, early responses and/or medium-term to long-term risk management	**Alternative 1**: Have separate data portals for each agency to ensure security: however, this would prohibit the easy use of data across agencies. **Alternative 2:** Acquiring more equipment: This project is focusing on effectively using data rather than on excessive equipment procurement. Existing coastal data is generally of sufficient quality to update impact analyses and risk-based spatial management plans (as evidenced by the comprehensive vulnerability map produced in the AAP project in 2012). Relevant ministries require capacity reinforcement on how to use this data appropriately and how to coordinate with other ministries to integrate relevant information to support ICZM.
1.4 In at least 2 vulnerable coastal regions and municipalities (Northern coast of Tunisia and Djerba), spatial plans (Agenda 21, PAU) developed based on impact scenarios, shoreline management planning and cost-benefit analysis of adaptation options	Existing coastal development planning and regulatory frameworks do not support anticipatory and integrated management of climate change risks	**Alternative 1:** Do nothing. The existing approach involving reactive treatment of impacts will continue in-country to the detriment of naturally functioning coastal processes and healthy sustainable ecosystems with their associated service provisions. Medium and long term impacts of climate change will not be considered and vulnerability will increase across key sectors (tourism, agriculture, fisheries, water). **Alternative 2:** Rely on the existing National Tourism Strategy 2016 to move development inland: By nature of Tunisia being dependent on port trade, development disincentives are required to deter unsustainable development along the coast. The Island of Djerba is already at maximum capacity so the creation of a new system to be managed locally, can incentivize development away from the Maritime Public Domain. Through SCCF funds, municipalities in the 2 project zones will build capacity on the concept of Transferrable Development Credits. This new development incentive idea has shown much success in other countries (e.g., USA) and will be tested in the SCCF financed project.
2.1 Shore protection practices and technologies to mitigate long-term risks from SLR introduced in the region northwest of the Gulf	Limited understanding of a Whole of Systems approach as a means to address current and anticipated climate	***See separate analysis for a summary of discrete alternatives considered at each target site, Annex 8 in the Project Document.***

OUTPUTS	Barrier Addressed	**Alternatives Considered**
of Tunis and on Djerba island	related risks in the coastal regions Limited Monitoring and Evaluation (M&E) of coastal protection interventions	**Alternative 1**: Use hard measures alone. The existing issues with coastal degradation continue as the indiscriminant use of hard structural techniques causes disruption of natural coastal processes (e.g. loss of beach adjacent to shore-perpendicular works such as groynes; loss of sediment in areas on front of seawalls; decrease in water quality within enclosed breakwater systems). **Alternative 2**: Use soft measures in an ad hoc manner without integration in a wider programme of sustainable, coastal management that adopts a systems approach and acknowledges the importance of healthy functioning ecosystems and the services they provide. The introduction of soft measures at a target site may work to treat the current management problem at that specific location. However, it is unlikely that the intervention will be sustainable in the medium to long term unless it occurs as part of a wider attempt to manage the coastal system. In addition, 'point' application of an intervention that fails to consider the functioning of the system as a whole may result in negative impacts for adjacent coastal areas (e.g. encouraging sediment capture and storage at one location may treat an existing erosion problem at that site but cause increased erosion up or down drift). **Alternative 3:** Use soft measures within an Integrated Coastal Zone Management (ICZM) framework that does not incorporate a consideration of climate change risks at a range of timeframes and scenarios. These management efforts will facilitate good practice in terms of dealing with current pressures but do not build a platform for sustainable solutions with a medium to long term horizon. Coastal management that includes a blanket 'factor of safety' in an attempt to cater for future climate related impacts runs the risk of over adaptation or maladaptation which is at odds with the accepted benefits of flexible adaptation pathways that can help to manage the long-term and uncertain nature of climate change impacts. The approach uses risk-based decision frameworks involving thresholds and trigger points for making systematic adjustments in response to new information and changing circumstances. It employs robust adaptation actions in a timed manner that work across a wide range of circumstances both now and in the future (as opposed to those that are optimised for present-day conditions or a single future outcome that ignores uncertainty).

OUTPUTS	Barrier Addressed	**Alternatives Considered**
2.2 Improved water management and savings practices for coastal fresh aquifer resources implemented in both project zones to prevent saltwater intrusion resulting from SLR	Limited understanding of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions	**Alternative 1**: Rely on hotels to be self-motivated to conduct water recycling and desalination measures: Only a few hotels have tried to manage water resources so that less potable water is wasted and more saltwater is desalinated. The incentive for these limited hotels has been the economic benefit. SCCF funds are planned to develop guidelines for best practices on water management in hotels from an economic and environmentally-friendly perspective. Hotels are more likely to accept new water management practices if an in-depth economic and technical study is provided to them which clearly indicates the best options. **Alternative 2:**.Continue irrigating in the current fashion: Tunisia's agricultural sector uses over 80% of the fresh water supply. Farming methodologies are water intensive. A study on the potential of irrigation by non-conventional water (treated and/or desalinated wastewater) is necessary in both sites to find appropriate water-saving irrigation methods.
2.3 Technical capacities, institutional functions and associated budgets in place at the APAL and municipalities including NGOs/CSOs for the maintenance, monitoring and expansion of the introduced shore protection and coastal adaptation practices	Limited understanding of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions Limited Monitoring and Evaluation (M&E) of coastal protection interventions	**Alternative 1**: Rely on the end result of pilot projects to ensure replication: Soft adaptation measures require significant Monitoring and Evaluation to be able to track sediment balances, water quality and other quantitative indicators. Currently, APAL is not systematically recording quantitative indicator data to detect soft protection measure failure so as to establish appropriate benchmarks to monitor change or collect appropriate data through the establishment and ongoing implementation of the intervention mean that positive contributions are difficult to quantify. Conversely, monitoring may be attempted in some instances (e.g. Ganivelles established through the AAP project in Djerba) but data and information not evaluated in a robust or timely fashion. **Alternative 2:** Business As Usual for oceanographic monitoring equipment (one time investments): Ocean monitoring equipment must be relatively robust and technical personnel must be able to fix equipment in the field. Operation and maintenance costs are significant for wave and tide monitoring equipment because of the extreme conditions in which they monitor (salt corrosion, extreme winds and wave energy). Capacity must be built within APAL to have sufficient budget lines to support continual O&M including the provision of spare parts.
2.4 Coastal risk monitoring	Limited understanding	**Alternative 1**: Rely on existing interventions to support coastal early warnings: Although

OUTPUTS	Barrier Addressed	**Alternatives Considered**
and early warning mechanisms focusing on SLR-induced erosion, urban flooding designed and introduced	of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions	APAL works with a regional center for early warning on Tsunamis, it does not have the capacity to predict more local extreme weather events such as flooding and coastal storm surges. Data is not shared effectively with the National Weather Service to produce useful forecasts. Most importantly, there is no standard communication protocol which details how information producers should interact to produce alert for coastal regions and how to disseminate the alert to the Navy National Guard, beacons and lighthouses, etc.
3.1 Investment mechanisms for community based coastal adaptation developed and initiated in both project regions with participation of key tourism operators (Djerba) and farmers (Northwest of Gulf of Tunis)	Inadequate means to mobilise funds for risk-reducing and adaptation activities on public and private levels	**Alternative 1:** Continue implementing coastal protection measures without shared management and guidance: Hotels are implementing the incorrect coastal protection measures (e.g., loss of beaches adjacent to shore perpendicular measures such as groynes as well as ill-conceived breakwater structures that have created problems with poor water quality and degradation of beach amenity). It is well-established that developing private public partnerships is a good method to ensure sustainability of actions past donor project completion. The private hotel sector is unaware of appropriate coastal adaptation techniques whereas many NGOs, particularly in Djerba are environmentally-conscious can help with adaptation measure implementation under the guidance of APAL. **Alternative 2**: Cash for work: This concept has not worked successfully in Tunisia. It also does not provide a sense of ownership.
3.2 Innovative financing instruments introduced and existing funding mechanisms enhanced from national and international sources to support coastal adaptation	Inadequate means to mobilise funds for risk-reducing and adaptation activities on public and private levels	**Alternative 1:** Business as usual, existing funds acting in parallel: The numerous environmentally-focused funds have no power or know-how to access national funds and expand financing mechanisms to include support from donors. By organizing these funds together in and Environmental Fund Management System, a national finance expert can properly capitalize the funds with a diversified portfolio of investing techniques. **Alternative 2**: Use existing governing mechanisms for national financing schemes: As the Tunisia Report for the Conference on Sustainable Development (Oct 2011) indicated, Tunisia suffers from corruption and a lack of transparency for financial transactions. As the Transparency International: Global Corruption Report (2011) recommends, transparent governing mechanisms are required to ensure there is accountability with fund management.
3.3 Insurance and property	Inadequate means to	**Alternative 1:** Weather index based insurance: Weather index-based insurance is

OUTPUTS	Barrier Addressed	**Alternatives Considered**
development credits that provide effective risk sharing and risk reduction incentives in coastal built environments designed and introduced amongst 500 highly exposed businesses and households	mobilise funds for risk-reducing and adaptation activities on public and private levels	preferred when there is a measurable threshold that is surpassed to trigger payouts. However, Sea Level Rise is gradual and measured only over long time periods and has not been able to be included in existing WII products. WII products are generally best applied in situations when weather sets off a trigger. For instance, WII is appropriate for an agricultural scheme when flooding or drought occurs and can easily be measured by weather stations and satellite data.

C. DESCRIBE THE BUDGETED M &E PLAN:

The project will be monitored through the following M&E activities. The M&E budget is provided in the table below. The M&E framework set out in the Project Results Framework in Part III of this project document is aligned with the AMAT and UNDP M&E frameworks.

Project start: A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and program advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The **Inception Workshop** should address a number of key issues including:

- Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and Regional Coordinating Unit (RCU) staff (i.e. UNDP-GEF Regional Technical Advisor) vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- Based on the project results framework and the SCCF related AMAT set out in the Project Results Framework in Annex A of this project document, and finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- Plan and schedule Steering Committee meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Steering Committee meeting should be held within the first 12 months following the inception workshop.

An **Inception Workshop report** is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS.

  Risks become critical when the impact and probability are high. Note that for UNDP/GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs will be used to monitor issues, lessons learned. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually: Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR

Periodic Monitoring through site visits: UNDP CO and the UNDP-GEF region-based staff will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle: The project will undergo an independent Mid-Term Review at the mid-point of project implementation (expected to be in February 2017). The Mid-Term Review will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term review will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term review will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit (RCU) and UNDP-GEF. The LDFC/SCCF AMAT as set out in the Project Results Framework in Annex A of this project document) will also be completed during the mid-term evaluation cycle.

End of Project: An independent Terminal Evaluation will take place three months prior to the final PB meeting and will be undertaken in accordance with UNDP-GEF guidance. The terminal evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term review, if any such correction took place). The terminal evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The LDFC/SCCF AMAT as set out in the Project Results Framework in Annex A of this project document) will also be completed during the terminal evaluation cycle. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

Learning and knowledge sharing: Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

There will be a two-way flow of information between this project and other projects of a similar focus.
Audit: This project will be audited in accordance with UNDP Financial Regulations and Rules and applicable audit policies.

Table 5: Project Monitoring and Evaluation Work Plan and Budget

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	▪ Project Manager ▪ PIU (Project Implementation Unit) ▪ UNDP CO, UNDP GEF	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. ▪ PIU, esp. M&E expert	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	▪ Oversight by Project Manager ▪ PIU, esp. M&E expert ▪ Implementation teams	To be determined as part of the Annual Work Plan's preparation. Indicative cost is 20,000	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project manager and team	None	Quarterly
Mid-term Review	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 40,000	At the mid-point of project implementation.

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Terminal Evaluation	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 40,000	At least three months before the end of project implementation
Audit	▪ UNDP CO ▪ Project manager ▪ PIU	Indicative cost per year: 3,000 (12,000 total)	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly for UNDP CO
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 122,000 (+/- 5% of total GEF budget)	

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):): (Please attach the Operational Focal Point endorsement letter(s) with this form. For SGP, use this OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE*(MM/dd/yyyy)*
Sabria Bnouni Ben Ammar	GEF Operational Focal Point	Ministry of Equipment, Land Planning and Sustainable Development	08/17/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	**Signature**	**Date *(Month, day, year)***	**Project Contact Person**	**Telephone**	**Email Address**
Adriana Dinu, UNDP – GEF Executive Coordinator and Director a.i.		July 21, 2014	Keti Chachibaia, Regional Technical Advisor	+66 (0) 2304 9100	keti.chachibaia@undp.org

ANNEX A: PROJECT RESULTS FRAMEWORK(either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:

CPAP OUTPUT: Not applicable, CPAP still being drafted

Country Programme Outcome Indicators:

Number of regional development plans elaborated which integrate land use specifications and environmental aspects

Primary Applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):

1.4.1 Number of countries with systems in place to access, deliver, monitor, report on and verify use of climate finance

1.4.2 Number of countries with comprehensive measures – plans, strategies, policies, programmes and budgets – implemented to achieve low-emission and climate-resilient development objectives

Applicable GEF Strategic Objective and Program:

Objective 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level

Applicable GEF Expected Outcomes:

Outcome 2.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas
Outcome 2.2: Increased adaptive capacity to climate change in development sectors
Outcome 3.1: Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures

Applicable GEF Outcome Indicators:

- Number and type of development frameworks that include adaptation measures
- Number and type of natural resource assets created, maintained or improved to withstand conditions from climate variability and change
- Number and type of development frameworks and sectoral strategies that include specific budgets for adaptation actions

	Indicator	**Baseline**	**Targets** **End of Project**	**Source of verification**	**Risks and Assumptions**
Project Objective[32]	1.Amount of public funds mobilised to support coastal	Tunisia's 2008 SNC coastal study indicated that the economic impact of climate change related SLR on	1.TARGET: By the end of the project, a	1.Government budget lines committed to	ASSUMPTION: The Government of Tunisia has enough incentive to mobilise

[32]*Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

To promote innovative adaptation strategies, technologies and financing options to address the additional risks posed by climate change on populations and key socio-economic sectors in Tunisia's most vulnerable coastal areas	adaptation 2.Djerba:Percentage of coastal hotels working in cooperation with local municipalities to implement locally-sourced, naturally available soft protection measures (e.g., sea grass and sand	agriculture and tourism is expected to cost 0.63% of the GDP/year, or approximately US$1 billion. The current national coastal protection budget is limited at 10.4 m USD. This budget is being used to support site-specific projects, using predominantly hard engineering interventions, to reduce coastal erosion. Current interventions do not consider the use of an integrated approach to adapt to climate change (e.g., holistic watershed thinking or a Whole of Systems approach). 1. BASELINE: Limited domestic financing mechanisms for coastal adaptation exist and no financing exists on regional and local levels Furthermore, the issues of coastal erosion, submersion, salinization and flooding are exacerbated by a limited number of applied coastal adaptation responses which take into account the long-term implications of CC. Diversified, locally-sourced and environmentally-friendly coastal protection technologies are required.	disbursement of at least 10 m USD is accrued from public sources and earmarked for coastal adaptation 2. TARGET 50 coastal hotels in the targeted areas implementing soft protection measures in alignment with recommended adaptation options outlined in Djerba's risk-	coastal adaptation 2.APAL monitoring logs of soft, coastal adaptation measures in Djerba	funds which can be effectively targeted towards coastal adaptation activities in a transparent manner with appropriate financial management ASSUMPTION: There is sufficient technical capacity within APAL for successful execution and implementation of the project RISK; Water and coastal management strategies are made ineffective by an unanticipated increase in the frequency of flood events and drought which jeopardizes coastal protection and water conservation measures RISK: Insufficient institutional engagement and coordination may prevent successful project delivery in

	layering)	2. BASELINE: Only four hotels are employing soft protection measures to support coastal erosion (ganivelles and geotubes). However, such soft interventions are being made ad-hoc without an idea of upstream hydrological, ecological and geomorphological processes.	based spatial management plan (Component 1)		the current transitional context in Tunisia

	Indicator	**Baseline**	**Targets** **End of Project**	**Source of verification**	**Risks and Assumptions**
Outcome 1 Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved	1.Number and type of policy or legal frameworks informed by coastal dynamic modelling and adopted to account for coastal risks	1. BASELINE Currently, in Tunisia there have been no concrete steps taken to incorporate climate change (CC) risks into policy and legal frameworks governing coastal management. Spatial planning regulations, building codes and Environmental Impact Assessments do not consider anticipated impacts of CC and erosion and flooding risks on the built environment, especially in tourism districts. Current rules for setbacks for coastal development are not based on site-specific assessments and do not consider well-established risk (e.g., Sea Level Rise, SLR).	1. TARGET: at least three pieces of regulation governing coastal management (such as, the Maritime Public Domain (DPM), Environmental Impact Assessment (EIE), the Code of Planning and Urban Development (CATU) and the new Environment Code) updated to consider SLR, erosion and coastal flooding in their policies / legal frameworks	1. Review of the DPM, EIE, Code d'Environnement and the Code de l'Aménagement du Territoire et de l'Urbanisme (CATU)	ASSUMPTION: Institutions have the will and ability to engage in long-term planning to mitigate potential coastal risks ASSUMPTION: Relevant Ministries have a vested interest to fully integrate coastal adaptation strategies into their long-term planning
	2. Creation of a national ICZM inter-ministerial platform to	2. BASELINE Although Tunisia ratified the Barcelona Integrated Coastal Zone Management (ICZM) protocol, implementation of the	2. TARGET: Creation of a national ICZM inter-ministerial platform to coordinate projects,	2. Review on the coordination of agencies conducting ICZM	

	facilitate the coastal adaptation	ICZM in terms of actions has been slow. Currently, the regional MedPartnership programme is trying to integrate CC into national strategies to begin implementation of ICZM in Tunisia. However, there have been no on-the-ground implementations of ICZM. The Ministries are also not collaborating with the National Shore Protection and Planning Agency (APAL) when they are implementing coastal development activities. Tunisia therefore lacks a mechanism to coordinate projects, strategies and programmes involving the coastal zone on the national and regional levels. (Other regional level ICZM initiatives in the Mediterranean include the Global Water Partnership, PEGASO and UNESO-IHP.)	strategies and programmes involving the coastal zone on the national and regional levels and to facilitate decision-making on sustainable and climate resilient coastal development	projects/programmes	
	3.Number of risk-based spatial management plans used by the Municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis	3. BASELINE Through the local Agenda 21 approach already applied in Tunisia, community informed sustainable planning is possible. However, a renewed local Agenda 21 which considers up to date coastal risks (erosion, SLR, flooding) is lacking in both sites of the project. Stakeholders have not been consulted about the current potential coastal risks in their region because there is no available risk planning tool to facilitate the application of options for ICZM and to develop site specific design criteria for sustainable	3. TARGET: 1 risk-based spatial management plan developed for the Municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis detailing prioritized, cost-effective ICZM and adaptation strategies / flexible pathways, targeting the agricultural sector (northwest coast of the Gulf of Tunis site)	3. Land management plan updates (Local Agenda 21) for the municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis	

		development including appropriate adaptation strategies and flexible pathways.	and the tourism sector (Djerba)		
Outcome 2 Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 22 km of coast and 670 hectares of wetland and benefiting 150,000 inhabitants	1. Number of soft adaptation measures implemented which improve coastal conditions by increasing resilience to absorb change as measured by the following: • Length of coast preserving public open space and natural ecosystems • Area of wetlands with improved ecological conditions • Length of coast with stable dune fixation • Number of kilometers of living shorelines implemented • Percentage increase in hotels and agricultural	1. BASELINE: Existing baseline actions and projects, such as under APAL's National Coastal Erosion Protection Programme, the ICZM project, and the KFW project consist mainly of reactive, end-of-pipeline solutions such as artificial sand nourishment and 'hard' protection measures (e.g., shore embankment, breakwater construction). Although the MedWetCoast project offered encouraging sand dune rehabilitation results, rehabilitation solutions are not cost-effective because required materials must be imported. Similarly, APAL's experience with the installation of geotextile tubes in the El Mezraya zone indicated that materials are too fragile. Presently, 5 soft coastal protection and water management measures have been implemented in Djerba Ganivelles, dune stabilisation with native grasses, geotextile tubes, wind-breaking fences, water recycling and purification practices in some hotels)	1. TARGET: • Djerba: Length preserving 10 km of coast public open space and natural ecosystems • Both sites: 670 hectares of wetlands with improved ecological conditions • Both sites: 20 Km of successful dune fixation • Ghar El Melh: 2 kilometres of living shorelines implemented • 5% increase in hotels and agricultural land which use recycled water	1. Design and construction logs housed at APAL; National Tourism Board and Ministry of Agriculture records on the use of recycled water in hotels and on agricultural land in Djerba and in the Northwest of the Gulf of Tunis	ASSUMPTION: Initial coastal vulnerability studies and technical assessments are accurate in their predictions of coastal impacts RISK: Works associated with coastal protection lead to unanticipated environmental impacts (e.g., eutrophication)

	land which use recycled water				
	2. Establishment of a Monitoring and Evaluation (M&E) database with qualitative and quantitative indicators of soft coastal adaptation measures which contributes to the central coastal databank (SIAD)	2. BASELINE: No M&E system exists for adaptive coastal management: In spite of 13 years' experience with coastal preservation projects, the National Shore Protection and Planning Agency (APAL) lacks technical and operational capacity to measure adaptation in accordance with ICZM. Coastal developments have been evaluated based on photographs and not any quantifiable indicators that dictate long-term success. Also, APAL's developments themselves have been along limited reaches of coast, not accounting for interactions with the surrounding watershed and ecosystems.	2. TARGET: Establishment of a M&E database with qualitative and quantitative indicators of soft coastal adaptation measures which contributes to the central coastal databank (SIAD)	2. Observation/monitoring logs Annual M&E surveys; Project mid-term and terminal evaluations.	
	3.Number of tide gauges and buoys installed to support coastal risk monitoring	3.In response to direct and indirect impacts from extreme weather conditions, the government has put an early warning system high on its agenda. Along the coast, alerts are planned to be used for seismic disturbances (tsunamis), flooding, coastal surges, strong winds and marrobbios[33]. As a first step towards improved observation and forecasting capacity, the Ministry of Agriculture and Environment	3. TARGET: Three (3) tide gauge and 1 buoy to be procured and installed.	3. Review of APAL's procurements for coastal monitoring	

[33] Waves caused by rapid and unusual changes in atmospheric pressure in confined areas

		with support from the GIZ Climate Change Assistance Programme, developed a concept plan for a national climate change multi-hazard monitoring and early warning system. Some initiatives such as the Environment Energy Programme (PEE) and the Africa Adaptation Programme (AAP) (described in Section A.7) have provided coastal monitoring equipment to support alert generation. In spite of some point locations for observation and monitoring, the alerts and products from the regional center are not downscaled to suit Tunisia and updated by Tunisia specific observations. 3. BASELINE: 4 buoys and 2 tide gauges procured and installed through the AAP project. 4 buoys procured and installed through the PEE project.			
Outcome 3 Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven coastal adaptation measures	1. Publication of long-term financing strategies to guide APAL in how to mobilize funds for coastal adaptation	Tunisia's 2008 SNC Coastal study indicated that the total cost of adapting to a 0.5 meter SLR is approximately US$1 billion. The Government of Tunisia currently has no financial mechanisms to cover the costs of SLR and erosion. Moreover, due to the difficulty in demonstrating cost-effective climate compatible measures to reduce water stress and impacts on coastal settlements, the Government does not have the knowledge on how to properly	1.TARGET Publication of at least 1 long-term financing strategy to guide APAL in how to mobilize funds for coastal adaptation	1.Financing plan at the ministry level (Ministry of Equipment, Land Planning and Sustainable Development) earmarked for coastal adaptation	ASSUMPTION: Institutions working in coastal adaptation have sufficient capacity and incentive to mobilise and manage funds and new economic instruments for coastal adaptation RISK: Insurance

		attract public and private financial mechanisms to support long-term coastal needs. 1. BASELINE: No strategies which provide guidance on how to mobilise funds for coastal adaptation			companies are not willing and incentivized to study the feasibility of adapting disaster risk insurance RISK: NGOs/CSOs do not have sufficient financial literacy to manage small revolving fund or micro-grants for small-scale coastal adaptation projects
	2. Percentage of APAL's budget provided to community members (including NGOs/CSOs) so that they can finance community-based coastal adaptation measures	2. BASELINE: Community-run coastal adaptation projects (with the support of local NGOs/CSOs) have had much success in Tunisia. During the Africa Adaptation Project (AAP) 7 NGOs developed Adaptation Action Plans with the goal of promoting climate change awareness. In spite of the solid collaboration between APAL and NGOs/CSOs, investment mechanisms to support community-based adaptation are limited in Tunisia. Consequently, there are no financial mechanisms to support sustainability of coastal adaptation activities in the long-term. NGO/CSO engagement in coastal rehabilitation is hindered by their lack of financial resources.	2. TARGET 2% of APAL's budget supports community members or members of NGOs/CSOs to implement small adaptation projects (e.g., nursery development, sand dune fixation, etc.)	2. Funds available to NGOs/CSOs for coastal adaptation	

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

RESPONSE TO

GEF Secretariat Review Sheet for Full/Medium-sized Projects

Country/Region: Tunisia

Project Title: Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia

GEF ID: 5105

GEF Agency: UNDP

GEF Agency ID: 4697

Type of Trust fund: SCCF

GEF Focal Area (s): Climate Change

GEF-5 LDCF Objective (s): CCA-2; CCA-3

Project Grant: USD 5,500,000

Co-financing: USD 81,030,000

Agency Contact Person: Keti Chachibaia

Questions by GEF Secretariat	Comment by GEF Secretariat	Response by Proponents
16. Is there a clear description of: a) the socio-economic benefits, including gender dimensions, to	Yes for PIF stage. The project focuses on highly populated and economically vital coastal areas in Tunisia. In order to make necessary adjustments in existing coastal policies and practices, government institutions, private	The project plans to target at least 50% women. As women are equally vulnerable to coastal climate change impacts and they are active in artisanal tasks such as cloisture fishing, the project will be used to boost their resilience. The project will target women to create nurseries to cultivate native plants which will be used for dune fixation and other soft coastal protection measures.

be delivered by the project, and b) how will the delivery of such benefits support the achievement of incremental/ additional benefits?	sector and populations will be provided with necessary assistance. At least 150,000 coastal inhabitants will benefit from the project. However role of the communities and specifically, role of women in the targeted private and public sectors is not clear. Recommended Action by CEO endorsement: Please provide information on the project aspects that will specifically address needs of vulnerable groups especially women. Also provide information on community involvement in the project.	The plants and planting services will be sold to private residences and hotels. If the nurseries prove to be lucrative, it is likely that an existing micro-finance scheme in Tunisia will be used to scale-up nursery operations. A possible application of scaling-up will be to provide plants to Living Shoreline applications throughout Tunisia (such as in the Mediterranean) which would require kilometers of dune fixation vegetation to be planted. Such an approach will also facilitate women's access to financial services. On the local level, municipalities and NGOs/CSOs will gain capacity to implement and monitor coastal adaptation projects. There are 3 active NGOs in Djerba, 2 active NGOs in the northwest zone of the Gulf of Tunis as well as 3 nationally based NGOs which have been involved in the project preparation. SCCF funds will provide training on Integrated Coastal Zone Management (ICZM) to 35 members from these NGOs. Municipalities will also gain knowledge on appropriate coastal adaptation options as determined by cost-benefit analyses in Component 1 and how to mitigate or deter future development in designated vulnerable zones with the support of activities in Component 3 (e.g., the introduction of a Transferrable Development Credit System). The training recipients are listed in the Table below:

Parties prenantes	**Régional Jerba**	**Régional Kalat El Andalous**	**Régional Bizerte (Ghar El melh)**
Municipalité de Houmet Souk	5		
Municipalité de Midoun	5		
Municipalité de Ajim	5		

Municipalité de Kalaât EL Andalouss		5	
Municipalité Ghar El Melh			5
ONG,	20	5	10
Total	35	10	15
Total Général	**60**		

Furthermore, Component 3 of the project will provide approximately USD 100,000 in joint grants to hotel and NGO/community collaborations for the implementation of localized, coastal adaptation projects. The idea stems from the fact that during project development, Stakeholders indicated that locally-based NGOs/CSOs are experienced and motivated to implement small coastal adaptation projects (e.g., as shown in the Africa Adaptation Project). Also, site visits indicated that, due to their lack of knowledge of sustainable practices, hotels are implementing their own mal-adaptive measures to combat coastal erosion.

Joint collaborations will be used to improve coordination between the tourism and public sectors so that they can begin to work together to sustainably manage the coastal zone. The joint grant system will promote shared management and leverage the private sector to create an enabling environment for adaptation activities in the long-term.

By providing joint grants, the tourism industry will be incentivized to apply the optimal cost-effective adaptation options to be provided by the guidance package to be created in Component 1. (The package will include a series of evidence-based recommendations for the tourism sector to ensure flood and

		erosion protection of the physical infrastructure in compliance with spatial plan and coastal zoning regulations.) The use of locally-sourced, environmentally friendly materials to protect beaches (e.g., posidonia-sand layering) will most likely be one of the recommended options. Such an option can be fully supported by the joint grants because the NGOs/CSOs or community groups can provide the local manpower to implement this simple beach re-building measure. The joint grant concept thus fully supports Tunisia's goal to support Integrated Coastal Zone Management because Stakeholders, both public and private, will be mandated to work together in order to receive financing. At the same time, the joint grants will support local coastal management which when demonstrated in pilot sites, can easily be replicated in future applications in other vulnerable coastal areas, past project completion. The joint grant funds will also be used to support NGOs/CSOs and community groups to have appropriate tools to implement soft coastal protection measures such as sand-trapping fences (palisades, ganivelles). APAL will provide NGOs/CSOs with training on coastal protection measures. Money will be granted based upon selection criteria which will demonstrate that NGOs/CSOs/community members have a good track record with implementing and managing projects. Similarly, hotels will be selected based on their motivation to work with community members and their willingness to try innovative, sustainable and integrated coastal protection approaches. To reinforce the capacity of NGOs/CSOs and community groups to implement localized projects, they will receive training in financial literacy and cash management. Furthermore, during project implementation, another option to be evaluated will be to fund and revitalise existing small grant programmes for NGOs/CSOs on the local level to conduct coastal adaptation projects in the long-term.
17. Is public participation,	Yes for PIF stage. Involvement of national level institutions and their roles are clear.	In Component 1, NGOs/CSOs will be recognized members of the national ICZM (Integrated Coastal Zone Management) inter-ministerial platform which

including CSOs and indigenous people, taken into consideration, their role identified and addressed properly?	However, the role of the communities and organizations in different project components and their level of engagement is not clear. Recommended Action for CEO Endorsement: Please provide details on roles the local communities and organizations have in the project components.	will be used to coordinate projects and strategies involving the coastal zone. In Components 2 and 3, the communities will be responsible for implementing and monitoring localized coastal protection measures. As described above, joint grants will be provided to NGO/CSO/community and hotel collaborations to implement soft coastal adaptation measures. In Component 3, SCCF funds will also be used to fund community nursery development (with an emphasis on nurseries managed by women) to provide a supply of local vegetation which will be used to support dune fixation, Living Shoreline development and other soft coastal protection measures. Furthermore, in Component 3, the Green Economy Initiative will facilitate a future PPP for Djerba Island by supporting a potential green economy / green industry with an initial market study on the feasibility of using locally-sourced palmivelles as a form of fencing to capture wind-driven sand. The idea is to support the SCCF community beneficiaries by creating jobs locally which have the dual benefit of supporting coastal protection. For more information on the roles of communities and organisations, please see the response to comment #16 above.
18. Does the project take into account potential major risks, including the consequences of climate change and provides sufficient	Yes for PIF stage. Insufficient institutional engagement and resistance among stakeholders are stated as main risks and appropriate mitigation measures for the PIF stage are given. Recommended Action for CEO Endorsement:	As delineated in Section A.6, RISK: Emphasis on shared coastal management and coordination between private hotels and NGOs and/or the municipality is hindered because of self-interests and contrasting agendas The joint grants will facilitate collaboration between the tourism sector and

risk mitigation measures? (i.e., climate resilience)	Please investigate risks associated in achieving adequate community involvement, conducting cost benefit analysis and proof of viability of alternative measures of coastal protection.	community groups. The hotels, who are already implementing coastal "protection" measures out of their own self-interest, and community groups will receive guidance from APAL on the most cost-effective and sustainable coastal protection measures. Through Component 1 sophisticated cross-sectoral, cost-benefit analyses will be conducted (employing adaptation economics and real options assessment principles) which will be used to generate a guidance package on optimal coastal protection measures. With training from APAL and financial support from SCCF funds, local NGOs/CSOs/community groups will become capable and can act as locally-sourced manpower to implement coastal protection interventions for both public and private beaches. RISK: NGOs/CSOs do not have sufficient financial literacy to manage funds for small-scale coastal adaptation projects The third component includes training for NGOs/CSOs by a national financial expert so that they can manage SCCF funds for small coastal adaptation projects. Also, one selection criterion to choose NGOs to implement coastal adaptation project will include the demonstration of a good track record in implementing and managing projects. Furthermore, alternative measures for coastal protection have been analysed in detail. As shown in Section B.3, for each Output, Alternatives have been weighed. Furthermore, a detailed cost-effectiveness analysis has been conducted to choose the specific sites and associated soft adaptation measures for Output 2.1 (Component 2) (See Annex 8 in the Project Document). The specific sites were chosen based on a screening analysis using the following evaluation criteria. Does the site have the following attributes? • Highly vulnerable to climate change • Strong community leadership and social networks • Willingness of communities/demand by communities to try new adaptation approaches

		• Existing capacity development or investments which a potential adaptation initiative could be linked to • Return on investment likely to be greatest • Accessibility in light of the need for ongoing monitoring and evaluation The adaptation options analysis (summarized in Annex 8 of the Project Document) is built upon a number of Focus Questions that consider: • The identification of context-appropriate interventions; • Evaluation of the applicability of specific interventions to address adaptation goals; and • Prioritisation of options for further consideration by key stakeholders. The Focus Questions were designed to enable comparisons between the conventional adaptation options (i.e. typically delivering a smaller range of services that are easier to quantify) with Whole of Systems based options (i.e. deliver a greater range of options that are more difficult to quantify). The process for interpreting and weighting this type of options evaluation will be ultimately stakeholder driven and tied to the overriding aims and objectives of the adaptation initiative.
19. Is the project consistent and properly coordinated with other related initiatives in the country or in the region?	Yes for PIF stage. The proposal outlines in detail coordination with another UNDP project on coastal development. Recommended Action for CEO Endorsement: Please provide similar details on collaboration opportunities with other agencies and NGOs activities identified in the proposal.	As described in the responses to Comments 16 and 17, SCCF funds will be used to provide joint grants to NGO/CSO/community and hotel collaborations to implement coastal adaptation measures. SCCF funds and co-financing will also be used to support a collaboration with the Green Economy Initiative (GEI). The GEI has an objective to promote "green employment" and "green industry" and has the long-term vision of finding sustainable financing to combat degradation. During project preparation, GEI expressed interest in becoming an investment partner in the national production of "palmivelles". Palmivelles would be a unique palisade (i.e., ganivelle) fencing made of the spine of palm leaves which has demonstrated success in a small pilot project by APAL. The motivation for

		producing palmivelle was instigated during the AAP project when APAL had to import ganivelle material from France. APAL imported a type of chestnut tree wood which, although the material was effective, was considered too costly to perform on a larger scale. Through Component 3, the SCCF financed project plans to analyse the feasibility and market demand of locally produced palmivelles which would be fabricated from local Djerba palm trees. If the technique is proven to be succeed in a large pilot test and there is a market to purchase the product, GEI will support the development of a local industry and labor force. A market study must initially be conducted because there is no sense of the needs and profitability for palmivelles. A few hotels expressed interest in using ganivelle after the AAP pilot project, however, the locally-produced palmivelle must demonstrate its effectiveness on a large scale to a large audience. As indicated during Stakeholder consultations, the GEI's interest in analyzing the production of palmivelle is further supported because they would like to test the use leftover palm debris as biomass (which can serve as energy or fertilization). To support the market study, GEI will provide cash co-financing of 30,000 USD to support the financial feasibility study.
20. Is the project implementation/ execution arrangement adequate?	Not Clear. Role of Ministry of Environment and Coastal Planning and Protection Agency as the Executing Agency is understood. However, identity and roles of other executing bodies is unclear. Recommended Action: Please identify and provide information on roles of different executing partners. 9/21/2012 JS	APAL will be the institution responsible for implementing Component 2 of the project with individual contracts sent out to bid for implementation of large rehabilitation/construction works such as beach nourishment.

	Yes. Various executing partners have been identified and their roles are described. It is suggested to clearly identify the institution/s who would implement component 2 of the project.	
Germany Comments		
Concerning expected outcome 1, Germany recommends considering and supporting databases that already exist in APAL, particularly those that will be able to deliver climate services and facilitate access to these data by other institutions to support adaptation decision-making.		The SCCF financed project will support complementing the existing Information System for Decision Aid (SIAD) database housed at APAL that contains coastal monitoring data. The SIAD system website will be updated to provide data exchange with other sectors in Tunisia (e.g., with INM, the National Meteorological Institute and INSTM, the National Ocean Science and Technology Institute). SCCF activities which will support the development of the SIAD include, • Development of a detailed 5 year Action Plan for improved operation of the SIAD • Strengthening and development of the Information System for Decision Aid (SIAD) with the collection of altimetry and oceanographic data
There are two other important undertakings supported by GIZ in collaboration with the Ministry of Environment and the Ministry of Tourism that are directly linked to the project and that shall be taken into account when addressing the vulnerability of coastal areas: The national climate change adaptation strategy of the tourism sector that addresses issues related to sea level rise; and the national climate change strategy (NCCS) which compiles and harmonizes all efforts that have been undertaken in Tunisia related to climate change adaptation as well as climate change mitigation.		The National Climate Change Strategy has been accounted for in the Project Document. It is listed as the first relevant legal/regulatory framework for the SCCF financed project (Table 3 of the Project Document). The SCCF financed project will be updating other relevant frameworks, most notably, the EIA, the new Environment Code, the Maritime Public Domaine and the Code on Land and Urban Development to also account for CC impacts. The impacts of CC and the issues of adaptation as noted in Section 3 of the National CC Strategy, will be essential knowledge shared in the updates to these development and regulatory frameworks. The Project Document also lists the National CC Adaptation Strategy for the Tourism Sector (2010) as one of the relevant strategies in Table 3 of the Project Document. The SCCF financed project is well-aligned with the 2010 National Climate Change Adaptation Strategy in all 3 project Components. The Strategy recommends the Tunisia tourism sector to have water efficient facilities (Component 2) and robust infrastructure (Component 3) as well as to encourage development in low risk areas where, if possible, to support retreat and elevating infrastructure to avoid damage from erosion (Components 1 and 3).

	Specifically, Component 1 is aligned with the Strategy by amending policies such as the Public Maritime Domain to consider SLR and to base decisions on climate change scenarios for different time horizons. Component 2 of the project focuses on promoting water recycling and using alternative sources of water such as Treated Waste Water for hotels and irrigated plots. Similarly, Component 3 supports the Strategy by attracting international financial instruments and by introducing Transferrable Development Credits to discourage building activity in risky areas and encourage adoption of climate-proof construction standards. According to the Strategy, one of the three principal strategic directions for the Tourism sector in terms of adapting to CC which is directly relevant to the SCCF financed project includes: • Reducing the vulnerability of the Tunisian tourist sector by limiting its dependence on resources that may degrade (such as priority beaches which are at risk to coastline erosion and submersion as well as limited freshwater availability) and valuing less vulnerable resources (e.g., inland natural habitat); The SCCF financed project will place importance on inland natural habitat by using a Whole of System approach to consider upstream ecosystem health when implementing coastal protection measures.
166. Germany appreciates the planned coordination of the project with the German development cooperation (CCC/GIZ Project: Supporting implementation of UNFCCC in Tunisia). GIZ is supporting a process on vulnerability assessment of Djerba Island. Thus a close cooperation between the two projects is crucial to optimize resources.	The Africa Adaptation Project (AAP) vulnerability assessment (2012) considered the local action plan on adaptation for the island of Djerba which was conducted in 2008. APAL has confirmed that there has been no detailed study on the vulnerability of Djerba which exceeds the information provided by the AAP vulnerability study. If a detailed study on Djerba will take place during project implementation, APAL will account for the assessment to determine the exact project interventions in Djerba. Please note that the cost-effectiveness analyses have already provided a range of adaptation options with indicative costs based on the vulnerability assessment developed in the AAP. These options will be refined during project development. Please also note that the SCCF financed project has accounted for the Djerba sustainable development plan, created during the workshop in September 2012 with GIZ and the Ministry on the Environment.
APAL is not the only actor in the coastal management field. Germany therefore recommends coordinating with all other institutions involved in the coastal management areas to ensure ownership.	The Government of Germany is entirely correct. The SCCF financed project has implicated the Ministry of Equipment, Land Planning and Sustainable Development, the National Meteorological Institute, the National Ocean

	Science and Technology Institute and the Ministry of Development and International Cooperation among others. These Stakeholders were consulted during project development and will continue to be implicated during project implementation. Under Component 1, these relevant actors will be represented in the national ICZM inter-ministerial platform to be created. The platform will enable coastal projects to be coordinated and resources to be wisely used. It will also facilitate decision making on sustainable coastal development balancing decisions with the potential socio-economic benefits of developments. An important role of this platform will be the establishment of collaborative partnerships with the ongoing, donor driven ICZM relevant initiatives in the region such as with the Global Water Partnership. Also, in Component 1, A key part of supporting ICZM will be to reinforce the technical and human capacities within APAL and its partner agencies (DGAT, ANPE, ONTT, OTEDD, AFT and local authorities) to help them better assess and address emerging and anticipated climate change risks on the Tunisian coast. Furthermore, the SCCF financed project includes the following cross-sectoral activity to facilitate data sharing: 2.4.1 Establishment of an information and communication system between APAL and national and international institutions including INM, INSTM , SHO, lighthouses and beacons services, Research Centers, the Navy National Guard, OMMP, APIP • Development of a standard communication protocol from the National Guard to the level of coastal communities to communicate oceanographic forecasts • Pooling of data available at the relevant institutions (e.g., Hydrological Service, SLR Monitoring, INM, weather forecasting, and INSTM, etc) to feed the Information System for Decision Aid (SIAD) decision support system (Activity 1.3.1)

	• Collaboration with INM to develop bulletins for storm forecasting with sufficient lead time that include recommendations for mitigation measures

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS[34]

A. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:

N/A

B. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

Project Preparation Activities Implemented	***Budgeted Amount***		***Amount Spent To date***		***Amount Committed***	
Fund	**62180 (GEF Fund)**					
Année	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**
1, Local consultants	2500	15000	9044.92	0		6093.85
2, International consultants	8434	64101		10003.2		23340.8
3, Travel	3307	0	4098.19	43.15		
4, Technical workshops	2066	4066	2065.54	0		
5, Management						
6, Service Contracts-Individuals	0		0			
7, Bank Charges						
8, Sundry	526	0	0			
9, Learning - training of counterparts						
10, Services – Companies (committed but not paid)						
11, NEX Advance (not liquidated)						
Total	**16833**	**83167**	**15208.65**	**10046.35**	**0**	**29434.65**

[34] If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used**)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

Not applicable

United Nations Development Programme

Country: Tunisia

PROJECT DOCUMENT[1]

Project Title: Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia

UNDAF Outcome(s): Inclusive, sustainable and resilient model of economic and social development pillar

UNDAF Pillar 1 Outcome 1 By 2019, a new fair, inclusive, sustainable and resilient model of economic and social development implemented by the Government, generating wealth and jobs

UNDAF Pillar 1 Outcome 2 By 2019, regional authorities and Stakeholders efficiently manage and optimally operate sustainable and natural resources

UNDAF Pillar 1 Outcome 3 By 2019, public authorities forecast and manage humanitarian crises and disasters in a better coordinated and more efficient manner

UNDP Strategic Plan (2014-2017) Outcome 1: Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded

UNDP Strategic Plan (2014-2017) Output 1.4: Scaled up action on climate change adaptation and mitigation across sectors which is funded and implemented

Expected CP Outcome(s): Regional development plans elaborated, integrating land use and environmental specifications

Expected CPAP Output(s): Still being drafted

Executing Entity/Implementing Partner:

Ministry of Equipment, Land Planning and Sustainable Development , Coastal Protection and Planning Agency (APAL)

Implementing Entity/Responsible Partners:

Ministry of Equipment, Land Planning and Sustainable Development

APAL regional branches

National Coastal Observatory

Municipality of Houmet Essouk in Djerba

Municipality of Sidi Ali Mekki in the northwest of the Gulf Tunis

[1]For UNDP supported GEF funded projects, as this includes GEF-specific requirements

Local NGOs/CSOs

Tunisia's coast is the backbone of its economy and the confluence of competing resource uses including tourism, fishing and agriculture. Climate change and on-going anthropogenic exploitation make the coastal zone of Tunisia increasingly vulnerable due to associated impacts on agriculture and water quality. Key issues include the erosion of sandy beaches, increasing salinisation of agricultural fields and inundation of low lying wetland areas. Such impacts have resulted in a wide range of negative impacts on the services provided by these ecosystems and will be exacerbated by climate change, in particular elevated sea levels which are projected to rise up to 1m over the coming century.

Currently, projections of future climate change scenarios are not considered in institutional policies and frameworks which guide coastal management in Tunisia. Coastal protection practices are generally reactive with a bias towards hard engineering works because institutional knowledge of holistic, integrated climate change risk management is limited. Exacerbating this situation is that the costs and benefits of coastal adaptation are poorly assessed and overlooked in most policy and investment decisions. Consequently, Tunisia has inadequate means to identify bankable and investment friendly coastal adaptation projects which can have cross-sectoral benefits and simultaneously reduce risks. Overall, these issues make sustainable development in the coastal zone unachievable at present.

In response, this project proposes a risk-based approach to Climate Change Adaptation by enabling flexible adaptation pathways which will build resilience to climate change and provide maximum co-benefits. As tourism is a dominate source of revenue for the region, a set of economic instruments will be devised to signal the existing risks and drive future hotel and private residence development, including investments, away from vulnerable areas. With such an approach, local development plans will be made more risk-based and climate compatible. Both the public and private sectors will serve as important catalysts for adaptation interventions and in supporting coastal monitoring.

Programme Period:	2014-2020
Atlas Award ID:	00079688
Project ID:	00089624
PIMS ID:	4697
Start date:	September 2014
End Date:	August 2020
Management Arrangements	NIM
PAC Meeting Date	Apr 2014

Total resources required	$79,430,000
Total allocated resources:	$79,430,000

- GEF/SCCF $ 5,500,000
- Government (Grant) $ 55,800,000
- Government (Loan) $18,000,000
- UNDP (Grant) $100,000
- GEI (Grant) $ 30,000

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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List of Acronyms

AAP	Africa Adaptation Project
AFT	Agence Foncière Touristique Tourism Real Estate Agency
ALM	Adaptation Learning Mechanism
ANGED	Agence Nationale de Gestion des Déchets (Environnement) National Agency for Waste Management (Environment)
ANPE	Agence Nationale pour le Protection de l'Environnement National Environmental Protection Agency
APAL	Agence de Protection et d'Aménagement du Littoral / Coastal Protection and Planning Agency
AR5	IPCC Fifth Assessment Report
CC	Climate Change
CNT	Centre National de la Cartographie et de la Télédétection (CNCT) / National Mapping and Remote Sensing Centre
CPAP	Country Program Action Plan
CPD	Country Program Document
CRDA	Commissariat Régional au Développement Agricole / Regional Commissary for Agricultural Development
CSO	Civil Society Organization
DGQVE	Direction Générale de la Qualité de la Vie et de l'Environnement (Environnement) / General Directorate of Quality of Life and Environment (Environment)
DGSAM	Direction Générale des Services Aériens et Maritimes Equipement / General Directorate for Air and Maritime Services and Equipment
EWS	Early Warning System
FTH	Fédération Tunisienne de l'Hôtellerie / Tunisian Hotel Federation
GDP	Gross Domestic Product
GoT	Government of Tunisia
HDI	Human Development Index
ICZM	Integrated Coastal Zone Management
IFAD	International Fund for Agricultural Development
INM	Institut National de la Météorologie de Tunisie National Meteorological Institute of Tunisia
INSTM	Institut National des Sciences et Technologies de la Mer National Ocean Science and Technology Institute
IPCC	International Panel on Climate Change
IRA	Institut des Régions Arides / Institute on Arid Regions
LDCF	Least Developed Countries Fund
MEAT, now MEPE	Ministry of the Environment and Development Planning, now the Ministry of Equipment, Land Planning and Sustainable Development
MF	Microfinance
MI	Micro-Insurance
MoI	Ministry of the Interior
M&E	Monitoring and Evaluation

NGO	Non-Governmental Organization
OCHA	Bureau de la Coordination des Affaires Humanitaire / Office for the Coordination of Humanitarian Affairs
OTC	Office de la Topographie et du Cadastre (Equipement) / Office of Topography and Land Registry (Equipment)
ONAS JERBA	Office National de l'Assainissement à Jerba / National Office of Sanitation in Djerba
ONTT	Office National du Tourisme Tunisien / Tunisian National Tourism Office
OMMP	Office de la Marine Marchande et des Ports / Office of the Navy and Ports
OSS	Observatoire du Sahara et du Sahel / Observatory on the Sahara and Sahel
SCCF	Special Climate Change Fund
SHO	Service Hydrographique et Océanographique de la Marine Nationale / Hydrographic and Oceanographic Service of the Navy
SIAD	Information System for Decision Aid
SLR	Sea Level Rise
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SNC	Second National Communication
SONEDE JERBE	Société Nationale d'Exploitation et de Distribution des Eaux à Jerba / National Service of Mining and Water Distribution in Jerba
TOR	Terms of Reference
TWW	Treated Wastewater
UNEP	United Nations Environment Programme
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Program
UNISDR	United Nations International Strategy for Disaster Reduction
USD	United States Dollar
V&A	Vulnerability and Assessment
WFP	World Food Program
WII	Weather Index-Based Insurance
WOS	Whole of Systems approach

1 SITUATION ANALYSIS

1. The coastal zone of Tunisia is home to two-thirds of the total population. It is a densely populated area where the majority of the nation's large cities are found (i.e., more than 1,000 inhabitants/km^2 in Tunis and Sfax against a national average of 57 inhabitants/km^2).[2] The coastal region has a varied topography and an irregular 1,445 km of continental coastline extended from the North to the East, and 450km of island coastline. Coastal wetlands are distributed among 100,000 ha of lagoons, 55,000 ha of Sebkha, 200 ha of estuaries, 31,000 ha of intertidal areas and 5,100 ha of coastal oases (AAP, 2009). The coast of Tunisia has played a pivotal role in the countries cultural and economic evolution. The diverse natural environment provides a wide range of services across a number of sectors. It is home to key public facilities (universities, high schools, schools, hospitals, telecommunication and transport infrastructures, port facilities) and supports the majority of industrial exploits for the country (textile, metallurgical and food processing industries)[3]. Overall, the coast houses more than 70% of economic activities, 90% of the total capacity for tourist accommodation and a great part of the irrigated agriculture in the country (Ministry of Environment and Development Planning, 2001).

2. A recent global study by the World Bank identified Tunisia among the top 12 developing countries that are both highly exposed and vulnerable to coastal threats of Sea Level Rise (SLR). The study found that approximately 5% of the population would be impacted by 1m SLR. The report identifies Tunisia among 7 of the most vulnerable coastal countries worldwide, in terms of % of population exposed to SLR impacts. In the interim, a non-linear increase in SLR is expected with a 20 cm increase by 2040 and a 60 cm increase by 2080 (with a mean of 74 mm).[4] According to research by Dasgupta et al (2011), the combined effects of 10% intensification of storm surges in addition to 1m sea-level rise (in line with expected global maximum predictions of the IPCC Fifth Assessment Report, AR5) will highly impact Tunisia in terms of: proportion of land area, GDP, urban land area, agricultural area and wetland exposed. The study found that most economically important areas (accounting for more than 25% of GDP) are prone to storm surges in Tunisia[5]. A subsequent study by Milano et al., (2013) confirmed these predictions and noted that combined with climate change, pressure on water resources is projected to place catchment areas of Tunisia at very high levels of water stress. It is expected that the ratio of annual water withdrawals to annual renewable water resources will be greater than 80% by 2050.

3. Compounding Tunisia's vulnerability is the fact that its coastal zone is characterized by fast growing urbanization and construction boosted by tourism and real estate development. An increase in infrastructure-heavy investments in ''hard'' shoreline protection measures intended to reduce erosion (such as groins, seawalls, breakwaters, levees, etc.) have been found to trap sediments and accelerate erosion processes. In parallel, over-abstraction and inefficient use of ground water, especially in agriculture has resulted in more active intrusion of seawater and soil salinization. Agriculture and industry along the coasts have also increased the pollution/degradation of lagoon systems, floodplains and wetlands.

[2] National Institute of Statistics (Tunisia) (2012), Demographic and economic data, Tunis (http://www.ins.nat.tn/).
[3] Ministry of Environment and Sustainable Development (MEDD) (Tunisia) (2012b), "Resources and natural environments", Tunis (http://www.environnement.gov.tn/index.php?option=com_content&task=view&id=118&Itemid=173&limit=1&limitstart.)
[4] IPCC Fifth Assessment Report, AR5, Projections from process-based models relative to 1986–2005 data
[5] Dasgupta, S. et al. 2007, The impact of Sea Level Rise on Developing Countries: A comparative analysis. World Bank Policy Research Paper 4136. Washington.

1.1. Climate change - induced problem

4. A number of recent scientific reports[6,7] including assessments of the IPCC[8], Tunisia's Initial National Communication to the UNFCCC and its subsequent Second National Communications' coastal vulnerability and adaptation study, project a hotter, drier and less predictable climate in the region with a temperature increase by 1.1°C in 2020, a decline in rainfall and water availability by 28% in 2050 and more intense and frequent extreme weather events (floods and droughts) over the century. Similarly, climate change-induced sea level rise (SLR), which is increasingly being felt along the coast, has been the subject of several studies both regionally and nationally[9,10].

5. Work completed by Ministry of Environment and Land Planning, (2001) projected that sea level is expected to vary between 0.38 m and 0.55 m by 2100. The IPCC's Fifth Assessment Report (AR5) considers new evidence of climate change which suggests that future sea level rise may be significantly higher with up to 0.98 m possible through the next century with a rise of 12 cm as soon as 2020.[11] It is generally accepted that rising sea levels are the most crucial aspect of Tunisia's vulnerability to climate change[12] and already instances of sea levels rising up to four times higher than the world average have been reported in some areas (in combination with subsidence) (from AAP, 2009).

6. The impacts of climate are likely to have significant socio-economic implications, for example, Tunisia's Second National Communication(SNC), indicated that a scenario of 0.5 m Sea Level Rise (SLR) would result in a loss of 10,000 hectares of agricultural land and 53% of coastal fresh aquifer, a total damage to natural and infrastructural productive capital worth USD 2.6 billion (10% of GDP in

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[6] Ministry of Environment and Sustainable Development (MEDD) (Tunisia) and United Nations Development Program (UNDP) (2009), *Etude d'Elaboration de la Seconde Communication Nationale de la Tunisie au Titre de la Convention Cadre des Nations Unies sur les Changements Climatiques, Phase III: Vulnérabilité de la Tunisie face aux Changements Climatiques*, Tunis.

[7] Ministry of Environment and Land Planning (Tunisia) (2001), Initial Communication of Tunisia under the United Nations Framework Convention on Climate Change, Tunis.

[8]Christensen, J. H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R. K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C. G. Menéndez, J. Räisänen, A. Rinke, A. Sarr, and P. Whetton. 2007. "Regional Climate Projections." In *Climate Change 2007: The Physical Science Basis*, edited by S. Solomon, D. Qin, M. Manning,
Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press

[9] Abouabdillah, A., O. Oueslati, A. M. De Girolamo, and A. Lo Porto. 2010. "Modelling the Impact of Climate Change in a Mediterranean Catchment (Merguelli, Tunisia)." *Fresenius Environmental Bulletin* 19: 2334–47.

[10] Dasgupta, S., B. Laplante, S. Murray, and D. Wheeler. 2009. "Sea Level Rise and Storm Surges: A Comparative Analysis of Impacts in Developing Countries." World Bank Policy Research Working Paper 4901, World Bank, Washington, DC, 43pp.

[11]For RCP8.5, the rise by the year 2100 is 0.52 to 0.98 m, with a rate during 2081 to 2100 of 8 to 16 mm yr–1 (medium confidence). These ranges are derived from CMIP5 climate projections in combination with process-based models and literature assessment of glacier and ice sheet contributions (see Figure SPM.9, Table SPM.2) .IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.– Implications of updated science for the Mediterranean will be clearer with the release of regional reports in 2014. However, it is clear the globally, sea level rise is trading at high ends of projections and for the purposes of risk assessment it is appropriate to consider a 'worst case' scenario by 2100 to contextualise change within a range of scenarios and timeframes allowing formulation of adaptive pathways.

[12] Ministry of Environment and Sustainable Development (MEDD) (Tunisia) (2012a), "Vulnerability and Adaptation", Tunis (http://www.environnement.gov.tn/index.php?option=com_content&-task=view&id=118&Itemid=173&limit=1&limitstart=0).

2006), annual economic losses of US$126 million (with 65% in the tourism sector) and approximately 35,000 lost jobs (1% of the total active population).

7. Sandy beaches, that form close to 35% of Tunisia's coastline and which underpin 80% of the tourism industry, are particularly threatened and predicted to disappear at an accelerated rate as a result of climate change (e.g. Sandy beaches on the Island of Djerba are likely to be completely lost under a 1m SLR). The loss of beach amenity value will have huge implications for revenue generated from tourism which will also be directly affected by damage to infrastructure and changes in the length and quality of climate-dependent tourism seasons (Steyn & Spencer, 2012, Simpson, Gössling, Scott, Hall, & Gladin, 2008).

8. The country's unique and important wetland ecosystems which provide a wide range of services across sectors are at high risk due to the fact that they occur at, or sometimes below the current sea level and have been subject to ongoing exploitation and unsustainable use (e.g. The Ghar el Mehl lagoon in the northwest Gulf of Tunis)[13]. In many locations, such as in the northeast of the Gulf of Tunis, extraction of water and modification to flow regimes has already had a considerable impact on biodiversity in rivers and wetlands; the combination of climate change impacts and human impacts could be much greater than the sum of those pressures.

9. Likely impacts of SLR along the coast of Tunisia will be an increase in shoreline erosion and extended coastal inundation or permanent submersions of low lying coastal areas. Additionally, a reduction in the safety of sea-defense structures and breakwaters as well as salinization of fresh coastal groundwater and estuaries (thus diminishing underground water quality, exacerbating existing and anticipated water stress in a context of growing demand) will occur. These impacts will be accelerated by the ill-conceived human interventions along the coast, such as the construction of unsustainable hard engineering works to reduce sediment transfer or the reduction of protective dunes due to seaside development.

1.2. Problem statement

10. The government of Tunisia is increasingly realizing the current and emerging risks posed to the coastal zone and has attempted to take action through several different initiatives. For example, as early as 1995, the Coastal Protection and Planning Agency (APAL) was established with responsibility for coastal protection in general and the protection of the Maritime Public Domain. Its mission is to manage coastal areas and to ensure their compliance with rules and standards, to initiate studies and conduct research on coastal change and the evolution of coastal ecosystems. The National Program for the Creation of Marine and Coastal Protected Areas aims at establishing these protected zones along the Tunisian coast. Although several relevant plans and strategies exist to inform effective coastal management (e.g. the Code for the Management of Land and Urban Areas (Law 94-1223; Law 2003-78), (CATU); Regulation on the Maritime Public Domain (Domaine Public Maritime, DPM, Law 95-72 of 24/07/1995); Law 2009-49 on Coastal and Marine Protected Areas) and to provide a platform for adaptation (e.g. National Strategy on Climate Change, 2011; National Coastal Adaptation Strategy, 2011), there is little tangible evidence of any meaningful implementation on the ground. Capacity to deal with the impacts of climate change in coastal zones is inhibited by a lack of appropriate climate-sensitized policies and legislation to enable an integrated approach to coastal management.

11. Furthermore, in spite of the fact that Tunisia is a signatory of the regional protocol for Integrated Coastal Zone Management (ICZM)[14] since 2008, a coherent effort to implement ICZM is lacking.

[13] Ayache, F., J. R. Thompson, R. J. Flower, A. Boujarra, F. Rouatbi, and H. Makina. 2009. "Environmental Characteristics, Landscape History and Pressures on Three Coastal Lagoons in the Southern Mediterranean Region: Merja Zerga (Morocco), Ghar El Melh (Tunisia) and Lake Manzala (Egypt)." *Hydrobiologia* 622: 15–43.

[14] Protocol on Integrated Coastal Zone Management under the Barcelona Convention of the UNEP MAP

Tunisia's approach to management of negative climate impacts in the coastal zone has generally been reactive and ad hoc with little strategic planning. The focus of efforts with respect to erosion control has been the use of 'hard' techniques to protect adjacent infrastructure and land. Hard techniques are those involving the construction or the implementation of solid works with the core objective of 'holding the line' of the coast and guarding against the evolution of its geometric configuration. For the most part these measures helped to consolidate the line of coast where they are located, but new problems have emerged such as disfigurement of the landscape, accumulation of algae, eutrophication of waters in areas enclosed by breakwaters, uneven redistribution of sediments, aggressive erosion adjacent to longshore protection works etc.

12. Replicability of interventions has also been hindered by a lack of coordinated maintenance and Monitoring and Evaluation (M&E) to profile the effectiveness of strategies employed. The lack of M&E has precluded medium to long term sustainability of the coastal protection interventions implemented to date.

13. Tunisia also lacks the ability to generate/manage climate information in support of climate risk management (CRM) decisions and to bring adaptation technologies and best practices to the most vulnerable areas and stakeholders. Consequently, Tunisia has failed to integrate climate change into key tools for land use and development planning.

14. In short, in spite of the Governments attempts to address existing coastal erosion and create a platform to facilitate future coastal adaptation to the impacts of climate change, there is a need to translate well intentioned 'visions', principles, policies and plans with respect to effective coastal management into a coherent framework for tangible action. In addition, climate change must be comprehensively integrated into such a framework, including within all its associated tools and techniques (including monitoring and evaluation) so that an enabling environment can be created to pilot new and innovative approaches to coastal adaptation and to make these approaches replicable and sustainable.

15. Equally important is the need for Tunisia to strengthen their capacity to reduce the risk exposure of critical investments (tourism resorts, houses, etc.), to the extent of re-directing them away from vulnerable areas. Adequate financing mechanisms are required to generate and better manage existing and potential funding opportunities to support climate-proof coastal adaptation measures. Without such interventions, difficulties in planning are predicted to continue and worsen (Second National Communication) and the reactive approach to erosion control will continue to the detriment of Tunisia's already highly pressurized and fragile coastal areas.

1.3. Preferred solution

16. The preferred solution will be to adopt 'flexible adaptation pathways[15]' for coastal management which can help identify cost-effective steps for both the public and private sectors in Tunisia to take actions to increase the resilience of their coastal areas to the inevitable impacts of climate change.

[15] Scotland's Centre of Expertise Connecting Climate Change Research and Policy, *Flexible Adaptation Pathways* 2012. www.climatexchange.org.uk
'Flexible adaptation pathways' is an approach to adaptation based on recognizing and addressing the long-term and uncertain nature of climate change by enabling the systematic adjustment of adaptation strategies in response to new information and changing circumstances, in ways that are as efficient and transparent as possible. The approach is founded on a risk-based decision framework for acceptable and unacceptable levels of risk for different issues. Limits and decision criteria (triggers) for risks (when critical thresholds or tipping points are likely to be reached leading to very severe impacts and potentially irreversible consequences) are defined. Alternative adaptation pathways for risks should thresholds be approached are also established. Flexible pathways for adaptation incorporate low and no regrets actions, usually with the implication that these can be implemented now, whilst further research is conducted to enable informed flexible pathways to be established for longer-term aims.

17. Specifically, the solution will include:

- Updates to regulatory frameworks and legislation to decrease the impacts of climate impacts on coastal development and make existing infrastructure more climate-resilient. Particular attention will be paid to creating an enabling environment that advances Integrated Coastal Zone Management that takes climate change risks into account.
- The application of soft, ecosystems based measures such as coastal protection measures (e.g., dune and wetland restoration) and best water management practices (e.g., controlled extraction of groundwater reserves to prevent the saltwater intrusion) in line with Integrated Coastal Zone Management
- Addressing the needs for improved climate information for coastal risk monitoring, early warning system and climate resilient development planning
- Mobilization of public and private funds to finance coastal adaptation projects on national and local levels by improving the bankability of projects
- Introduction of risk transfer methods to the public and private sectors to ensure long term climate resilient management practices of coastal regions and their human and economic assets

1.4. Barriers of the project

18. The normative solution that is to be financed by SCCF resources, in conjunction with different baseline finance, is hindered by a number of institutional, financial, technological and informational barriers. These barriers are outlined in this section.

1.1.1 Existing coastal development planning and regulatory frameworks do not support anticipatory and integrated management of climate change risks

19. Tunisia's approach to respond to climate change in coastal systems has to-date been predominantly reactive. Existing baseline actions, such as the APAL's protection programme, consist mainly of remedial, ''end-of-the-pipe'' solutions. Any focus of attention on prevention is at best minimal. Spatial planning regulations, building codes and disaster management plans do not factor in forward-looking approaches and measures that protect, accommodate or avoid on-going and anticipated impacts of climate change on the built environment, especially in tourism districts. For example, current rules and distance for coastal development setbacks are not predicated on site-specific assessments of historic and projected trends in shoreline profile nor do they offer a sufficient level of land-use control to avoid allocation of vulnerable lands to housing and construction activities. Similarly, Environmental Impact Assessment requirements do not account for sea level rise related risks and capacities for enforcement remain limited which results in inappropriate siting and construction of maladapted infrastructures in potentially hazardous areas.

20. Although Tunisia has signed the Integrated Coastal Zone Management (ICZM) protocol of the Barcelona Convention, any attempts to implement ICZM at a country level have been supported predominantly by regional initiatives and insufficiently recognized by national policy makers. Consequently, there are limited applications of using the restoration of natural processes as a coastal management option by the agencies involved with coastal development in Tunisia.

1.1.2 Limited expertise and knowledge of various risk assessment and decision support tools for adaptation planning, early responses and/or medium-term to long-term risk management

21. Despite a growing knowledge base, important information gaps remain on the nature, magnitude and distribution of key climate-change driven hazards in coastal areas (i.e. erosion processes; storm surge levels, salinization patterns, etc.). Existing monitoring and forecasting functions within APAL and its

partner agencies are limited in scope and lack the robustness, integration and focus needed to convey relevant inputs and warnings to policy makers and vulnerable stakeholders in a timely and efficient manner. When available, data are not processed, shared or used in a way that can support improved vulnerability assessments and adaptation planning. Coastal monitoring data (from buoys and tide gauges) are generally incorporated into APAL's Decision Support System Database (SIAD) which are then treated and made available on a website. Other socio-economic data are not used to inform planning and decision-making and alert generation. Consequently, institutional mechanisms, capacities and tools for in-depth socio-economic analysis of climate change impacts and adaptation options (including economic valuation methods) are limited in Tunisia. This creates a barrier to well-informed decision-making at both policy and operational levels.

22. A predominant issue is that current decisions are based on one scenario and timeframe for sea level rise (1m by 2100) which precludes application of a 'flexible adaptation pathways'. This approach is based on recognizing and addressing the long-term and uncertain nature of climate change by enabling the systematic adjustment of adaptation strategies in response to new information and changing circumstances. Pathways are determined using a risk-based decision framework based on the idea that if flexible adaptation is pursued, then risk will be kept at an acceptable level. The approach also identifies alternative adaptation pathways for risks should thresholds be approached.

1.1.3 Limited understanding of a Whole of Systems[16] approach as a means to address current and anticipated climate related risks in the coastal regions.

23. Traditionally, only isolated segments of the shoreline are developed or rehabilitated without consideration of upstream (or updrift and downdrift) hydrological, ecological and geomorphological processes. Engineering and heavy infrastructure driven solutions at select locations are still a dominant feature of most coastal adaptation responses, including APAL's National Coastal Protection Programme. Consequently, current interventions are not designed considering the implications and management of the watershed as a whole. In addition, interventions do not consider climate change predictions and their long-term implications. The multi-sectorial agencies involved also cannot offer sustainable adaptation solutions with technical, economic and environmental viability. More complex and integrated approaches are thus needed to respond to large-scale, rapid and irreversible changes in hydrological and shoreline conditions. However, Tunisia has insufficient knowledge of available cost/effective, flexible and environmental-friendly coastal protection and water management technologies that would sustain development investments and would not turn into maladaptive, coastal area damaging practices. The value of climate compatible measures to tackle climate-driven SLR and its impacts on coastal settlements and sectors, including its implications on water stress (such as soft shoreline protection strategies or coastal aquifer management to prevent seawater intrusion) clearly needs to be further demonstrated, promoted and scaled up country-wide. Importantly it will be necessary for key stakeholders involved in management and planning in the coastal zone to be sensitised to innovative 'inter-disciplinary approaches' with respect to climate change adaptation as opposed to simply innovative tools and techniques to apply to cater to an identified need.

[16] The Whole of Systems (WOS) approach can be defined as the integration of multi-disciplinary knowledge and the idea of coastal spaces as a whole, including the complex relations between maritime and terrestrial systems. Through such an approach, changes in coastal geomorphology (i.e., beach and dune systems) are considered along with changes in the surface water and groundwater systems for example. The goal of the WOS approach is to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics so that a sustainable outcome can be achieved.

1.1.4 Inadequate means to mobilise funds for risk-reducing and adaptation activities on public and private levels

24. While there is mounting awareness of the need to mobilize financing flows additional to development assistance, national capacities to develop and implement innovative economic instruments to attract new public finance and private sector engagement for adaptation remain low. This is compounded by the fact that the costs and benefits of adaptation continue to be poorly assessed and overlooked in most policy and investment decisions. The forthcoming Green Economy Initiative is illustrative of this deficiency. While climate change is amongst its top priorities, the attention is placed primarily on the economic challenges of mitigation and sustainable energy development and adaptation issues are not yet addressed on the same footing. More generally, there are no proper methods and mechanisms yet that allow for the economic dimensions of adaptation in coastal zones to be fully internalized at the level of public sectoral budgeting or in the budgets of private enterprises (such as tourism developers) and households (including property owners). For instance, the use of insurance and fiscal incentives to put a price tag on risks and send a powerful signal to discourage risk increasing behaviour (e.g. through higher premiums and property taxes) and promote risk reducing activities (such as climate proofing or relocating homes) does not yet exist in Tunisia.

1.1.5 Limited Monitoring and Evaluation (M&E) of coastal protection interventions

25. Effective adaptation at a project level must be in essence 'adaptive' and able to deal with the range of uncertainties that climate change poses. This 'adaptability' must be based on an on-going system for monitoring and evaluation that watches for changes and registers responses). To date, there have been isolated point interventions for coastal protection and management which have not been documented and hence lessons learned have not been captured. Consequently, APAL has had limited ability to upscale successful pilot tests.

26. The lack of established M&E systems in Tunisia, based on experimental design principles, is a barrier to learning through experience and fails to allow new insights to be integrated as they emerge. While M&E can play a critical role in learning from successful pathways towards adaptation, it can also be a critical tool for identifying mal-adaptative pathways. Presently, there is limited experience in the development or application of s impact-based indicators and an experimental design framework for M&E to allow the introduction of new information and activities to shape the course of adaptation at later stages, following incremental reviews. A range of indicators including those which demonstrate support for livelihoods and access to resources needs to be developed (Villanueva 2011; WRI 2011; Agardy et al 2011; UNEP/EPA 2006, STAP 2012[17]).

2 STRATEGY

27. No single initiative can completely remove all of the barriers aforementioned. Nonetheless, this initiative, with SCCF financing, will work in conjunction with other baseline and adaptation related initiatives to build off of their advances in removing these barriers.

28. SCCF financing will be used to remove a number of barriers and doing so is expected to result in the following three outcomes:

29. Outcome 1:Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved.

[17] Ferraro, P.J., *Experimental Project Designs in the Global Environment Facility: Designing projects to create evidence and catalyze investments to secure global environmental benefits*, STAP Advisory document, May 2012.

30. Outcome 2: Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 40 km of coast and benefiting 150,000 inhabitants.

31. Outcome 3: Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures.

32. A three pronged approach to support long-term resilience of the coasts of Tunisia is pursued by the Government in this initiative. Firstly, SCCF funds will be used to revise critical national regulations on coastal zoning based on impact scenarios generated by numerical coastal climate impact models. SCCF resources will also be used to develop local climate resilient development plans for the vulnerable coastal locations identified by the SNC. Secondly, SCCF resources will be directly invested in advanced and climate resilient coastal defense options, considering the current coastal land use practices and future priorities, geomorphological specificities of the coastline and a range of plausible scenarios of SLR impacts over specific periods. Thirdly, SCCF resources will be used to introduce a range of risk management instruments such as insurance to drive away development infrastructure from the highly sensitive and exposed coastal regions to promote long term coastal resilience.

33. The achievement of these outcomes is expected to strengthen the capacity of national and sub-national entities to monitor coastal parameters and more effectively respond to climate change risks. A comprehensive approach to the integration of climate risks management into the policies and practices governing coastal development, with a special emphasis on low-lying densely populated tourism areas will benefit Tunisia in the medium and long-term. Addressing pressing coastal adaptation challenges while creating an enabling environment and technical capacities needed to respond to long-term implications of sea level rise on the natural environment and the built environment will enable the country secure development gains in the face of the worsening climate change challenge.

34. With SCCF financing, long term resilience of the coast, coastal assets and population will be achieved through the adoption of a Whole of Systems (WOS) approach within a framework for Integrated Coastal Zone Management (ICZM). The Whole of Systems (WOS) approach can be defined as the integrity of coastal spaces that include the complex relations between marine and terrestrial systems. Through such an approach, changes in coastal geomorphology (i.e., beach and dune systems) are considered along with changes in the surface water and groundwater systems for example. The goal of the WOS approach is to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics so that a sustainable outcome can be achieved.

35. Lessons learned from Whole of Systems approach measures in the target coastal areas will then feed back to the planning level to be able to sustain and scale-up the project's evidence-based best practices. The project will promote the benefits of natural defense features (such as dunes, intertidal zones etc.) and their services by demonstrating the opportunities they provide for sustainable economic development in conjunction with the provision of defenses against the negative effects of climate change at two important target sites (Djerba and the northeast coast of the Gulf of Tunis).

36. In parallel, the project will support improved land use and coastal zone development control mechanisms to minimize exposure to extreme weather and climate change impacts. Since the tourism industry and residential infrastructure dominate the coast, a set of incentives and control mechanisms such as insurance products are needed to signal the risk and drive future investments away from vulnerable areas so as to make coastal assets more climate compatible.

2.1 Project rationale and policy conformity

37. The project is fully in-line with Tunisia's First and Second National Communications (FNC, SNC) which identified sea level rise and coastal development as a top priority for adaptation action. The

SNC supported a comprehensive coastal V&A assessment which has informed the detailed design of this initiative. The FNC and SNC recognizes, inter alia, the need to build supportive national capacities to accelerate the diffusion of innovative adaptation technologies and practices in vulnerable areas such as Djerba and underscores the criticality of exploring new financial options and economic instruments to sustain adaptation efforts over the long run. In fact, the vulnerability study was recently updated and concluded that more than 790 Km of Continental Tunisian coastline (55%) and 266 Km of low island coastline (59%) are vulnerable to SLR. The study also confirmed that economic impact of climate change related SLR on agriculture and tourism is estimated to 0.63% of GDP/year. As a result the coastal adaptation is prominently featured in all national strategies in Tunisia such as the 12th National Development Plan (2012-2014) and National Development Strategy (2012 –2016) that both identify coastal adaptation as one of the key priorities for sustainable development in Tunisia. For example, the National Development Plan calls for full integration of climate change effects into land and water management planning, protection of vulnerable shorelines against coastal erosion, deployment of TWW reuse technology as well as private sector involvement, local decentralization and fiscal reforms for greater environmental and climate resilience. These priorities were confirmed after the 14th of January 2011, the date when Tunisia shifted from dictatorship to a new era tending for setting up democracy. In fact, the need to strengthen local governance as a condition for sustainable development and climate resilience at regional and local level is now more important than ever.

SCCF conformity

38. This project is fully consistent with SCCF objectives and priorities. It addresses the focal area, adaptation to Climate Change and touches upon 5 programming priorities.

- integrated coastal zone management;
- water resources management;
- infrastructure development;
- supporting capacity building, including institutional capacity, for preventive measures, planning, preparedness and management of disasters relating to climate change, including contingency planning, in particular for droughts and floods in areas prone to extreme weather events.

39. Component 1 of this project supports LDCF/SCCF area objective 1 (CCA-1) by mainstreaming adaptation in broader development frameworks at country level and in targeted vulnerable areas. Similarly, Component 3 of this project supports LDCF/SCCF area objective 1 (CCA-1) by incorporating climate change risk management using regulatory and planning reform as well as fiscal incentives. The technologies to be adopted in this project include innovative and sustainable economic instruments to mobilize funds for adaptation and provide risk sharing / risk reduction measures.

40. Components 1 and 2 of this project support LDCF/SCCF area objective 2 (CCA-2) by increasing the adaptive capacity to respond to the impacts of climate change, including variability, at local, regional and national levels. Component 2 also supports LDCF/SCCF area objective 3 (CCA-3) by promoting the transfer and adoption of adaptation technologies. The technologies to be adopted in this project include soft coastal protection measures such as Living Shorelines.

41. Outcomes 1, 2 and 3 of this project are aligned with the GEF LDCF/SCCF portfolio level outcomes/outputs, namely

  - Outcomes 1 and 3 are aligned with LDCF/SCCF Output 1.1.1: Adaptation measures and necessary budget allocations included in relevant frameworks

- Outcome 2 is aligned with LDCF/SCCF Output 1.2.1: Vulnerable physical, natural and social assets strengthened in response to climate change impacts, including variability. Also, Outcome 2 is aligned with LDCF/SCCF Output 3.1.1: Relevant adaptation technology transferred to targeted groups.
- All Outcomes are aligned with LDCF/SCCF Output 2.2.2: Targeted populations groups are covered by adequate risk reduction measures.

ICZM conformity

42. The project has also been designed to support Tunisia's priority on ***Integrated Coastal Zone Management (ICZM).*** (Tunisia is a Contracting Party to the Barcelona Convention (UNEP/MAP-BC) and a signatory of the ICZM Protocol.) To support Tunisia's commitment to ICZM, SCCF funds aim to build the capacity of coastal management agencies to apply integrated coastal management. Also, the project aims to establish a cross-sectoral, inter-ministerial platform to facilitate ICZM at national and local levels. Furthermore, aligned with ICZM, the risk assessment process to be adopted by the project will involve a participatory and consensus led approach to understanding SLR and other climate change related coastal risks as a means to undertake site specific adaptation planning.

GEF conformity

43. The project has been designed to meet overall GEF requirements in terms of design and implementation. For example:

Sustainability: The project has been designed to be sustainable at village and at national levels by building the capacity of agents on state levels to implement coastal adaptation activities.

Monitoring and Evaluation: The project is accompanied by an effective M&E framework, that will enable an on-going adaptive management of the project, ensuring that lessons are learnt, management decisions are taken based on relevant and up-to-date information, and regular progress reports are available for concerned parties. M&E will be emphasized for the soft protection techniques to be implemented because up until now, the GoT has not effectively monitored and quantified the success (or the lack of success) of other interventions.

Replicability: Significant attention has been paid in the project design to ensure that lessons are replicable, sufficient training builds capacity to transfer expertise into other initiatives and that necessary replication mechanisms are in place. The financial instruments to be created to mobilise funds for coastal adaptation and to transfer coastal risks for the country will assist in up-scaling.

Stakeholder involvement: The design of this project was undertaken in a participatory manner with six (6) visits to the sites to conduct Stakeholder consultations. Moreover, the design of the project has ensured the appropriate involvement of stakeholders (actors and users) in project development and implementation (See Section 2.9).

Multi-disciplinary approach: the project will undertake a number of activities to ensure various Ministries, NGOs/CSOs are fully engaged, have capacities built and can contribute to the successful implementation of coastal adaptation measures.

Gender equality: the project Outcomes will contribute to the facilitation of access to microfinance for women. Women will have access to MF to build nurseries necessary to support the soft coastal adaptation measures. Artisanal fishing by women on the Island of Djerba will be supported with the application of ICZM. The project has also ensured and will continue to ensure that women NGOs can continue to be

integrated as Stakeholders and can voice their suggestions/concerns on the effectiveness of coastal adaptation measures.

Complementary approach: In order to build upon existing plans and avoid the duplication of efforts, the project will work in conjunction with relevant on-going projects in Tunisia and will build off of similar initiatives for each project component (e.g., MedPartnership, Coastal Protection Programme).

44. The project fully satisfies the SCCF eligibility criteria as stated in the GEF Council Paper GEF/C.24/12 and Revised Programming Strategy on Adaptation to Climate Change for the Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) GEF/LDCF.SCCF.8/Inf.4. It has also followed the Programming Strategy on Adaptation to Climate Change for the Least Developed Countries Fund (LDCF) and The Special Climate Change Fund (SCCF)[18]. The SCCF programming guidance prioritizes integrated coastal zone management and highlights the "implementation of adaptation measures such as beach nourishing at particularly important sites; Construction of hydrological models; Institutional support for implementation of integrated coastal zone management and disaster management". These are the main elements that the proposed project follows. This approach is also aligned with the scope of expected interventions as articulated in the SCCF programming paper and decision 5/CP.9.

45. The project fully complies with the additional cost requirements of the SCCF. As defined by the GEF Clarification on the Concept of Additional Cost of Adaptation to Climate Change GEF/LDCF.SCCF.12/Inf.04 "analyses of climate change risks and necessary modifications to Business As Usual (BAU) project can be considered an additional cost".

2.2 Country ownership: country drivenness and country eligibility

46. The project is country-driven and constitutes a direct follow-up to the main recommendations contained in the Initial and Second National Communications which both give priority to the mainstreaming of adaptation concerns into the development of coastal regions of Tunisia (see Discussion in Section 2.1).

47. The proposed project is also aligned with the 2010 National Climate Change Adaptation Strategy for the Tourism Sector. The Strategy stems from a meeting of the World Tourism Organization in 2007 in Davos where it was recommended for national tourism sectors to adapt to CC so that tourism can remain competitive and resilient to the impacts of SLR, temperature increase, precipitation decrease, erosion and fresh water scarcity. The Strategy recommends the Tunisia tourism sector to have water efficient facilities and robust infrastructure as well as to encourage development in low risk areas where, if possible, to support retreat and elevating infrastructure to avoid damage from erosion. In general, the Strategy recommends exercising no-regret solutions for tourism investments basing decisions on climate change scenarios for different time horizons.

48. According to the Strategy, one of the three principal strategic directions for the Tourism sector in terms of adapting to CC which is directly relevant to the proposed project includes:

- Reducing the vulnerability of the Tunisian tourist sector by limiting its dependence on resources that may degrade (such as priority beaches which are at risk to coastline erosion and submersion as well as limited freshwater availability) and valuing less vulnerable resources (e.g., inland natural habitat);

49. This project is also closely linked to Tunisia's country priorities of the upcoming UNDAF (2015-2019), Axis 2: Inclusive, Sustainable and Resilient Economic and Social Models. Relevant UNDAF outcomes for this project include:

18 GEF/LDCF.SCCF/R3/1.Rev.3; prepared by the GEF Secretariat.

- UNDAF / Country Programme Outcome: By 2019, a new fair, inclusive, sustainable and resilient model of economic and social development implemented by the Government, generating wealth and jobs

- UNDAF / Country Program Outcome: By 2019, regional authorities and Stakeholders efficiently manage and optimally operate sustainable and inclusive natural resources

- UNDAF / Country Program Outcome: By 2019, public authorities forecast and manage humanitarian crises and disasters in a better coordinated and more efficient manner

For this lattermost Outcome, an output for climate change adaptation and building resilience (including coastal resilience) is planned.

50. This project is also closely aligned with UNDP's Strategic Plan (2014-2017), in particular Activity 1, Means of Sustainable Development and Activity 3, Resilience Reinforcement. It supports Sector Sustainable Development by stressing planning and policy reforms to consider environmental projections such as Sea Level Rise. The project will also reinforce coastal resilience by supporting i) the management and rehabilitation of ecosystem services, ii) integrated management of water resources as well as iii) efforts to protect and restore the health, productivity and resilience of the oceans and marine ecosystems.

51. The proposed project is aligned with the SP by supporting the introduction and implementation of innovative economic instruments and solutions to reduce risks associated with natural disasters, such as through the introduction of property insurance (where flooding would be considered), and building or reinforcing infrastructure susceptible to erosion. Similarly, the proposed project aligns itself with the SP by building innovative partnerships (e.g., joint hotel and community adaptation projects), increasing the mobilization of domestic resources to finance coastal adaptation and facilitating institutional data exchange.

52. Moreover, the proposed project has been designed as a concrete contribution to the goals and expected outcomes of the "United Nations Bridge Programme" (UNBP) and Strategy for the "UNDP support to the democratic transition" (SSDT) in Tunisia (2013-2014, to be renewed in 2015). More specifically, the project will support the following UNBP outcome: Public institutions, private sector and civil society have new tools for integrated management of natural resources and ecosystems, including adaptation to climate change. It will also answer the following outcome of the SSDT: Improve local governance for sustainable development.

53. This project is in-line with the fourth focus area of the Regional Programme for Arab States 2010-2013, (Focus area 4: Environment and sustainable development) by implementing strategic interventions in order to support processes and policies addressing environmental issues in the context of adapting to climate change. Also, in alignment with the Regional Programme for Arab states, SCCF financing will support government to develop strategies for integrated water resources management through technical assistance and knowledge-building.

Relevant national frameworks

54. The following laws, regulations, legal frameworks and strategies refer to the Coastal Zone. The right-side column indicates if the document requires updating and will be addressed with SCCF financed activities.

Table 1: Relevant laws, regulations and legal frameworks

Law, Regulation, Legal Framework or Strategy	**Additional Information**	**Requires Updating**
COASTAL		

Regulation on the Maritime Public Domain (Law 95-72 of 24/07/1995) (Domaine Public Maritime, DPM);	Stipulates that the coastal fringe located within the DPM is considered public and may be used by anyone without restriction. In the absence of an approved development plan, it is forbidden to build less than 100 meters from the high water line. This delineation aligns to the ICZM protocol of the Barcelona Convention of which Tunisia is a signatory. The 100 meter delineation is increased if the region is ecologically sensitive. If the area has an approved management plan, development cannot take place less than 25 meters from the high water line.	Yes (requires updating)
Law 2009-49: Coastal and marine protected areas	This law introduced in 2009 discusses types of marine and coastal ecosystems, marine biodiversity, endangered habitats, endangered species and important scientific sites.	
The Code for the Management of Land and Urban Areas (Law 94-1223; Law 2003-78), CATU and the Law (28/ 11/ 1994) on land-use and town planning	Sets the rules for the organization and operation of best space planning, creation and development of urban and residential areas	Yes
Urban Development Plan (Plan d'Aménagement Urbain, PAU), 3 Cctobre 1995, Ministry in charge of Equipment and Habitat	Each region in Tunisia must have an Urban Development Plan (Plan d'Aménagement Urbain, PAU). According to the CATU described above. PAUs must include a) an assessment of the social, demographic and economic situation, c) an analysis of the effects of implementation of the development plan on the physical and environmental characteristics of the site concerned and the measures to be taken to their protection and development and d) the justification for the urban development options with the guidance from legislation related to public easements governing land use pattern	Yes
Regulations on Environmental Impact Assessment (Law 115 of 30/11/1992 and Law 2001-14 of 30/01/2001 and Decree No:91-362);	Requirements for an environmental impact assessment which is administered by the National Agency for Environment Protection (Agence Nationale de Protection de l'Environnement, ANPE), The Decree differentiates projects based on A and B categorizations.	Yes
RAMSAR	Intergovernmental treaty whose mission is "the conservation and wise use of all wetlands. Tunisia ratified the Convention on Wetlands (Ramsar, Iran, 1971). The Northwest Golf of Tunis and Djerba have wetlands in the Ramsar List of Wetlands of International Importance	
Strategy of Coastal Adaptation to Climate Change induced SLR (2008) and National Coastal Adaptation Strategy (2011)	The National Coastal Adaptation project was developed in the framework of the African Adaptation Project (AAP). Both strategies were reinforcement through AAP.	

Table 2: Other relevant laws, regulations, legal frameworks and strategies

Law, Regulation, Legal Framework or Strategy
ENVIRONMENT
National Strategy on Climate Change (2011)
National Strategy of Adaptation to Climate Change for the Energy Sector (2010)
Strategy of Adaptation to Climate Change for the Agriculture Sector (2007)
African Convention on the Conservation of nature and Natural Resources
TOURISM
Ministry of Tourism Strategy 2016
Jasmin Strategy (2012-2016), Strategy on Economic and Social Development by the Ministry of Development and International Cooperation
National CC Adaptation Strategy for the Tourism Sector (2010)
WATER
Water Code (13/ 03/ 1975),
Law of 17 July 1995 on water and soil conservation;
Law 95-70, relating to the National Council for Water and Soil Conservation;
Laws regulating discharges into water bodies, NT 106 002
BIODIVERSITY
Law 94-122 of 28 November 1994 promulgating the National Land-Use and Town Planning Code;
The Forestry Code (Law No 88-20 of 13 April 1988);
Decrees for National Park and Nature Reserve creation
National Protection Strategy for Biological Diversity, Stratégie Nationale Protection de la Diversité Biologique (1998),
MARINE/FISHERIES
Law 94-13 of 31 January 1994 on fishing and circulars issued by the Ministry of Agriculture.
Law 96-29 of 3 April 1996, setting up a national emergency intervention plan to deal with sea pollution.
DESERTIFICATION
UNCCD (2000), National Programme of Action to Combat Desertification and Mitigate Drought Impacts (PAN)

2.3 Design principles and strategic considerations

2.3.1 Baseline projects and financing

55. The Coastal Protection and Planning Agency (APAL) and the General Directorate for Air and Maritime Services and Equipment (DGSAM) are currently self-financing the following coastal protection and coastal livelihood improvement projects which have been put under the umbrella of the ***National Coastal Protection Programme (NCPP)***.

56. The proposed project will enhance the design and implementation of baseline coastal protection measures by building APAL's capacity to consider a Whole of Systems approach for coastal management for medium and long term impacts of climate change as well as vulnerabilities across key sectors (tourism, agriculture, fisheries, water). Ecosystems, natural sedimentation processes and the upstream and downstream watershed hydrology will be considered for the first time in APAL's interventions. SCCF funds will also be used to facilitate the implementation of appropriate soft solutions in other interventions by giving APAL the expertise to exploit existing coastal monitoring data, consider climate change scenarios, generate risk based assessments and recommend appropriate soft protection measures and monitoring schemes. This knowledge will be transferred to other projects at the baseline to adopt such long term resilience building approaches. Natural functions of complex and dynamic, coastal watershed systems will be supported to achieve long term resilience. For example, coastal estuaries and bordering wetlands will be supported to act as a natural buffer, absorbing floodwaters and dissipating storm surges. Similarly, beaches will be reinforced with vegetated coastal dunes and coastal aquifers will be properly managed to reduce saltwater intrusion. Additionally, local plants and native materials will be adopted to offer cost-effective protection measures. Many of the soft protection measures can be constructed, implemented and monitored using local manpower.

57. Specially, SCCF financing will build on the following baseline projects.to address the aforementioned barriers in the following manner:

Table 3: List of baseline projects included in the ***National Coastal Protection Programme (NCPP)***, their locations and how SCCF funds will be used to strengthen their interventions

No.	Baseline project/programme in the *NCPP*	Cofinancing Amount	Type	Location	Strengthening of existing interventions with SCCF funds
1	**Development work in the coastal zone of the Monastir Bay (1st phase)** (funded by APAL, 2014-2015,) – This project involves dredging and deposition of sand in Monastir Bay, beach nourishment and beach consolidation in several sites. It also includes the construction of hard coastal protection measures such as installation of riprap[1], dikes and construction of a concrete drainage canal.	USD 7.9 m	Grant	Monastir Bay (In complementary location, not in pilot areas)	The proposed project will work closely with the self-financed APAL initiative in order to integrate components of coastal adaptation and protection needs into the planned projects. SCCF funds will provide technical capacity to APAL so that the projects can more effectively consider improving the watershed as a whole and take greater consideration of anticipated coastal changes and climate change scenarios such as Sea Level Rise.
3	**Extension and rehabilitation works at the Chebba fishing port** (funded by DGSAM, 2013-2015). This project involves the reconstruction and development of the port. Three piers will be constructed in addition to several docks and a jetty. A rock-filled coastal protection embankment will be built at the wharf and the navigable part of the bay will be extended in order to ensure access by using dredging and rock excavation.	USD 6.4 m	Grant	Chebba fishing port (In complementary location, not in pilot areas)	SCCF financed capacity reinforcement for APAL will enable them to provide climate resilient options for the Chebba port as part of their rehabilitation programme. Specifically, resources will be used to bear expertise on how to integrate coastal developments with natural processes (e.g., runoff flows, sedimentation processes). By rehabilitating natural processes, the capacity of the coastal system to withstand the SLR and other climate change related threats will be enhanced. Capacity building for APAL and DGSAM will enable to look at the project from the watershed perspective. Also, any water recycling measures or uses of Treated Wastewater (TWW) which are documented in the SCCF financed project will be evaluated for use at the port.

4a	***KFW Coastal Protection*** projects, Phase I (funded by KFW, 2013-2017 in Kerkennah Raf Raf) and Phase II (2014-2018 in Sousse Nord /Hergla Rades / Soliman) are being supported by KFW in Tunisia. The main objective for both phases is the ecological and economic rehabilitation of the some coastal sites in Tunisia to protect against sea erosion. The four components of the project include 1) enabling access to the sea through ramp construction, 2) achieving watertight protection against seawater intrusion in Elataya, 3) the development of pedestrian and bicycle routes and 4) planting vegetation adapted to the coastal environment. A team of coastal experts is housed within APAL to support the design and construction of techniques to protect the coast from erosion. Phase I and Phase II plan to perform point coastal protection measures. Specifically, in Kerkennah, landscaping will be done in a few locations behind seawalls to help prevent marine erosion. In El Attaya, the project proposes to use hard construction measures, namely seawalls to prevent against seawater intrusion. The two alternatives for seawalls currently being studied include a dam with a concrete core and a dam with a clay core.	Phase I: USD 20.5 m, Phase II: USD 10.6 m	Grant	Kerkennah Raf Raf and Sousse Nord /Hergla Rades / Soliman (In complementary location, not in pilot areas)	Although activities by KFW will assist with point erosion protection measures, some 'soft', none of the interventions are considering the watershed as a whole, noting upstream and downstream impacts. The SCCF financed interventions will add such experience by building the capacity of APAL to make the KFW interventions more sustainable and climate resilient in the long-term. SCCF investment will support groundwater management decisions so that salt water intrusion can be reduced. Similarly, SCCF resources will help in introducing the most appropriate native grasses to reduce marine erosion.
4b	***APAL (Tunisia) contribution to the KFW Coastal Protection Projects: Phase I + Phase II, above***	USD 10.4 m	Grant	Kerkennah Raf Raf and Sousse Nord /Hergla Rades / Soliman (In complementary	See above

				location, not in pilot areas)	
	SUBTOTAL (non-loan projects included in APAL's National Coastal Protection Programme	USD55.8m			
7	***Coastal Protection from Carthage to Gammarth Programme*** (funded by the Saudi Fund for Development (loan), 2013-2015): This project focuses on implementing hard coastal protection measures along the Tunisian coast from Carthage to Gammarth to protect against the adverse impacts of sediment transport and erosion. It aims to protect economic and social infrastructure, such as houses, hotels, service networks and roads by using beach nourishment on a stretch of 30-50 m and by installing riprap on infrastructure for protection against sea erosion and storm surges. Indirectly, the project aims to protect coastal forests and agricultural terraces which have increasing groundwater salinity levels. Presently, affected populations are moving away from these regions without any other options.	USD 18 m (loan)	Grant	Along coast from Catharge to Gammarth, not in pilot areas	Although the project from Carthage to Gammarth is a significant example of coastal protection, without the SCCF support, this project will fall short of the long term vision of coastal adaptation which requires more flexible and cost-effective "soft" alternatives that allow for greater resilience of the coast as well as consideration of water management practices on the watershed level. SCCF funds will be used to build the technical capacities within APAL to integrate a watershed perspective including ecosystem-focused approach to coastal protection plans from Carthage to Gammarth. More soft solutions will be implemented from Carthage to Gammarth as a result.

58. This project will also build off on-going water and green economy projects, programmes and initiatives which are planned or have demonstrated success on the ground.

- The Global Water Partnership (GWP)[19] is active in implementing the ***Water Climate and Development Program for Africa*** (WACDEP, 2014-2016, 9.2 m USD) in Tunisia. WACDEP aims to (a) integrate water security and climate resilience in development planning, (b) develop partnerships and capacities to build resilience to climate change through better water management, and (c) develop 'no regret' financing and investment strategies for water security and climate change adaptation. The SCCF financed project will complement the WACDEP initiative by focusing on building climate resilience in the specific field of coastal management. The SCCF financed project will support the demonstration project and other GWP initiatives by detailing and piloting best water management practices. Also, the GWP projects will be able to leverage updated regulatory frameworks (local Agenda 21 and CATU) which will be supported by SCCF funds to consider predicted coastal climate change impacts, most notably sea level rise. (

- The National Adaptation Plan Global Support Programme (NAP-GSP) has partnered with the Global Water Partnership (GWP), in collaboration with United Nations Development Programme (UNDP), the Centre for Environmental Economics and Policy Analysis in Africa (CEEPA-University of Pretoria) and other partners, to provide support for Tunisia to integrate the economics of adaptation in the context of water security and climate resilient development. Under this cooperative umbrella, the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** initiative (2013-2014, to be led by UNDP) will reinforce the planning capacity of national institutions in Tunisia to perform sound economic analysis of adaptation. The initiative will help build the capacity of planners and technical officers to identify, develop and appraise no/low regrets investment options and integrate these into planning processes, programmes and plans. This initiative will contribute to enhanced understanding of the economics of adaptation as it relates to medium- and long-term regional, trans-boundary, national, sub-national and sectoral development planning as well as in evaluating different adaptation investment projects. Five regional level training workshops are planned to support key economists and sector representatives from Tunisia with how to evaluate the costs and benefits of adaptation and link with the NAPs process.[20] In parallel, nationally-based economists and planners will be trained on technical aspects of data analysis in 40 national workshops. Training workshops will be followed by on-the-job training and in-country field activities to assess the costs and benefits of climate change adaptation. The SCCF financed project will build on the training on the economics of adaptation by exploiting this knowledge to make best ICZM decisions. At the same time, SCCF funds will be used to implicate the tourism and agricultural sectors in the two project zones so that they can provide input and support feasible and cost-effective coastal planning and decision-making by considering environmental and socio-economic benefits.

- The ***Green Economy Initiative (GEI)*** aims to streamline the efficient use of natural resources, to contribute to the promotion of green employment and renewable energies, to promote low-carbon development and to support the development of eco-technologies to the National Strategy for the Green Economy (2016-2036) is focused on these aims with plans to i) provide a higher share of green sectors contributing to GDP, ii) boost green jobs, iii) lower energy and resource intensive production, and iv) reduce levels of poverty. Some of the principle sectors supported by the GEI relevant to the SCCF financed project include the re-use of water, durable construction and support for green

[19] www.gwp.org

[20] North-South and South-South knowledge exchange will be promoted through involvement of international organizations and academia such as NIRAS of Sweden, Yale School of Forestry and Environmental Studies (F&ES) of the USA, FEEM based in Venice, and the Centre of Environmental Economics and Policy in Africa (CEEPA) in South Africa.

industry. In spite of the Strategy and limited applications, the GEI is lacking new strategic sectors of green growth based on the use and exploitation of innovative technologies and the formation of public -private partnerships including the civil society. Also, the GEI is lacking ways to identify financing mechanisms, including taxes, to support the realization of its diverse National Strategy. The proposed project plans to support the GEI by identifying ways to capitalize existing funds. It will also support the GEI's objective of water re-use by developing targeted water management plans for the agricultural sectors in the two project zones. Most significantly, the proposed project will work with the GEI to create a green employment and potentially a green industry by exploring an innovative way to use locally sourced grasses for sand stabilisation (See Component 3).

59. These programmes in combination provide a unique opportunity to address coastal adaptation priorities in the country. However, despite growing commitment and on-going efforts, the baseline projects as described above fall short alone of achieving the long-term solution of integrated coastal adaptation. This is largely due to the fact that up until now, there has been no integrated approach to coastal protection which treats the coast as a whole (as opposed to dealing with site specific impacts under current conditions).

60. The baseline projects which will co-finance the proposed project are detailed below and summarized in Table 4.

Table 4: Co-financing from Baseline Projects

Sources of Co-financing	**Purpose**	**Amount (million) USD**
The National Coastal Protection Programme (NCPP)	The SCCF financed project will build off the on-going coastal protection projects/programmes both government (APAL and DGSAM) and donor financed included under the National Coastal Protection Programme. These programmes are focused on combatting erosion for point locations, monitoring coastal processes and rehabilitating fishing port areas. The proposed project will provide national capacity to conduct project activities using an integrated watershed based approach which considers cross-sectoral data inputs and ensures that natural watershed processes are maintained. Soft methods to combat erosion and prevent sediment build-up will be provided by the proposed project.	55,800,000
The Coastal Protection from Catharge to Gammarth Programme funded by the Saudi Fund for Development	The SCCF financed project will build on this programme's beach nourishment experience. SCCF funds will build the capacity of coastal planning agencies to have more flexible and cost-effective "soft" alternatives in the programme activities which allow for greater resilience of the coast.	18,000,000

Green Economy Initiative	GEI funds will support a market study on the production of palmivelle to serve as a dune fixation soft technique that will serve as green employment and potentially a green industry.	30,000
UNDP TRAC	UNDP is a strategic partner with the Ministry of Equipment, Land planning and Sustainable Development and APAL in supporting several environmentally-related initiatives, including the Initial and Second Communications which focused primarily on coastal changes and risks reduction and led to the first ever coastal adaptation project implemented in Tunisia with support from the UNDP Africa Adaptation Programme. UNDP will be a key partner during project implementation to ensure M&E and successful implementation on-the-ground.	100,000
Total Co-financing		**73,930,000**

2.3.2 Relevant national and regional related initiatives

On-going relevant projects and programmes include the following:

61. **Protection work for the cliffs at Monastir Bay (2nd phase)** (USD 5.9m, funded by DGSAM, 2013-2014) project aims to improve the stability of Monastir cliffs which have been degraded due to landslides and wave attacks. It is expected that the wave action will be amplified with rising sea levels. For this reason, the project aims to stabilize the Monastir cliff with the following actions: a) remodelling the cliff's slope and developing new embankments and berms to increase its stability (soft action); b) creating a set of surface and subsurface drainage structures to limit cliff erosion upstream; c) strengthening of the cliff with physical measures to reduce wave action; d) creation of a breakwater in the front to reduce the energy of the waves on the beach.

62. ***Environment Energy Programme (PEE)*** (USD 1.2m, funded by the European Union, 2009 – 2014)[21]***:*** The two objectives of the project are to i) strengthen the current system of coastal monitoring by acquiring tidal monitoring equipment and buoys and ii) to strengthen APAL's scientific and technical capacities. To date, 2 fixed and 2 mobile buoys were purchased. The aim is to improve the design and operation of APAL's Decision Support System (SIAD). It also has provided training on the maintenance and calibration of equipment as well as with Matlab and Ocean Data View software. Due to the PEE project, APAL has gained experience in

[21] http://www.pr-e-e.org/

working with Metadata and with performing 2D and 3D modelling of ocean currents. The project takes place in the Gulf of Tunis, the Gulf of Hammamet and the Gulf of Gabes.

63. ***IASON*** (20,000 Euro, 2013-2015) European Commission / Seventh Framework Programme: Two relevant goals of this project are to support i) climate change related coastal monitoring and 2) research and innovation to improve resource efficiency, with respect to the management of water and soil.

64. **AMCP et Pêche Durable (**AFD / FFEM, 1 m EUR, 2014-2018) : This project is focusing on the promotion of sustainable and alternative uses of marine fishing in a network of marine and coastal protected areas in northern Tunisia.

65. The ***Cross-border Cooperation in the Mediterranean***[22], ENPI CBC MED is funding 3 projects: 1) Med-Phares (400,000 EUR 2014-2015): This project is focusing on the rehabilitation of lighthouses in the archipelagos of the Galite and Zembra and Zembretta; 2) ***MEET*** (40,000 Euro, 2013-2015): This project is emphasizing the development of an eco-tourism strategy across the Mediterranean and creating an Ecotourism network in protected areas of the Mediterranean; 3) The ***MEDSANCOAST*** (280,000 EUR 2014-2016) project is focusing on innovative models of resource governance of coastal and marine areas for strategic Mediterranean coastal defense.

66. The Tunisian-Bavarian Cooperation is supporting the **Lagune de Boughrara** project (2014-2016, 390,000 EUR) which involves the diagnosis and monitoring of the Boughrara lagoon ecosystem. The **Algues à Djerba** project (2014-2015, 350,000 EUR) includes a study of the algae problem along the beaches of Djerba.

67. ***Integration of climatic variability and change into national strategies to implement the ICZM protocol in the Mediterranean***, MedPartnership (2009 to 2014, 12.9m USD, GEF financed, executing partners are UNEP/MAP, Plan Bleu, PAP/RAC and GWP-Med) is a large marine ecosystem approach project which aims promote the use of ICZM in 12 participating countries as effective tool to deal with the impacts of Climate Variability and Change in coastal zones by mainstreaming them into the ICZM process. With SCCF funds, the proposed project will build off the following aspects of the MedPartnership:

- Component 1: using integrated approaches for the implementation of the SAPs and NAPs including Management of Coastal Aquifer and Groundwater, Integrated Coastal Zone Management (ICZM) and Integrated Water Resources Management (IWRM). Component 1 deals with having a regional consensus on appropriate data sharing for data concerned with climate variability and change. It also deals with the creation of a Multi-country Information Sharing Platform on climate monitoring data in coastal areas.
- Component 2: strengthening the knowledge base on regional climate variability and change including the development of a demonstration project in Tunisia to assess vulnerabilities-impacts & evaluate response options. The MedPartnership project focuses on building capacity of the relevant institutions in the country with tools such as DIVA for assessing impacts and "Climagine" and RiVAMP for finding solutions through participatory processes. It also plans to develop a targeted assessment of climate variability and change impacts and adaptation options for various scenarios.
- Component 3: supporting ICZM protocol implementation by providing tools and reinforcing methodologies for mainstreaming climate considerations into national ICZM planning. In this Component, an integrated management plan will be developed for a demo project site, capacity building will be provided for existing inter-ministerial coordination mechanisms and awareness raising, policy dialogue and capacity building on implications of climate variability and change on national ICZM and water policies will be provided.

[22] http://www.enpicbcmed.eu/programme

68. The ***Arab Climate Resilience Initiative, ACRI*** (2012-2016, 4M USD) developed by UNDP and implemented by UNOPS: The project has three expected outputs including, 1) Institutional capacity to address climate change adaptation and mitigation strengthened, 2) Resilience to the negative impacts of climate change strengthened and opportunities to enhance the production and use of sustainable energy created and 3) Knowledge management, advocacy and awareness in countries of the Arab region on climate change adaptation, mitigation and negotiations improved. The SCCF financed project is highly aligned with the following Outputs:

- Activity Result 1.1 Capacities to access international funding mechanisms in the areas of climate change adaptation strengthened
- Activity Result 1.4, Public-private partnerships (PPPs) catalysed in the three priority areas of water and food security, sea level rise and coastal erosion and sustainable energy
- Activity Result 2.5: Capacity to identify and assess priority population groups, infrastructure and facilities vulnerable to coastal erosion and SLR strengthened
- Activity Result 2.6: Capacity to establish monitoring systems for SLR and land subsidence strengthened

The project is also building off completed relevant projects in the following manner:

69. The ***Africa Adaptation Project*** (***AAP***, 2008-2012), funded by the Government of Japan supported 20 countries in coastal adaptation. The project objective was to reinforce the resilience of coastal development efforts that are impacted by climate change to incorporate CC risks and opportunities into their national development processes in order to protect development gains from CC. For Tunisia, the project was able to achieve 1) the elaboration of a National Coastal Adaptation Strategy, 2) the elaboration of a coastal risk vulnerability map linked to SLR, 3) the development of a concept for a coastal EWS, 4) procurement of buoys and tide gauges, 5) dune rehabilitation with ganivelles along the beaches of Korba, Gabes, Chebba and Djerba, 6) collaboration with 7 NGOs to build CC awareness. The AAP project as a first stage to this project because it was able to produce the vulnerability map which was used to choose the proposed project zones. The SCCF financed project will build on the AAP project by implementing aspects which the AAP was unable to (due to the revolution of January 2011 and associated government changes) and progressing further with coastal adaptation in the two project zones.

70. The ***MEDPRO*** (Prospective Analysis for the Mediterranean Region) project (April 2010 – March 2013, 3 m EUR) was a consortium of 17 highly reputed institutions from throughout Mediterranean funded under the EUs 7th Framework Programme and coordinated by the Centre of European Policy Studies based in Brussels. MEDPRO explored the key challenges facing the countries in the Southern Mediterranean region in the coming decade. Towards this end, MEDPRO undertook a prospective analysis, building on scenarios for regional integration and cooperation with the EU up to 2030 and on various impact assessments. A multi-disciplinary approach was taken to the research, organised into seven fields of study including energy and climate change mitigation. Eleven (11) countries were considered through the MEDPRO work including Tunisia. The Instiut Tunisien de la Competitivite et des Etudes Quantitatives, ITCEQ were a member of the MEDPRO consortium on behalf of Tunisia.

71. Investment Programme in the Water Sector (Programme d'Investissement dans le secteur de l'eau) ***PISEAU II*** (2009-2013). The objectives of PISEAU were 1) to promote more efficient irrigation for the agricultural sector, 2) improve access to water for rural populations and 3) reinforce the Ministry of Agriculture to use integrated decision-making for water resources. Concretely, PISEAU II installed surface and groundwater monitoring equipment and implemented pilot operations to support active management of over-exploited aquifers.

72. The ***Climate Change and Environment Programme, GIZ*** (2006-2011) has the objective of implementing the UNFCCC and Kyoto Protocol in the strategies and development plans for priority

economic sectors. The project had three axes, 1) to support the implementation of sectoral adaptation strategies (agriculture, health, tourism), 2) to support the development of the adaptation legal framework (agriculture / resources water infrastructure / equipment, health, environment, tourism), and 3) to support the development of a concept for an early warning system (EWS) for the management of risks associated with climate extremes and climate change in Tunisia.

2.3.3 National and local benefits

73. This project supports national development goals and plans to achieve Millennium Development Goals (MDGs) 1, 3 and 7.

- MDG 1: Eradicate extreme poverty and hunger – by providing access to financial services and improved forecasts and early warnings marginalized populations in Djerba and in the northwest region of the Gulf of Tunis, they will be able to build resilience to climate shocks. Coastal adaptation measures will reduce sediment transport, keeping ports open for artisanal fishing. Water conservation and recycling measures will eliminate pressure on the already scarce potable water resources and will enable more sustainable irrigation for artisanal farming. The project will also reduce poverty reduction by enabling farmers and fisherman (many artisanal) to continue with their livelihoods and become more resilient to climate change.
- MDG 3: Promote gender equality and empower women – Women will be empowered by enabling them to have access to financial services and to take action to get involved in local coastal adaptation projects.
- MDG 7: Ensure environmental sustainability – The foundation of this project is to ensure environmental sustainability by focusing on building Tunisia's capacity to perform Integrated Coastal Zone Management.

74. Specifically, this project will be support two project zones, Djerba Island (otherwise known as Jerba) and a portion along the Northwest coast of the Gulf of Tunis (See Figure 1 and Annex 3).Of the 52 km of sandy beach in Djerba, there are approximately 22 km along the north east coast (running from northwest at Ras Errmal to southeast at Sidi Yati) that are exploited by the majority of the inhabitants of the island of Djerba and the numerous tourists who visit the island. Vulnerability mapping carried out during the AAP project indicates that Djerba is in danger of losing all its beaches, especially those extending from Sidi Yati to Ras Errmal along the northeast coast, if nothing is done. The activities of Component 2 will specifically address how to maintain and improve the beaches of the NE coast of Djerba and ultimately increase their resilience to the impacts of climate change, in particular sea level rise. Activities will help preserve the important amenity value of the beach area as well as ensuring it continues to function as an effective buffer to natural variability providing a protective function for infrastructure, adjacent land and people. In the case of Ras Errmal spit, which also has a RAMSAR wetland in its lee, important ecosystems functions will be preserved and improved ensuring the ongoing provision of their environmental and socio-economic services.

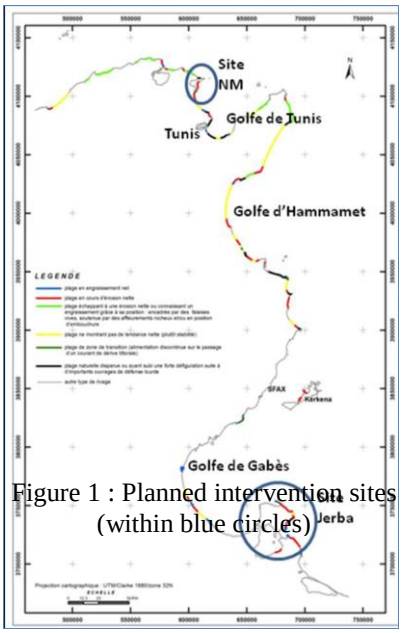


Figure 1 : Planned intervention sites (within blue circles)

75. The two public beaches in Djerba will be direct beneficiaries of the project. The beaches of Sidi Yati (2500m) and Sidi Hachani (2000 m) are heavily used by the local population originating largely from Midoun (35,000 inhabitants) and from Houmt Souk (45,000 inhabitants). Given that these are the

only public beaches in Djerba and it is difficult to attend private hotel areas, approximately 80,000 inhabitants of the island will benefit from improved protection and management of these sites.

76. The project activities at Ras Errmel spit will ensure its ongoing sustainability through an integrated programme for coastal management that incorporates a consideration of climate variability. . The Houmet Essouk municipality organizes controlled visits to this spit which employ 150 people. Improving water quality in the El Hachani area will help the artisanal fishing conditions for 850 families. With an average of 5 persons per family, the total number of beneficiaries for the Ras Rmel spit is expected to be approximately 4,500 people.

77. The project also provides controlled state management along 11 km of the northeast tourist area of Djerba. Hotels directly employ approximately 13,000 people. The surrounding shops, restaurants and other service providers linked to the region employ three to four times more people. Furthermore, at least 5,000 Tunisians who come from outside of Djerba to assist with the tourism sector will also benefit from the planned project activities.

78. The area northwest of the Gulf of Tunis extends over a length of approximately 25 km between Ras Ettarf and the new mouth of the river Mejerda. This stretch of coast is used largely for public swimming, fishing (in the two fishing harbors) beach tourism and agriculture. Based on the available data and the planned program of activities, it is expected that between 8,000 to 10,000 visitors a day in peak summer will benefit from improved management of the Sidi Ali El Mekki and El - Ghar Melh (3 km) beaches. The nearby cities, El Ghar Melh (18,500 inhabitants) and Utica (18,200 inhabitants) use the beaches for employment opportunities during the summer because there are limited opportunities other than agriculture within the region at the current time. If one assumes that approximately one quarter of the city's populations benefit from the beaches, in total, approximately 18,000 people are expected to be beneficiaries of the project. The project will also benefit the port of Ghar el Melah which suffers from silting. The SCCF financed project will support measures to balance sediment transport in the adjacent area and implementing resilience building measures to abate erosion along the shorelines of the inner lagoon to allow continued access to and from the port via the coastal road (currently at risk from both erosion and inundation). Importantly, the Ghar El Mehl Lagoon, a RAMSAR listed wetland, is currently experiencing issues with poor water quality which threaten the range of ecosystems services it supports and have direct implications for the ongoing viability of the fishing industry in the area. The risk assessment and adaptation planning exercise undertaken for the area with SCCF financing will provide a climate sensitive basis for the ongoing, integrated management of the area which will contribute to the overall goal of improving and conserving conditions throughout the lagoon ecosystem. It is estimated that approximately 3,200 from Ghar El Melh will benefit from the project in this respect (a total of 4,400 people in the sector fishing).

79. Furthermore, the project will stabilise the coastal barrier and improve the water quality of Sidi Ali El Mekki lagoon where a few dozen farming families exploit the variation in the level of the tide for irrigation. They practice an original type of artisanal farming which must be conserved due to its uniqueness and cultural importance to the area. The project will support approximately 500 artisanal farmers by improving the circulation of the lagoon (through a combination of activities that focus within the lagoon but also as a result of activities to increase resilience of the coastal barrier which protects the lagoon from inundation by seawater). It will also support approximately 5,000 hectares of agricultural land which, without intervention, are expected to be degraded due to the salinization of surface and groundwater supplies.Overall, based on the data available, the total number of beneficiaries of the project on the northwest coast of the Gulf of Tunis will be approximately 50,000 people and in Djerba it is expected to be beneficial for 100,000 residents and workers.

80. The project also plans to target at least 50% women. As women are equally vulnerable to coastal climate change impacts and they are active in artisanal tasks such as cloisture fishing, the project will be used to boost their resilience. The project will target women to create nurseries to cultivate native plants

which will be used for dune fixation. It will also facilitate women's access to financial services to develop nurseries which will be used to supply the vegetation required in soft coastal protection techniques.

81. On a national and regional level, the central APAL agency and its ten decentralized offices as well as the National Shoreline Observatory will be supported to develop community-driven coastal adaptation plans. This accounts for capacity reinforcement for over 150 administrative and technical staff.

82. Banks and insurance companies will also gain knowledge on appropriate risk transfer mechanisms such as disaster risk insurance and property insurance.

83. On the local level, municipalities and NGOs/CSOs will gain capacity to undertake and monitor coastal adaptation projects. There are 3 active NGOs in Djerba, 2 active NGOs in the northwest zone of the Gulf of Tunis as well as 3 nationally based NGOs which have been involved in the project preparation. It is planned to provide 35 members from these NGOs training on ICZM. Municipalities will also gain knowledge on appropriate coastal adaptation options and how to mitigate or deter future development in designated vulnerable zones.

84. The private sector will also be potential beneficiaries for the project. SCCF funds will be used to create Public Private Partnerships between the hotels and the local community members (NGOs/CSOs) to undertake coastal adaptation interventions. Also, SCCF funds will support a market study to evaluate the feasibility of developing a natural and locally-sourced ganivelle product to aid in dune fixation. The project will explore if a natural form of ganivelle or "palmivelle" can be cost-effectively produced from the nerves of palm leaves to stabilize sand dunes along the Tunisian coast. If there is a potential market to sell the palmivelle domestically and abroad, the Green Economy Initiative will engage the private sector in its manufacturing.

85. Finally, legal and regulatory frameworks will be updated to consider the expected risks of climate change (e.g., sea level rise) so as to influence development and the application of coastal adaptation measures to provide long-term positive benefits for vulnerable coastal populations.

2.4 Project Objective, Outcomes and Outputs/activities

Project Objective[23]

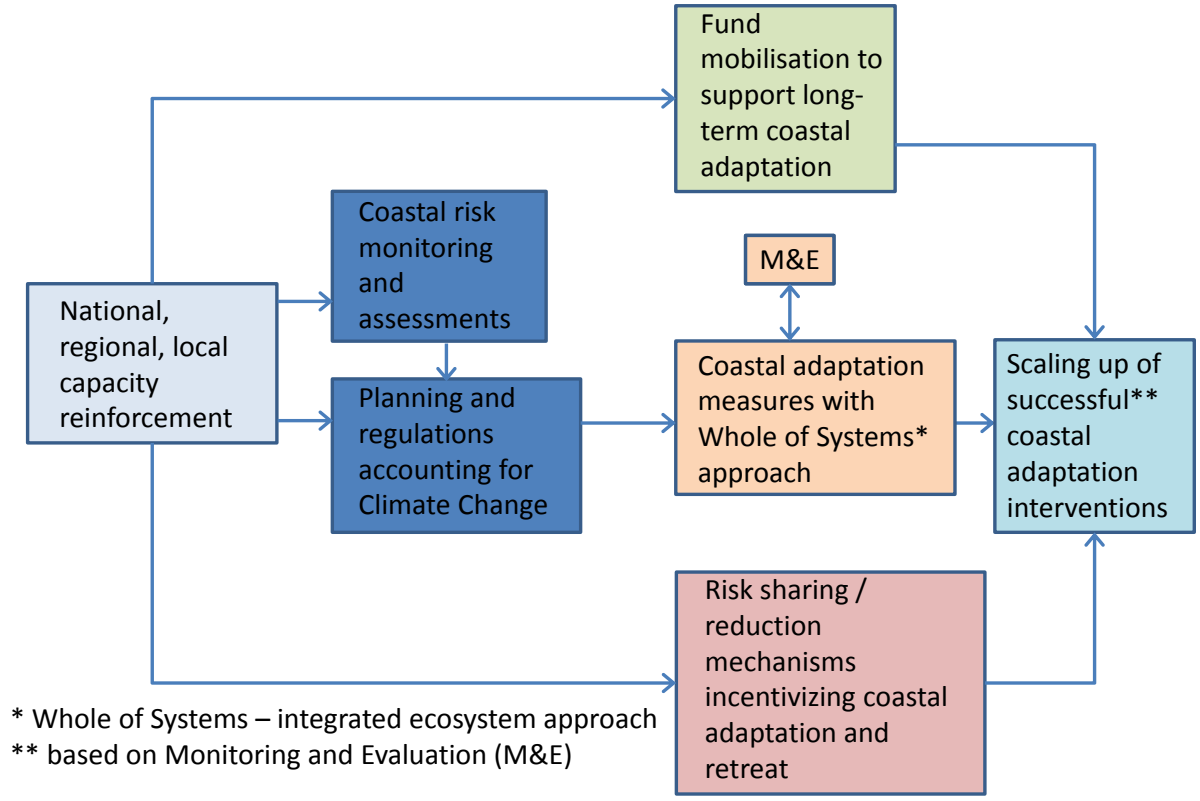
The project objective is to promote innovative adaptation strategies, technologies and financing options to address the additional risks posed by climate change on populations and key socio-economic sectors in Tunisia's most vulnerable coastal areas

Theory of change

86. SCCF financing will provide an alternative to the likely adverse impacts of climate change, in particular sea level rise, by promoting innovative adaptation strategies, technologies and financing options to address the additional risks posed by climate change on populations and key socio-economic sectors in Tunisia's most vulnerable coastal areas. This will be achieved by building national, regional and local capacities to update existing coastal planning mechanisms and regulatory frameworks to deliberately consider climate change. Updates will be based on dynamic modelling, coastal risk monitoring and targeted vulnerability assessments. Planning will be used to facilitate informed adaptation decisions and action using a Whole of Systems approach. Monitoring and evaluation of coastal adaptation measures will support transfer and up-scaling of successful interventions. SCCF financing will also be used to support national and local authorities to implement economic risk sharing and reduction incentives which can

[23] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

minimise exposure of assets to climate change. Simultaneously, financing will be mobilised to support implementation of prioritised coastal adaptation measures in the long-term.



Component 1: Enabling policy and institutional frameworks

Outcome 1: Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved ($660,000)

2.4.1 Baseline Component 1 - Without SCCF Intervention

87. Over the past 15 years, the Government of Tunisia (GoT) has been increasingly realizing the high vulnerability of the coast and has taken significant actions to improve its ability to manage and protect its coastal zones. In 1995 (Law 95-72), the GoT created the Coastal Protection and Planning Agency (APAL), with the aim of achieving sustainable development of the coast by preserving its natural environment and ensuring its integrated management. The mandate of APAL covers protection of sensitive ecosystems, licensing and control over development activities within the maritime public domain (including temporary occupations and concessions), design and implementation of coastal protection interventions, assistance with EIAs, development planning of tourism beaches, management of the National Shoreline Observatory and environmental monitoring and research. It is a financially autonomous non-administrative public entity (EPNA), placed under the Ministry of Equipment, Land planning and Sustainable Development and made up of one central agency, ten decentralized offices and over 150 administrative and technical staff. Its annual operating budget revolves around US$ 16 million (2013).

88. APAL fulfils an important institutional role for coastal management. However, the agency still faces important capacity gaps that limit its ability to address increasing threats from climate change on coastal development. First and foremost, mechanisms for planning and coastal development do not use a

collaborative and integrated approach and consider potential climate change impacts (e.g., sea level rise). Moreover, the existing structure of and coordination between ministries and departments does not promote free-flow of data as well as relevant information for effective, systematic decision making. For example, the existing Environmental Impact Assessment (EIA) process led by the National Agency for the Protection of the Environment does not consider available coastal vulnerability mappings which have been generated by APAL through the AAP project (See Section A.7). An inability to coordinate resources has occurred as a result of lack of funds and a lack of awareness on the activities of parallel ministries.

89. In addition, the existing regulatory framework lacks appropriate policies, strategies, legislative or executive mandates for Climate Change Adaptation in the coastal zone. Regulations and codes governing coastal land and infrastructure development (e.g. Code on Land and Urban Development) are dated back several years or decades and do not account for SLR and associated climate change risks. According to the 2010 National Climate Change Adaptation Strategy for the Tourism Sector, planning regulations require reviewing and strengthening to support the Tourism sector to build resilience to Climate Change. The Strategy recommends that Maritime Public Domain retreat regulations be strictly enforced.

90. Key baseline regulations and planning codes which prohibit the consideration of climate change in accordance with the 2010 National Climate Change Adaptation Strategy for the Tourism Sector and the implication of APAL's scientific findings include:

- The Maritime Public Domain (Domaine Public Maritime, DPM) which refers to the fringe of coastal land that may be used by anyone without restriction. At present, the DPM does not consider sea level rise (SLR) to any extent in spite of conclusions from past studies which have clearly demonstrated its impacts along the Tunisian coast. A study by the Ministry in charge of the Environment and Land Development (2007) [24], aimed to try to understand the changes that may result from seal level rise (SLR) and their impact on the DPM. This study was based on a projected 0.55cm rise in average sea level over the coming century. The study concluded that the DPM must be extended inland to account for necessary conservation and protection of vulnerable coastal areas as well as to account for risks of erosion and coastal flooding. While important, the recommendations in the DPM study are based on projections for sea level rise that came out of a study conducted by the Ministry of Environment and Equipment (2001). As such, they should be updated to reflect the recent state-of-the-art with respect to climate science. For example, the latest scientific outputs from the fifth assessment report of the IPCC (Summary for Policy Makers, AR5[25]) present a worst case scenario of 0.98m SLR by 2100. The appropriateness of an elevated SLR figure[26] should be considered further in studies to inform the incorporation of SLR in the DPM to ensure robust climate proofed decision making in the coastal zone.
- Similarly, the Code on Land and Urban Development (CATU) does not include a consideration of climate change. This Code regulates the organization and operation of spatial planning, creation and development of urban areas, rational use of resources and protection of natural and cultural sites. It is therefore intended to assure coherence between different development programs in terms of infrastructure and procedures for environmental protection. For instance, the CATU is used to weigh urban expansion against the needs to protect natural sites and sustain

[24] Formerly known as the Ministry in charge of the Environment and Development Planning (MEAT), Study on the delimitation of the Maritime Public Domain by considering accelerated Sea Level Rise projections in Tunisia (2007)

[25] IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

[26] Please note it is not explicitly recommended here that 0.98m be adopted by the DPM study. Rather, the relevance of recent projections for SLR for application in regional studies should be considered, in particular with the publication of further Working Group Reports into 2014.

agricultural activities. It adopts both a social and economic perspective to planning, identifying vulnerable zones as per technical advice provided by the Ministries in charge of Land and Urban Development, Environment, Regional Development and Agriculture. CATU states that it "considers natural risks and impacts on the environment." However, it does not specify climate change or any specific risks associated with climate change on the coast. In fact, any development on the coastal zone is restricted to the guidance of the law on DPM.

- Each region of Tunisia also has a Local Agenda 21 which is a sustainable development plan informed by significant Stakeholder consultation. By taking an overview of the region and considering environmental, social and economic resources and constraints, the Agenda prioritizes needs, arranging them on a schedule and chooses the most equitable development plan based on indicators. Although each Local Agenda 21 is site specific, it does not consider the impacts and costs of climate change as well as future scenarios of coastal CC impacts.
- Furthermore, Tunisia's Environmental Impact Assessment regulation, Law 115 of 30/11/1992 and Law 2001-14 of 30/01/2001 and Decree No: 91-362 does not consider coastal vulnerability in its development decisions. Erosion impacts and the effects of Sea Level Rise are not considered in coastal development projects because there is no vulnerability categorization based on scientific analyses embedded within the EIA which can be used to facilitate EIA decision-making. This is in spite of the vulnerability ratings created by APAL during the AAP project. According to Stakeholder discussions, APAL and the National Agency for Environmental Protection (ANPE), which is responsible for EIA decisions, have not had the opportunity or mandate to formalize zoning of coastal projects according to quantified risk.

91. APAL also lacks the proper tools, software and institutional processes to inform key institutions and local authorities of coastal risks and influence key coastal management policy decisions in vulnerable sectors such as tourism and urban development. Both APAL's Shoreline Observatory and National Observatory for Environment and Sustainable Development (OTEDD) accumulate a growing knowledge and information base on coastal processes and changes, however, this information is not targeted to address climate change risks to coastal zone nor is it made available to other institutions in a way that can support effective adaptation decision-making. During the past three years APAL received strategic support from the UNDP in the framework of African Adaptation Programme (AAP) funded by the government of Japan and UNDP. The project helped update coastal topographic profile by a comprehensive geomorphological and coastal sedimentation studies to assist in predicting morphological changes in the coastline over time. However, the AAP risk mapping was too general to provide required specific geo-physical inputs required to serve coastal planning for the two target zones. Consequently, this information is not zone specific to enable a meaningful SLR and inundation risk prediction/mapping for the purposes of designing and implementing targeted coastal adaptation measures.

92. In order to strengthen the capacity of coastal observatory in collecting quality marine data and new kind of data (physicochemical, hydrodynamic, oceanographic and Metrologic), the AAP and PEE (« *Programme Environnement et Energie* » funded by EU) projects provided 3 fixed water wings and 4 small floating water wings. These water wings were placed in the Gulf of Tunis, Golf of Hammamet and Gulf of Gabès. Also, through the AAP project 4 numerical tide-gauges were bought and placed in the ports of Goulette, Marina Hammamet, Sousse and Gabès. Currently, APAL lacks topo-bathymetric profiles to complement this data.

93. A number of tools are currently used in-country to assist the planning process. According to the CATU code (described above), each urban region must have an Urban Development Plan (PAU, Planning d'Amenegemnt et d'Urbanism). Within the plan, an analysis of the effects of implementation of the development plan on the physical and environmental characteristics of the site concerned and the measures to be taken for their protection and development must be outlined. The plan must also provide justification for the urban development options with the guidance of the master development and

legislation related to public easements (e.g., DPM). However, neither the local Agenda 21 nor the PAU mandates the consideration of climate change and its associated costs. They also do not consider future scenarios relative to CC impacts.

94. While the aforementioned tools provide an important start point for a prioritised, integrated approach to environmental planning (despite their omission of climate change considerations) they lack a coherent mechanism to deliver holistic, systems based coastal management. ICZM is the accepted vehicle through which this is delivered both internationally and within the Mediterranean region under the auspices of the Mediterranean Action Plan. The Government of Tunisia recognises the important role that ICZM plays in sustainable development and considers ICZM a high priority. They became a signatory to the ICZM Protocol under the Barcelona Convention in 2008. Despite this commitment to an integrated approach to management in the coastal zone, Stakeholder consultations and baseline research has indicated that little tangible progress has been made with respect to a coherent programme of work for ICZM on the ground. Numerous donor-driven demonstration projects have been undertaken in-country, the majority of which have been affiliated with the RAC/PAP of the MAP and have focused on case studies in several coastal areas. Past initiatives have included SMAP, MEDTAP, MEDWET) and ongoing work is being undertaken primarily through the MedPartnership. While many project outputs and outcomes have been useful at a site-specific and local level, there is limited evidence of attempts to upscale this progress at a regional level or to complement it with a institutional effort to mainstream ICZM within the core business of those responsible for management of the coastal zone. For example, the expressed objective of SMAP III in Tunisia was 'The elaboration a participatory and concerted ICZM plans of action for the region of Grand Sfax to be used as a model for the development of a national integrated coastal management plan'. While the Project produced comprehensive and participated ICZM plans of action, specifically tailored to the needs and potentials of the coastal area concerned, it is unclear how (if at all) the Government of Tunisia used these outputs and outcomes to leverage a platform for ICZM at a national level.

95. Overall, it appears that any attempts to implement ICZM to date have occurred in an ad-hoc manner within different agencies or organizations and little coordination and awareness between the projects/programmes exists. For example, the MedPartnership project (implemented by ANPE) is trying to assist countries in the implementation of the Integrated Coastal Zone Management ICZM Protocol and to support the sustainability of activities through the Barcelona Convention and MAP systems. The MedPartnership is also supporting an ICZM pilot site where they are focusing on preserving ecosystems in the Kerkennah coastal region. However, APAL is not implicated in this critical ICZM project. Furthermore, the MedPartnership also has a regional component to create a data exchange platform for existing data. Stakeholder consultations indicated the MedPartnership is not coordinating with the existing Information System for Decision Aid housed at APAL. Similarly, the Global Water Partnership is helping 12 countries including Tunisia to develop Coastal Zone Management Plans under the management toolkit of Integrated Coastal Area and River Basin Management (ICARM). Although APAL is aware of the project, Stakeholder consultations indicated that APAL is not actively implicated in the project.

96. To date, APAL has not carried out any in-depth study of vulnerable areas considering upstream watershed processes, community priority ranking for areas most at risk and scenarios of CC impacts according to the most recent UNFCCC projections. Overall, thus far, APAL and other key planning authorities, such as the General Directorate for Land-use Planning (DGAT) and the National Environmental Protection Agency (ANPE) have made very little use of adaptation planning methods that could help them idenfity the risks on major coastal investment portfolios and examine costs and trade-offs of different risk management options, such as alternative sitting of tourim structures and strategic retreat vs. protection. This is exacerbated by the fact that APAL currently has limited experience working cross-sectorally, such as with cost benefit analysis for planning. Furthermore, existing monitoring and forecasting functions within APAL and its partner agencies are limited in scope and lack the robustness to

convey relevant inputs to policy makers and tourism developers in a timely manner (e.g., to influence the National Tourism Office (ONTT) and the Tourism Estate Agency (AFT) public-private investment plans).

97. This situation is particularly problematic in the tourism sector which has set an ambitious development target of 7.7 million visitors by end of 2016 by expanding services to Eastern Europe, China, the USA and neighbouring countries. To achieve this, the National Tourism Office (ONTT) and the Tourism Real Estate Agency (AFT) have put together under the 11th Five-Year Plan a public-private investment programme that aims to develop 15 new tourism resorts (hotels, marinas, ports, etc), including the Lalla Hadria project in Djerba.[27]

98. Without SCCF intervention, the technical capacities and skill-sets of APAL and associated organisations (National Observatory) to efficiently conduct, interpret and integrate coastal modelling, climate risk assessment and adaptive measures into shore protection and land-use and decisions is likely to remain limited. Coastal managers in-country lack appropriate tools and techniques to enable effective adaptation decision making, in particular an understanding of climate risk and an appreciation of the economics of adaptation in their coastal zones. They have an understanding of vulnerability as a result of the Africa Adaptation Project outputs (as well as due to other Baseline projects, see Section A.4), however, their understanding needs to be translated into evidence-based assessments of coastal impacts and consequences as well as likelihood of impacts through time. This understanding is necessary if APAL wishes to effectively adopt an 'adaptive pathways' approach to managing the coastal zone in a timed proiritised manner while integrating considerations of climate change. In conjuction, in the absence of more evidence-based, climate-sensitive and stringent regulations for building setbacks, hazards zoning, construction standards or EIA, the vulnerabilty and exposure of on-going and planned development investments (especialy in the residential and tourism sectors) will continue to increase, potentially leading to a steep trend in human and economic losses from coastal disasters.

2.4.2 Adaptation Alternative Component 1 –With SCCF Intervention

99. It is internationally accepted that ICZM can provide an important framework for coastal adaptation bringing together the various local, regional and national stakeholders in improving land use decisions and coastal management practices. Good climate change adaptation within a coastal context is essentially 'good' Integrated Coastal Zone Management (ICZM) with a climate change lens. Although the specifics of implementation of this integrated process may vary from place to place dependent on their unique circumstances, three elements are considered key, namely:

- Appropriate direction-setting guidance;
- Adequate institutional arrangements; and
- Comprehensive coastal management planning

100. SCCF financing will support development of these three key elements to cascade from strategic levels through to those that guide specific operational activities. Nested within this integrated process will be the demonstration of innovative approaches to adaptation which may ultimately be up-scaled and implemented as part of an ongoing programme for sustainable coastal management around the country. The project plans to use SCCF funds so that Tunisia can leverage the Integrated Coastal Zone

[27] The Lella Hadria project is contentious and has not been fully approved. Originally, hotels with an overall maximum capacity of 6,500 beds, a golf course and marina were planned. However, because this site is one of the few naturally preserved areas on Djerba island, ANPE has not permitted the construction of the golf course and marina.

Management (ICZM) approach given its successful role in climate change adaptation endeavours elsewhere and the fact that Tunisia is a signatory to the ICZM protocol under the Barcelona Convention.

101. A key part of supporting ICZM is to reinforce the technical and human capacities within APAL and its partner agencies (DGAT, ANPE, ONTT, OTEDD, AFT and local authorities) to help them better assess and address emerging and anticipated climate change risks on the Tunisian coast. In order to strengthen institutional capacities to conduct ICZM at the local, regional and national levels, the project will support the creation of a national ICZM inter-ministerial platform which will enable coastal projects to be coordinated and resources to be wisely used. The ICZM platform will facilitate decision making on sustainable coastal development balancing decisions with the potential socio-economic benefits of developments. An important role of this platform will be the establishment of collaborative partnerships with the ongoing, donor driven ICZM relevant initiatives in the region (see Global Water Partnership discussion, Section A.4). Specifically, the project will build off the significant work undertaken through the UNEP PAP/RAC in providing advice to MAP countries to integrate climate change within the ICZM protocol through the MedPartnership project (implemented by ANPE).

102. With SCCF funds, all relevant frameworks will also be updated to enable the consideration of future SLR scenarios based on an interpretation of the recently released fifth assessment report of the IPCC. The most up-to-date information available will be used to estimate direct impacts on the DPM and development plans including expected loss of beaches and infrastructure in conjunction with expected socio- economic impacts. A particular emphasis will be put on the improvement of coastal development setback distance, rules and local enforcement capacities so as to more effectively accommodate future changes in shoreline and reduce potential risks on human safety and the built environment. As such, APAL will become more appropriately mandated to protect and sustainably manage development as well as to guide public and private sector investments towards low environmental impact and climate compatible options. Similarly, EIA procedures will be updated to find the best development solution weighing climate risk, environmental, social and economic criteria. It is an opportune time for the proposed project to influence development decision-making because Tunisia is creating a new Environment Code. Through the first component, APAL will gain the expertise to create a spatial delineation of risk (low, medium and high risk zones) which can feed zoning strategies to facilitate EIA decision-making. The risk assessments will also be used in the development of the Environment Code which will act as an over-arching piece of legislation that will have the power to impact development (or the lack thereof).

103. Moreover, the appropriate hardware and software (Output 1.3) for flood modelling (MIKE11) and sediment physical process modelling (SEDSIM and Fortran) will be purchased to have more relevant, site-specific data to support risk assessments. This data will be integrated into the existing Information System for Decision Aid, housed at APAL which will provide better inter-agency data exchange with the development of a databank dedicated to knowledge transfer. With data collection supported by SCCF funds, regular updates in hazard and inundation risk maps will be made to reflect the changing risks of flooding.

104. To support effective decision making based on ICZM in the specific project zones, one risk-based spatial management plan detailing prioritized, cost effective adaptation strategies / flexible pathways will be developed for each of the designated target areas (The island of Djerba in the southeast and the northwest coast of the Gulf of Tunis, See Maps Figure 1 and Annex 3). In order to develop these plans, coastal hazard mapping for the target zones will initially be undertaken. The intended mapping will be used specifically for economic assessment of adaptation options, and will provide a fit-for-purpose product as well as forming the basis for more strategic adaptation planning within the target areas. The AAP project has identified the target areas as potentially subject to erosion and coastal inundation due to climate change. Key characteristics of this work have been the formulation of vulnerability maps that show relative susceptibility to sea level rise, rather than a time-varying projected shoreline position required to inform robust adaptive decision making. A natural extension to the existing coastal

vulnerability studies is their application to coastal risk studies, in such a way as to facilitate decision-making with respect to climate change adaptation.

SCCF resources will be used to conduct a 'second pass' assessment for both the target areas (East coast of Djerba and Northwest of the Gulf of Tunis) to refine the choice of coastal risk assessments to be conducted and confirm the cost-effectiveness of adaptation plans. The choices will take into account adaptation economics principles and use different techniques in cost-benefit analyses including a "real options' assessment method[28] to help planners better understand how the outcomes of integrated coastal management (based on data from geomorphology, hydrology, ecology, population dynamics and economics, etc) for a potential new coastal management "alternative," (e.g., hard (breakwaters) or soft (dune fixation) coastal adaptation measures) might vary across climate change scenarios (For more detail, see Annex 3). In doing so, results from these assessment methods will provide the appropriate timing and prioritization of adaptation investments.

105. The site-specific analyses of climate risks and adaptation will provide a view to guiding the adjustment of local shoreline management policies, long-lived infrastructure projects (e.g. dikes), spatial and land use plans (*Schéma Directeur d'Aménagement Regional; Plan d'Aménagement Urbain*) as well as disaster risk reduction strategies (e.g. flood plans). The expected outputs include the identification of the most effective adaptation options (including protection, accommodation and managed retreat) and technical solutions to strategically managing coastal processes and hazards (e.g. flood and erosion) in the short and long term.

106. All land use development decisions will be based on careful analysis of costs and benefits under a range of impact scenarios. Socio-economic assessments will help demonstrate the cost-effectiveness of certain adaptation measures, such as dune stabilization, groundwater conservation, wetland restoration, or using vulnerable lands as natural preserves or for low value uses, as opposed to solely ''hard'' structural responses. The project plans to work with other regional programmes (the MedPartnership and the Global Water Partnership) to reinforce national capacities to perform economics of adaptation analysis. With this capacity, national focal points will have the ability to detail long-term options across sectors (both public and private) which can be used for coastal adaptation to manage the inherent uncertainties of climate change.

107. The final output of Component 1 will be the development of a guidance package for local authorities including the tourism (Djerba) and agricultural (Northwest Gulf of Tunis) sectors on coastal risk mitigation options. All coastal risk mitigation options will be based on the management plans and economic analyses generated throughout the project. The package will include a series of evidence-based recommendations for the tourism sector to ensure flood and erosion protection of the physical infrastructure in compliance with spatial plan and coastal zoning regulations. To facilitate the implementation of coastal risk measures, targeted awareness building will be used to effectively communicate the options so that they can be easily understood.

108. Specifically. SCCF funds will build on the above mentioned baseline projects (See Section A.4) in the following manner:

- Build on the support for ocean monitoring, Decision System Support (the SIAD) and equipment calibration and maintenance provided by the ***Environment Energy Programme*** of the Union European

[28] The Real Options assessment method to be introduced, in the climate change context, will provide an evaluation of possible futures so that investment decisions to implement adaptation measures can be timed and weighted. Through this method and linking with CC scenarios, it will be determined whether it is worthwhile to implement part of an adaptation measure which can be upgraded to a higher level in the future or to avoid implementation of a cost-intensive protective measure if the climate risk is not expected to change significantly.

- Build on the ***MedPartnership***'s experience in data sharing and on the MedPartnership's training for specific coastal software for assessing impacts (DIVA). It will furthermore, use lessons learned on the development of an integrated management plan for another coastal pilot site.
- Build on the training workshops, on-the-job training and in-country field activities from the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** project (2013-2014) to assess the costs and benefits of climate change adaptation. Both the proposed and ***Economics of Adaptation*** projects will work together to provide joint training sessions to reinforce national capacities to evaluate different adaptation investment options.

109. The SCCF financed project will also build on relevant projects in the following manner:

- Integrate the lessons learned on climate change related coastal monitoring from the ***IASON*** project when procuring and placing new data collection equipment.
- Build on the ***Tunisian-Bavarian Cooperation*** and their monitoring studies of lagoon ecosystems, particularly their study of the algae problem along the beaches of Djerba. The SCCF financed project will use this ecosystem information when developing site-specific ICZM plans.
- Coordinate with the ***Arab Climate Resilience Initiative (ACRI)*** to build on the capacity building they will provide to identify and assess the most vulnerable groups to coastal erosion. Information on vulnerable groups will be an integral component of coastal management plans because the foundation of ICZM is to ensure Stakeholder input is collected on perceived risks. Furthermore, SCCF funds will be used to build on the knowledge gained through ACRI on how to establish appropriate monitoring schemes for SLR and land subsidence.

Output 1.1: Regulations and enforcement mechanisms governing coastal land use and EIA strengthened to include climate risks management requirements, with a particular focus on siting and construction of infrastructure and tourist facilities

Indicative activities include:

1.1.1 Revisions to the Maritime Public Domain (DPM) regulation in order to take into account the effects of SLR for low-lying coastal areas.

1.1.2 Revisions to the Code of Planning and Urban Development (CATU) so that coastal cities can mitigate and manage SLR and erosion and inundation risks by considering the identification and consideration of necessary setbacks and easements.

1.1.3 Revisions to Tunisia's Environmental Impact Assessment law to mandate project submissions to consider erosion impacts and the effect of SLR by incorporating zoning based on risk

1.1.4 Integration of SLR and coastal impacts in the new Environment Code

1.1.5 Development of best coastal management practice guidelines to feed cross-sectoral strategies including:

- Siting of tourism structures including boundary delineation and strategic retreat recommendations
- Capacity limits (number of buildings/people per unit area) in vulnerable areas

1.1.6 Creation of a national ICZM inter-ministerial platform to coordinate projects, strategies and programmes involving the coastal zone and to facilitate decision-making on sustainable coastal development balancing decisions with the potential socio-economic benefits of developments. The national ICZM platform will consist of focal points from APAL, the Ministry on the

Environment, the Ministry of Investment, the Tourism boards (ONTT, AFT) and locally-based NGOs/CSOs. It will collaborate with regional ICZM initiatives such as the Global Water Partnership, the MedPartnership, PEGASO and UNESCO-IHP.

Output 1.2: Advanced coastal risk assessment and adaptation economics tools for planning introduced at 4 planning authorities (APAL national and 2 regional branches, Bureau of Tourism and the regional governments) delivered to 200 key technical staff and decision makers for them to understand and respond to the impacts of climate change induced risks/disasters on coastal infrastructure, economies and livelihoods

1.2.1 Identification and verification of vulnerable areas in relation to SLR for future development by making a data inventory and spatial intersection between projected development areas in relation to the AAP vulnerability map and community priority ranking for areas most at risk

1.2.2 Development of 'real options' simulations demonstrating the risks linked to climate change (CC) on infrastructure, economies and livelihoods based on a range of CC scenarios

1.2.3 Development of a guidance package for national, local authorities and tourism sector representatives on coastal risk mitigation options

- Climate-resilient construction (location, design, energy reduction methods, etc)
- Retro-fitting of existing infrastructure to improve climate resilience

1.2.4 Reinforcement of planning capacity at the national and sub-national level on the economics of adaptation (cost benefit analysis for sectoral planning/investment appraisal) for 20 multi-sectoral representatives including APAL, ANPE, NGOs, CSOs, municipality representatives, tourism operators, port representatives and the Federation of Insurers

Output 1.3: Hardware and software delivered to improve observation capacities, data collection and treatment (topographic and bathymetric surveys, MIKE11 flood and coastal surge modelling software and SEDSIM, Fortran for sediment process modelling)

1.3.1 Strengthening and development of the Information System for Decision Aid (SIAD) with the collection of altimetry and oceanographic data including

1.3.1.1 Bathymetric topographic surveys for the Sidi Hachani and El Kastil Jerba sebkhas (2,000 hectares), the lower area of Ras Terbellah and the Jilij sebkha (2,000 ha)

1.3.1.2 Two (2) surveys conducted at a 3 year time interval along the coast line of Ghar El Melh to the new mouth of the Mejerda (1,000 hectares)

1.3.1.3 Baseline imagery data based on a high resolution satellite image of the coastal strip of land 500 m from Sidi Ali El Mekki to the present mouth of the Mejerda (25 Km)

1.3.2 Development of a field analysis plan and oceanographic indicators for processing data acquired by the coastal monitoring network

1.3.3 Acquisition of hydrological software for simulation of floods and coastal surge (e.g. MIKE11) and software for erosion including Fortran and Sedsim (Sedsim simulates the physical processes that deposit, erode and rework sediments in space and time)

1.3.4 Development of a detailed 5 year Action Plan for improved operation of the SIAD including the creation of a databank to facilitate data exchange

Output 1.4: In at least 2 vulnerable coastal regions and municipalities (Northern coast of Tunisia and Djerba), spatial plans (Agenda 21, PAU) developed based on impact scenarios, shoreline management planning and cost-benefit analysis of adaptation options

1.4.1 Development of 1 risk-based spatial management plan detailing prioritized, cost-effective ICZM and adaptation strategies / flexible pathways for each project zone, targeting the municipalities and the agricultural (northwest coast of Gulf of Tunis) and the tourism (Djerba) sectors

1.4.2 Updates to the Agenda 21 local sustainable development plans for the Northwest area of the Gulf of Tunis (Kalat El Andalous and Ghar El Melah) and Jerba to consider potential financial, environmental and social impacts and integrate community viewpoints based on Stakeholder consultations

1.4.3 Revision of spatial management plans (PAU) based on cost-benefit analyses for the target regions

Component 2: Replicable adaptation measures in the target coastal sites

Outcome 2: Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 22 km of coast and 670 hectares of wetland and benefiting 150,000 inhabitants ($4,000,000)

2.4.3 Baseline Component 2 - Without SCCF Intervention

Shore protection to mitigate long-term risks from SLR.

110. Coastal hazards resulting from SLR and climate change, such as increasing erosion, water stress or extreme storm surges and floods, are priority concerns for the GoT and have prompted a number of critical national and international baseline investments. For example, the Coastal Protection Programme, Phase I (15 m EUR, 2013-2017, Kerkennah Raf Raf) and Phase II (7.9 m EUR, 2014-2018, Sousse Nord /Hergla Rades / Soliman) are being supported by KFW in Tunisia. The main objective for both phases is the ecological and economic rehabilitation of coastal sites in Tunisia to protect against sea erosion. The four components of the project include 1) enabling access to the sea through ramp construction, 2) Achieving watertight protection against seawater intrusion in Elataya, 3) the development of pedestrian and bicycle routes and 4) planting vegetation adapted to the coastal environment. A team of coastal experts is housed within APAL to support the design and construction of techniques to protect the coast from erosion. The projects plan to perform point coastal protection measures. For instance, in Kerkennah, landscaping will be done in a few places behind seawalls to help prevent marine erosion. Also, the project proposes to use hard construction measures, namely seawalls to prevent against seawater intrusion in El Attaya. The two alternatives currently being studied include a dam with a concrete core and a dam with a clay core.

111. APALs current programme of work also includes several site specific coastal projection projects, such as that for the area from Catharge to Gammarth which focuses on implementing hard coastal protection measures (Saudi Fund for Development (loan), 2013-2015, 13 m EUR) and development work in the coastal zone of the Monastir Bay (1st phase) (funded by APAL, 2014-2015, 10m TND) – This project involves sand nourishment in several sites. It also includes the construction of hard coastal protection measures such as dikes and canals. Overall, APALs Programme of Coastal Protection against sea erosion pertains to approximately 100 km of the Tunisian coast.

112. Despite a commitment to climate resilient works and a growing willingness to use ‘innovative’ approaches, the existing and baseline projects will fall short of achieving the long-term solution of coastal adaptation without SCCF intervention. This is largely due to the fact that there is no integrated approach

that retains ecosystems services at its core and includes a systematic programme of works to treat the coastal area as a whole (a Whole of Systems approach, as opposed to dealing with site specific impacts under current conditions). It is clear that the project portfolio to build coastal resilience largely entails the use of coastal erosion control measures to treat existing issues rather than a coordinated effort to reduce coastal risk into the future with the unequivocal influence of sea level rise. The only project in the current baseline portfolio that deals with soft protection measures is the work being co-funded by KFW. However, this work tackles a site specific issue while helping prevent marine erosion in a few locations behind existing coastal seawalls. This effort is largely targeted at one predetermined location and does not consider the watershed as a whole, noting upstream and downstream impacts on the hydrology of the catchment. .

113. Previous bad experiences with hard coastal protection measures have been well documented (e.g. disfigurement of the landscape, accumulation of algae, eutrophication of waters in areas enclosed by breakwaters, uneven redistribution of sediments, aggressive erosion adjacent to long shore protection works etc.). On the basis of this information, APAL began to investigate the possibility of using new flexible methods for coastal erosion projection as early as the late 1990s. Despite the early undertaking to find 'a better way' to protect the coast, diversified experiences with innovative techniques in-country remain relatively limited and have focused on the isolated application of wooden palisades as a means of stabilising the upper beach, replenishment of the beach with additional sediment and stabilisation efforts using sand filled geotubes (See Annex 2a and Annex 7, Prefeasibility Study, Soft Measures Implemented). The key issue in applying these 'new' techniques has been inherited from the previous 'hard' engineering regime. Namely, implementation has occurred in relative isolation without a supporting framework or programme for management and with no recognition of the interconnectedness of the wider coastal system. As a result, while they may provide a measure of short term gain (in terms of volume of sediment along a particular area of the coast) they have not contributed to the long term resilience of the coastal zone in a meaningful way.

114. Ganivelles (wooden palisades) employed at the Radisson at Ras Errmal spit in Jerba as part of the recent AAP project provide a good example of this situation. The ganivelles are a potentially useful way of causing reduced wind erosion, thereby enabling a steepening of the beach, which means less landward transport and hence a 'wider' beach for the same volume of sediment. However, they will not be effective in the long term at this site due to inappropriate spacing and fencing heights being used.[29] The palisades as part of the AAP project were not subject to any ongoing maintenance or coordinated monitoring and evaluation. Based on anecdotal evidence from field visits through the project preparation phase it seems that ad hoc photo monitoring of the area is occurring, but this information is not being collated in a systematic manner or evaluated to inform the decision making processes with respect to local coastal management.

115. Overall, with most coastal protection interventions, success has been limited and replicability of interventions is hindered by a lack of coordinated maintenance and Monitoring and Evaluation (M&E) to profile the effectiveness of strategies employed. The lack of integration within an overall management framework mean that interventions have no medium to long term sustainability and are more often than not short term solutions for current issues at an isolated 'point' along the coast. Measures implemented may appear to have achieved success in the short term (e.g. halting erosion of immediately adjacent coastal land) but their long term contribution to resilience building is unsubstantiated at best and counterproductive at worst.

116. In summary, while the baseline efforts with respect to shoreline protection in-country appear encouraging and helpful, they are unlikely to be sufficient to deal effectively with the magnitude and

[29] They would be more useful at half their current height and double the density. A low broad weave netting fence or a more continuous (e.g. heshian) fence would likely work better. At present, they act mainly as pedestrian/traffic barriers.

specificity of the climate change threats in coastal areas. In absence of SCCF support, there will be limited applications of cost-effective and proven practices to increase coastal resilience in the medium to long-term. As such, despite the early steps made to introduce more resilient and soft defence approaches such as beach nourishment, the APAL's coastal protection programme would continue to be dominated by costly and short-sighted hard engineering solutions.

Technical capacities, institutional functions and associated budgets in place at the APAL

117. Furthermore, there are important capacity gaps for APAL both in terms of designing and implementing appropriate climate-resilient erosion control methods. For example, the technical studies underpinning the design of the APAL's protection and beach nourishment solutions were conducted before the completion of the SNC V&A analyses and do not sufficiently take into account the latest scientific understanding of sea level rise and changes in local hydro-sedimentary conditions. As a result, a critical part of the investments planned could be lost or rendered inefficient in the near future. At the same time, the programme is focusing almost exclusively on one type of strategy (mix of infrastructural and beach nourishment techniques) and does not consider a more diversified portfolio of new, flexible and 'climate-smart' non-structural measures, such as bio-engineering, that can better maximize coastal ecosystem functions and services as natural protective mechanisms and provide greater robustness to all plausible SLR impact scenarios in a broader range of socio-economic and bio-physical conditions.

118. APAL is also lacking the technical and operational capacity to monitor and upscale successful pilot tests. There have been isolated point interventions for coastal protection and management with no lessons learned captured. The lack of established M&E systems prevents new insights to be integrated into coastal planning so that they can be applied for subsequent projects. Combined with the lack of a M&E mechanism is that APAL requires training on how to apply oceanographic data to substantiate good coastal practices. APAL has limited knowledge on physical oceanography and 2D/3D modelling of the marine environment to ensure that ICZM is having a positive impact. Furthermore, although various projects assisted APAL in the procurement of coastal monitoring equipment (PEE and AAP), APAL is not trained on how to maintain or budget for existing equipment so that monitoring can take place in the long-term.

Management of the coastal freshwater aquifer

119. Aridity combined with high climatic variability and high anthropic pressures are characteristics of Tunisia, a water-stressed country. Climate change is predicted to exacerbate Tunisia's water problem. Average fresh water per inhabitant is predicted to drop from 450 m3/inhabitant/year to 350 m3/capita by 2030 (MARH and GIZ, 2007).

120. Tunisia's coastal zones are particularly vulnerable to the lack of fresh water resources and climate change; sea level rise induced by climate change is causing intrusion of saltwater resulting in the degradation of water quality. The potential loss in coastal groundwater resources caused by saltwater intrusion is estimated at 53% of the current groundwater reserves (MEDD and UNDP, 2009).

121. Agriculture, industry and tourism are vulnerable sectors to the decrease of available fresh water sources due to salinization. In fact, 81% of all water resources are used for agriculture and 1% for tourism (MARH and GIZ, 2007). The costs related to water degradation in Tunisia amounts to 0.6% of GDP with irrigated agriculture, overexploitation of groundwater and tourism causing the greatest costs. The loss in agricultural production amounts to 81 million TD per year (2% of the agricultural GDP) owing to the submersion of farming land and the loss of irrigation potential caused by salinization.

122. The lack of freshwater availability is not new to Tunisia. In 1992, the Ministry of Agriculture developed a national programme aimed at substantial water savings through the development of nonconventional water resources, including the reuse of treated wastewater and the direct use of brackish water. Agricultural land, which is often found near the coast, has been equipped with water-saving technologies since 1995. Nonetheless, the volume of wastewater effectively used only in irrigation is well

below the volume of available treated wastewater. Therefore, according to the MEDD 2012, it is necessary to apply unconventional water sources, particularly for water intensive sectors such as agriculture and tourism.

123. The Tourism sector is well aware of the need to address limited available water resources. In Tunisia's National Climate Change Adaptation Strategy for the Tourism Sector (2010), it is recommended to consider long-term constraints on water resources and to improve water resource planning. The Strategy states that alternative sources such as rainwater and treated wastewater must be adopted.

124. In practice, the former PISEAU project (See Section A.7) supported efficient use of irrigation water. Along the northwest coast of the Gulf of Tunis, one of the project sites, land is already irrigated with Treated Wastewater (TWW). However, in spite of these advances, the agricultural sector is still subject to significant salinization which hinders crop production. Similarly, the water resource situation is dire in Djerba. In fact, the GoT has begun investing approximately US$90 million in Djerba for the construction of the country's biggest seawater desalination plant to secure the island water supply in the face of fast growing demand and depleting aquifer resources. The stations of Gabes with a production of 30000m^3/day, Gallala (Jerba) - 15 000 m^3 / day and the resort of Zarzis - 15 000m^3/day are planned in the framework of this investment programme.

125. Similarly, private hotels are already taking action in Djerba. Stakeholder consultations during the project preparatory phase indicated that at least 4 of the hotels in the project site have installed individual desalination units. Some are also practicing forms of water recycling. However, the quantity of hotels actually taking action to treat or recycle water is few compared to the current number of hotels and the hotels which are planned.

126. Overall, even with these important interventions on using treated wastewater to irrigate farmland and the use of desalinated or recycled water to support tourism in both project locations, insufficient financial and technical means have constrained the implementation of climate-resilient irrigation and water management measures. Lessons learned from the hotels who are actively trying to manage water sources for their private cost savings must be shared throughout the tourism and even residential sectors. Also, alternative water treatment/recycling measures as well as more water efficient irrigation practices need to be explored in both project sites. Evaluating and testing new water resource management options is mandatory in order to continue to provide for the current and increasing demands of water for tourism. Similarly, as agriculture is already the most water-intensive sector, other water savings options for irrigation are required to be studied and pilot tested.

Coastal risk monitoring and early warning system

127. Climate change has already manifested itself with more severe, even torrential storms and downpours that are less absorbed by soils and which have caused significant erosion.[30] The indirect effects owing to extreme weather events include an overexploitation of underground resources in order to compensate for the deficit in surface water for irrigation. In response to the direct and indirect impacts from extreme weather conditions, the government has put an early warning system high on its agenda. Along the coast, alerts are planned to be used for seismic disturbances (tsunamis), flooding, coastal surges, strong winds and marrobbios[31].

128. As a first step towards improved observation and forecasting capacity, the Ministry of Agriculture and Environment with support from the GIZ Climate Change Assistance Programme, developed a concept plan for a national climate change multi-hazard monitoring and early warning system. Some initiatives such as the Environment Energy Programme and the Africa Adaptation Programme (described in Section A.7) have provided coastal monitoring equipment to support alert generation.

[30] MEDD and UNDP, 2009

[31] Waves caused by rapid and unusual changes in atmospheric pressure in confined areas

129. In spite of these initiatives, additional technical assistance, capacity building and investments to address the specific monitoring and information needs of the coastal region are required. Also, it is necessary to operationalise a practical and replicable alert model at the local level.

130. Presently, the network of oceanographic buoys recently deployed by APAL can transmit weather and ocean data in real time. Also, the data transmission platform is operational. However this data is not yet linked to an alert system, including an existing operational regional alert system for tsunamis. This regional early warning system can provide arrival time estimates for tsunamis and inundation maps. However, the alerts and products from the regional centre are not downscaled to suit Tunisia and updated by Tunisia specific observations. Furthermore, the spatio-temporal resolution of data sources should be improved and must be adapted to each phenomenon affected by the forecast.

131. Forecasts and alerts for other events (storms, coastal surges, flooding, high winds) are not yet possible because data exchange with other technical stakeholders such as INM, INSTM has not been established real-time. Also, there is no standard communication protocol to generate alerts and disseminate them in a timely manner to civil protection authorities and ultimately to local communities.

2.4.4 Adaptation Alternative Component 2–With SCCF Intervention

132. The SCCF financed interventions will apply an integrated approach to coastal management by introducing a range of tools, required skills and expertise for coastal erosion and inundation mapping, climate change risk assessment and adaptation planning. Risk information to be collected in Component 2 will support the risk-based spatial management plans to be developed in Component 1. The optimal adaptation pathways as indicated by the plans will be implemented in Component 2 on specific high risk coastal locations (at Djerba and the northwest Gulf of Tunis).

133. A systemic and proactive approach of coastal adaptation will be demonstrated in pilot activities. This will contrast with the interventionist and reactive nature of existing attempts to manage the coastal zone in Tunisia which have permeated the concept of adaptation as a 'last resort' in dealing with the threat of an unpredictable climate. The "beginning-of-the-pipe" role for natural habitats and a coastal system[32] adopted through this project will create new opportunities for more flexible, systemic and responsive outcomes that address climate change and the need for improved human wellbeing. The preferred approach will also harness the full potential of natural systems to ensure a sustained quality of life.

134. Specifically, the SCCF financed project will provide direct investments for advanced and climate resilient coastal protection options with a Whole of Systems approach at its core, considering the current coastal land use practices and future priorities, geomorphological specificities of the coastline and a range of plausible scenarios of SLR impacts. It will pilot in two priority areas (north-western coast of Gulf of Tunis and Djerba) a set of non-structural and bio-engineering shoreline protection methods that go beyond beach nourishment to address erosion and storm surge processes in a greater variety of socio-economic and geomorphologic settings (low-lying agriculture and urban areas, wetlands and beach strand zones).

Northwestern coast of Gulf of Tunis

135. The specific framework adopted for the design and implementation of these measures at the Gulf of Tunis is the Whole of Systems approach[33] where "Living Shorelines" will be implemented along

[32] Roberts et al. (2011) http://eau.sagepub.com/content/early/2011/11/28/0956247811431412.abstract?rss=1

[33] The Whole of Systems (WOS) approach can be defined as the integration of multi-disciplinary knowledge and the idea of coastal spaces as a whole, including the complex relations between maritime and terrestrial systems. Through such an approach, changes in coastal geomorphology (i.e., beach and dune systems) are considered along

targeted reaches of the Ghar el Mehl lagoon and on the Sidi Ali El Mekki lagoon barrier. 'Living Shorelines' have been successfully carried out for protection of sensitive coastal areas in other Mediterranean countries (France, Spain and Italy) and are being used in Egypt's Nile Delta with support of SCCF. This approach focuses on an innovative set of bank stabilization and management practices that act as erosion-control and storm-surge-protection functions by providing for long-term restoration, maintenance or enhancement of natural habitats and coastal processes.

136. The focus of activities will be the Sidi Ali El Mekki Lagoon area. The SCCF financed adaptation alternative will focus on the area in and around the Sidi Ali el Mekki lagoon (See Maps Annex 3) with a view to demonstrating the effectiveness of a Whole of Systems approach to coastal erosion prevention to facilitate healthy, naturally functioning ecosystems that act to reduce the risk of projected changes in climate, in particular sea level rise which can be up-scaled across the target area. This area is a unique and important ecosystem that provides an excellent opportunity to employ an integrated approach across the exposed ocean coast and sheltered inner lagoon. The activities proposed will address the ongoing stability of the coastal barrier and the public beach heavily used by tourists and pressurised by illegal development in the dune area, extraction of sand in the beach area and stagnation of storm water in depressions that subsequently form along the back beach. The infilling of illegally cut channels in the barrier which have resulted in sediment loss to the inner lagoon will also contribute to increased barrier stability while decreasing sedimentation in the lagoon and contributing to improved water quality.

137. The threat to traditional agriculture practices in the inner lagoon will be addressed through activities to improve flushing and water quality (directed near the entrance in the south) and activities to increase shoreline stability with a combination of barrier and shoreline consolidation techniques that employ indigenous materials. The SCCF alternatives will be based on good-quality information on what impacts are occurring now, their location and the groups and systems most affected as well as reliable estimates of the impacts to be expected under projected climate change. Early warning of potentially alarming or irreversible impacts will be made possible in conjunction with an estimation of different risks and opportunities associated with a changing climate. Importantly, effective approaches for identifying and evaluating both existing and prospective adaptation measures and strategies, credible methods of costing different outcomes and response measures, and an adequate basis to compare and prioritise alternative response measures will be provided. This will ensure the ongoing viability of the socio-ecological system through the adoption of a single integrated approach for the analysis of both social and economic agents and the natural components of the ecosystem.

Northeast coast of the Island of Djerba

138. Past and current management efforts along the coast of Djerba are largely reactive attempts at coastal protection using 'hard' measures. Systematic coastal planning is absent and ad hoc attempts by hotels to protect their coastal assets have often increased erosion along adjacent stretches of the coast. Sandy beaches are fast disappearing and there is a lack of public open space in the coastal zone. The remaining 'natural' strips of sandy beach on the island are in poor condition and require urgent rehabilitation. The ongoing misuse of the coastal sediment budget in the vicinity of tourist infrastructure will have repercussions for the sustainability of these natural spaces. That is, ongoing failure to adopt a Whole of Systems approach to management of the coastal zone will lead to increased degradation and ultimately disappearance of the beaches, dunes and wetlands that make up the north east coast of the island.

139. The adaptation alternatives proposed by the SCCF financed project for Djerba will facilitate an important shift in mentality towards integrated, systems based management that retains ecosystems

with changes in the surface water and groundwater systems for example. The goal of the WOS approach is to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics so that a sustainable outcome can be achieved.

functions and has a clear adaptation goal at its core. This will entail preserving the natural coast in a highly developed area by recognizing the importance of the sediment cell and implementing integrated activities across the system. The outcome of these activities will be the demonstration of cost effective, proactive erosion control to hoteliers that is sustainable and ecologically sensitive while conserving Ramsar wetland (at Ras Errmal spit) and public open space (Sidi Yati public beach).

140. This SCCF alternative for the north east coast of Djerba provides an important opportunity to deal with the trade-offs between short term benefit versus long term gain; while it may be unregulated, the tourist infrastructure that exists along the coastal zone is the backbone of the economy and it is important to employ adaptation techniques in this area now to preserve what natural coast is left and give options into the future. The preferred solution for the coast is a medium to long term strategy employing risk based spatial planning that ultimately encourages tourist infrastructure to retreat to allow natural coastal processes in the coastal buffer (setback) or relocate in areas that are extremely high risk (following demonstration of cost benefit). However, this takes time and in the short term it is important to retain as much natural coastal function as possible which means demonstrating an alternative to the ad hoc 'hard' solutions that have been favored in the past. The activities proposed for the north east coast demonstrate to the hotels that a proactive approach of dune building and beach rehabilitation using local materials such as the native palm trees and posidonia grasses will provide them a higher degree of asset protection than the unsustainable approach they currently employ (e.g. dumping builders rubble in the back beach area destroying natural ecosystems function and building ineffective seawalls that have resulted in loss of the beach seaward at several locations). It is also intended to mitigate the mismanagement of the coastal sediment budget in the vicinity of the hotels to provide transferrable benefits to the remaining natural coast in Djerba. That is, the project acknowledges the interconnectivity of the coastal zone and in particular the importance of the consideration of sediment cells in any coastal adaptive strategy. It recognizes that effective adaptation along the coast requires, at its core, an appreciation of sediment transport pathways both now and into the future with the likely addition of sea level rise.

Technical capacities, institutional functions and associated budgets in place

141. Another key component to ensure sustainability and replicability of proposed activities will be a site specific monitoring and evaluation programme to facilitate 'adaptive' approach through the life of the project ensuring ongoing maintenance of the interventions implemented and a subsequent appraisal of effectiveness in the specific coastal systems context. In this manner, the SCCF demonstration activities will establish sustainable adaptation efforts to highlight an integrated approach, and showcase the effectiveness of 'soft measures' integrated within a Whole of Systems approach to adaptation with significant M&E to allow successful transfer and up-scaling around the country.

142. Capacity building for networks of NGOs in both project locations will be provided so that they can support APAL with coastal adaptation practices. Combined with Component 3 which will mobilise funds for community level adaptation, Component 2 will empower the communities so that they understand good ICZM and can assist in the design, installation and tracking of resilience building coastal projects.

143. Furthermore, the project will provide APAL with the technical and operational capacity to monitor and model the coast. They will receive technical assistance in physical oceanography and database management of oceanographic data. They will also receive capacity building in the maintenance of equipment and instruments (e.g., buoys and tide gauges) as well as the means the plan and budget for the operation and maintenance of monitoring equipment.

Management of coastal freshwater aquifer resources

144. The project will also explore and test integrated water treatment and management practices in both project regions that will minimize pressure on current, limited freshwater supplies. By reusing and recycling the existing water resources at disposal, SCCF funds will promote less groundwater extraction and effectively minimize SLR-induced sea water intrusion and salinization. Currently, the water intensive agricultural sector uses shallow and deep wells in Djerba for irrigation. In the Northwest part of the Gulf of Tunis, the majority of land (2,300 ha) is irrigated by transporting water from the Mejerda River. Approximately one-third of the agriculture (700 ha) is supported by irrigation with Treated Wastewater (TWW).

145. To detail best water management practices in the agricultural areas of both project zones, an evaluation will be made on the current state of the local water resources and their predicted states due to sea level rise, development and resulting salinization. The two zones will be analysed to find the most water efficient methods for irrigation. For instance, a less water intensive spray technology will be evaluated to conserve irrigation water by TWW in the Northwest of the Gulf of Tunis. The methods will be evaluated by continual monitoring of the salt levels in the coastal aquifer systems and will be adjusted based on measurements and projections of aquifer yield and demand.

146. On the basis that the agricultural sector is the most water-intensive sector in Tunisia (consuming over 80% of freshwater supplies), this evaluation and the best irrigation practice guideline to be developed have the potential to provide significant water savings for both regions. In addition, development of best practices will adhere to the Ministry of Agriculture's programme and aim to promote substantial water savings measures to hinder and mitigate potential impacts from the salinization of agricultural land.

147. Current water recycling and desalination practices used by hotels in Djerba will also be documented and made public knowledge, including the costs and benefits. During project development, Stakeholder consultations with hotel owners indicated that several hotels in the project zone have installed desalination units for the purposes of supplying additional potable water to patrons. A public awareness campaign on successfully applied desalination and water recycling practices will motivate other hotels to take action. Also, an evaluation on the potential for irrigation by non-conventional water (e.g., treated wastewater and/or desalinated seawater) in green spaces of the tourist areas in Djerba will be conducted.

Coastal risk monitoring and early warning system

148. Building on and complementing the GIZ project, the project will also help APAL and other relevant technical institutions to conduct more coastal risk monitoring. The forecasting database will be strengthened by acquiring 3 tide gauges and 1 buoy. The multi-risk Early Warning System will be further improved by facilitating communication and data exchange between the information production technical institutes including INM, INSTM. Data will be fed into the Information System for Decision Aid (SIAD, Component 1). A communication protocol will also be developed so that the information producers can communicate with the information dissemination groups including the lighthouse and beacon services and the Navy National Guard. The protocol will define how to get the alert information to the local coastal communities in a timely manner.

149. To further support alert dissemination to communities, SCCF funds will be used to promote a collaboration between APAL and INM (the National Weather Service) to develop storm forecasting bulletins for the coastal communities. An urgent intervention plan will also be developed to be able to guide the appropriate local authorities and community members with how to prevent and mitigate impacts from flooding.

150. To support coastal adaptation implementation and risk monitoring, SCCF funds will build on on-going or planned baseline projects (discussed in Section A.4) in the following manner:

- Build on KFW's ***Coastal Protection Programme*** Phases I and II to learn which landscaping plants are best to combat marine erosion.
- Build on the ***Development work in the coastal zone of the Monastir Bay (1st Phase)*** in terms of best practices for beach nourishment.
- Take lessons learned from the ***Coastal Protection from Catharge to Gammarth*** project in terms of how to protect coastal forests and agricultural terraces.
- Build on the ***MedPartnership***'s experience in reinforcing methodologies to mainstream climate considerations into ICZM planning. The SCCF financed project will incorporate lessons learned on appropriate ICZM interventions as demonstrated in MedPartnership's pilot site.
- Work with the ***Water Climate and Development Program for Africa*** (WACDEP, 2014-2016, 9.2 m USD) to develop capacities to build resilience to climate change through better water management.

151. The SCCF financed project will also build on relevant projects in the following manner:

- Build on the support for ocean monitoring, equipment calibration and maintenance and 2D/3D modelling of ocean currents provided by the ***Environment Energy Programme*** of the Union European
- Build on the ***IASON*** (20,000 Euro, 2013-2015) project funded by the European Commission / Seventh Framework Programme: The SCCF financed project will work with IASON to improve climate change related coastal monitoring and to exploit research and innovation on climate resilient water and soil management.
- Collaborate with the ***Tunisian-Bavarian Cooperation*** and their monitoring studies of lagoon ecosystems to inform Integrated Coastal Zone Management.
- Build on the ***Arab Climate Resilience Initiative (ACRI)*** trainings at the regional level on the use of the toolkits in order to strengthen capacities in integrating climate change into gender-sensitive development plans and poverty reduction plans at a national level. SCCF financed project results will feed the lessons learned and best practices to be documented under ACRI so that requirements for adaptation can be integrated into the regional trainings planned on successful resilience projects for countries of the Arab region. Furthermore, the SCCF financed project will work with ACRI to establish monitoring schemes for SLR.

Output 2.1 Shore protection practices and technologies to mitigate long-term risks from SLR introduced in the region northwest of the Gulf of Tunis and on Djerba island

Indicative activities include:

2.1.1 Coastal protection practices for the northeast coast of Djerba

- Study on erosion and flooding risks for different scenarios and time horizons and evaluation of consequences and likelihoods of these risks along the northeast coast of Djerba
- Site specific feasibility study to inform activity design criteria and act as a baseline for a timed, prioritised adaptation plan for the beaches of Sidi Yati 1 & 2 and the Rass Errmal spit
- Protection and rehabilitation of the lower beach along the coast by establishing partnerships with private hotel operators to use of posidonia along the length of the NE coast of Djerba to reinforce back beach area along coast, increase back beach stability using seagrass, low grade nourishment and complementary planting and promote flow management

2.1.2 Specific coastal protection measures for Sidi Yati 1 (400 m)

- Stabilisation of the lower beach face by artificial perching, slope adjustment and sediment addition in accordance with the feasibility study of Activity 2.1.1
- Rehabilitation of the back beach area and building of a low artificial dune ridge parallel to the adjacent pathway
- Ongoing management of the dune buffer and monitoring and evaluation of the effectiveness of implemented measures through monthly beach profile surveys

2.1.3 Specific coastal protection measures for Sidi Yati 2 (2,000 m)

- Reinforcement of back beach area with sand fencing and rehabilitation of transverse dune system using locally available posidonia, sand augmentation and planting
- Use of intermittent sand fences (hessian and potentially date palm) spaced to allow through flow of sediment and encourage wind deposition to support dune building
- Ongoing management of the public beach to allow rehabilitation of the dune area and assist in resilience building - signage, pathway through from the adjacent road to the & placement of rubbish bins
- Regular beach width measurements and dune condition assessment to allow adaptive management of back beach area in particular

2.1.4 Specific coastal protection measures for the Ras Errmal spit at Djerba (8,000 m)

- Ganivelles north of Raddisson – with revised spacing, density and height to optimise sand capture (1km)
- Sand fences (hessian and date palm) – approximately 1 km
- Dune rehabilitation and conservation – planting, seagrass building and sand burial prior to storm season - approx. 2km
- Hydraulic wooden piles at the back beach to maintain barrier integrity while encouraging through flow of sediment towards terminal end of spit to retain current function
- Implement activity to improve management of the Ras Errmal spit in accordance with the feasibility study of Activity 2.1.1

2.1.5 Coastal protection measures for Sidi Ali El Mekki , Ghar El Melh and Kalat El Andalous in the NW coastal zone of the Gulf of Tunis (25,000 m)

- Risk assessment to establish the erosion and inundation hazard at multiple scenarios and timeframes and determine the consequence and likelihood of this hazard - particular focus on hydrodynamics of inner lagoon and recommendations for overall timed, prioritised adaptation plan for the Ghar El Mehl and Sidi Ali El Mehki coastal zone
- Site specific feasibility study to inform activity design criteria and act as a baseline for a timed, prioritised adaptation plan for the beaches of Sidi Ali El Mekki , Ghar El Melh and Kalat El Andalous
- Redevelopment access along the lido Sidi Ali El Mekki in view of enhancing its stability (according to feasibility study)
- Redevelopment of backshore depressions Sidi Ali El Mekki (in feasibility study)
- Use ganivelles(approx. 2km), sand fences, brushing (intermitted) to encourage sediment build up at back beach to build steepness of barrier
- Widen the culverts along the causeway to the south to improve flushing of the inner lagoon
- Ongoing management of the public beach to allow rehabilitation of the dune area and assist in resilience building - signage, pathway through from the adjacent road to the & placement of rubbish bins

- Apply living shoreline techniques from the old harbour to the Sidi Ali El Mekki to the rehabilitate the degraded marshland adjacent to the coastal road – 2 km

Output 2.2 Improved water management and savings practices for coastal fresh aquifer resources implemented in both project zones to prevent saltwater intrusion resulting from SLR

A range of studies and actions will be used to develop an integrated coastal aquifer management strategy for both project regions including:

2.2.1 Improving knowledge and practices on the management of water resources in Djerba and in the NW Gulf of Tunis with developmental studies on:

- Evaluating the state of local water resources of the two project zones in terms of the impact of SLR on the water quality with particular emphasis on analyzing agricultural irrigation, in particular spray irrigation, and including the preparation of guidelines for best irrigation practices in the project zones
- Documenting and enhancing water recycling and desalination practices by hotels in Djerba
- Evaluation the potential for irrigation by non- conventional water (e.g., treated wastewater and desalinated seawater) in green spaces of the tourist area of Djerba in order to reduce the effect of increasing salinity in groundwater caused by SLR

2.2.2 Implementation of demonstrative actions

- Implementation of water recycling, small-scale desalination and/or TWW applications as defined in Activity 2.2.1
- Application of more efficient water-savings irrigation practices in both project zones, including with TWW to support for the fight against saltwater intrusion induced by SLR
- Monitoring of the salt content in aquifers as well as the aquifer yield to provide data on intrusion and to determine best aquifer management practices including the potential for introduction of controlled recharge.

Output 2.3 Technical capacities, institutional functions and associated budgets in place at the APAL and municipalities including NGOs/CSOs for the maintenance, monitoring and expansion of the introduced shore protection and coastal adaptation practices

2.3.1 Implementation of regular, technical capacity reinforcement, prioritized according to the needs of the technical personnel. The topics to be addressed include (non- exhaustive list): marine logistics, technical and network maintenance for oceanographic measurement equipment, quality assurance of oceanographic data, processing of oceanographic data and 2D/3D modelling of the marine environment

2.3.2 Practical knowledge exchange and transfer of technological skills on innovative soft coastal protection methodologies and good management practices

2.3.3 Strengthening the technical capacity of the APAL with targeted one-time technical assistance through the mobilization of external expertise (national and international) in the following (non-exhaustive list):

- Physical Oceanography for the statistical processing of oceanographic and hydro- biological data time series Database management of oceanographic data

- Finance: Budgeting and planning sustainable operation and maintenance of monitoring equipment
- Maintenance of equipment and instruments (buoys and tide gauges)

2.3.4 Strengthening the capacity of the staff of the three municipalities of 1) Jerba, 2) Kalat el and 3) Ghar El Melh as well as local NGOs in the design, installation and tracking of resilience building projects

2.3.5 Creation of a network of NGOs in Jerba and the northwest area of the Gulf of Tunis in order to empower them with capacity building so that they can design and build coastal resilience projects

2.3.6 Monitoring, servicing and maintenance of network devices for oceanographic monitoring (buoys and tide gauges) including the design and implementation of an annual maintenance program

2.3.7 Environmental Impact Assessment according to Tunisia law (Law 115 of 30/11/1992 and Law 2001-14 of 30/01/2001 and Decree No:91-362)

Output 2.4 Coastal risk monitoring and early warning mechanisms focusing on SLR-induced erosion, urban flooding designed and introduced

2.4.1 Improving knowledge and best practices for monitoring and management of coastal hazards

- Development of a refined and specific vulnerability map for the project area, linked to the extreme projected conditions of SLR
- Strengthening the forecasting database on extreme conditions by acquiring three (3) tide gauge and one (1) buoy

2.4.2 Establishment of an information and communication system between APAL and national and international institutions including INM, INSTM , SHO, lighthouses and beacons services, Research Centers, the Navy National Guard, OMMP, APIP

- Development of a standard communication protocol from the National Guard to the level of coastal communities to communicate oceanographic forecasts
- Pooling of data available at the relevant institutions (e.g., Hydrological Service, SLR Monitoring, INM, weather forecasting, and INSTM, etc) to feed the Information System for Decision Aid (SIAD) decision support system (Activity 1.3.1)
- Collaboration with INM to develop bulletins for storm forecasting with sufficient lead time that include recommendations for mitigation measures

2.4.3 Design of an urgent intervention plan to prevent and mitigate impacts from urban flooding and flooding induced by SLR, including a pilot test

Component 3: Economic incentives for coastal adaptation

Outcome 3: Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures ($590,000)

2.4.5 Baseline Component 3 - Without SCCF Intervention

152. Specific to coastal adaptation, the 2008 SNC coastal study has estimated the total capital cost of adapting to a 0.5 meter SLR scenario in Tunisia is approximately 1 billion USD. Although still tentative and probably underestimated (as it does not fully consider the costs of private adaptation), this figure gives some indication of the financial burden that climate change poses on the country economy and

national budget. Financial resources in Tunisia, both nationally and internationally, are unlikely to be sufficient to cover the entire expected impacts. Nonetheless, as stated in the National CC Adaptation Strategy of the Tourism Sector (2010), additional funding sources are required, on both national and local levels, to sustainably support and upscale adaptation efforts in the long term.

Financing for community based coastal adaptation

153. In Tunisia, adaptation efforts are generally undertaken at the national level with the involvement of APAL and more recently, due to the revolution of January 2011, at the local level. (The democratic revolution of January 2011 empowered the development and force of NGOs/CSOs in Tunisia). This was evidenced in the Africa Adaptation Project when a call to environmentally-focused NGOs to build CC awareness was put out to tender. Twenty (20) NGOs expressed interest and 7 were retained to assist with climate change and climate change adaptation awareness raising. In Djerba, the ASSIDJE NGO conducted CC awareness-raising for the coast of Djerba during 2012 through the AAP project. They received 6,500 USD to assist with this task. However, in spite of this one-time support by AAP for NGOs, NGOs/CSOs throughout Tunisia are lacking financial resources to conduct environmentally-related actions.

154. This is in contrast to the private hotel industry in Djerba. Hotels are currently financing their own ad-hoc coastal protection measures. For example, various hotels have built seawalls in Djerba to combat erosion. However, although the construction of sea walls has been an attempt to stabilize the beach, these hard structures are actually exacerbating the loss of sand. As indicated during the first workshop during the project preparation phase, the hotel industry in Djerba is fully aware of the impacts of erosion. However, the tourism industry has no knowledge on what actions can be used to sustainably mitigate the impacts of erosion and Sea Level Rise (SLR). Consequently, hotels are unwittingly implementing examples of mal-adaptation. For instance, beachfront hotels are removing natural posidonia seagrasses because of their odor and unaesthetic appeal. However, it has been well established in Djerba that the posidonia when compacted in layers with the sand acts as an effective natural stabilization technique.[34] A case in point is one private residence along the Djerba coast whose owner has been collecting native posidonia seagrasses and layering them with sand over the past 12 years. This residence shows the only beach front property which has successfully resisted erosion.

155. Successful demonstrations of soft adaptation techniques in Tunisia need to be shared with the municipality, the NGOs/CSOs and the private sector (most notably hotels in Djerba) so that best practices can be scaled up. However, in order to finance up-scaling, funding mechanisms have to be created to support the implementation of soft adaptation techniques. On a small scale, NGOs/CSOs do not have access to funds to perform small-scale adaptation measures such as sand-posidonia layering or fabrication and installation of palisade (ganivelle) fencing. In contrast, private hotels have some funds but have limited awareness, knowledge and motivation to use soft, integrated approaches.

Financing on the national level for coastal adaptation

156. Currently, significant funds are required to support adaptation in Tunisia. According to an IDRC study[35], relative to other North African states, Tunisia has the highest number of requested adaptation activities. However, of the 808 m USD funding required, they have raised only 28 m USD as of October 2013. In order to address the lack of funding, the IDRC assessed Tunisia against 2 criteria:

1. National framework conditions and readiness to access and absorb adaptation finance; and
2. Overall availability of data and expertise and knowledge/information sharing.

[34] One volume of Posidonia can retain three volumes of sand according to ANPE.

[35] Tippman, R., A. Agoumi, L. Perroy, M. Doria, S. Henders and R. Goldmann, ***Assessing Barriers and Solutions to Financing Adaptation Projects in Africa***, IDRC report, October 2013

157. It was concluded that Tunisia is well-positioned to attract and receive adaptation finance. However, mechanisms and institutional capacity building to facilitate the mobilization of funds are required.

158. The challenge is that Tunisia has limited expertise and practical experience in making use of existing financing instruments and in finding innovative ways to attract and direct appropriate levels of resources towards long-lasting and planned adaptation interventions. For coastal planning, this includes finding financial incentives for strategic retreat from the coastline and limiting development in low-lying coastal floodplains and high-hazard areas. Also, while a significant portion of coastal adaptation investments is likely to generate private goods and benefits (such as restoring beaches for specific tourism resorts), the corresponding costs and financing efforts are still inequitably shared between the public and private sector. So far, there have been no mechanisms to increase economic returns and financial contribution from the private players that will benefit the most from coastal adaptation.

159. Numerous small funds and taxes exist in Tunisia. These include among others, the National Fund for Habitat Improvement (2005), the Fund for the Protection and Aesthetics of the Environment (2005) and the Tax for the Protection on the Environment. However, each is associated with a particular institution and none are managed by financially-savvy personnel which have the capability of expanding and diversifying portfolios to have sufficient capitalization.

160. The existing National Fund for the Protection of Tourism Zones (NFPTZ) could provide a mechanism to increase returns. However, in its current form, the fund lacks the necessary regulations and resource base to adequately mobilize funding in support of critical adaptation investments. Indeed, the main mandate of the NFPTZ is to maintain the aesthetic value and attractiveness of tourism areas and not to fix environmental and climate-related problems such as beach erosion. For example, between 2002 and 2010, the NFPTZ spent a considerable budget for the installation of tourism facilities and equipment (beach umbrellas, outdoor chairs and tables, showers, toilets, etc.) in more than 100 beaches across 13 governorates. However, no significant investment was made to protect/rehabilitate the beaches and other tourism-supportive coastal systems from environmental degradation or SLR effects. Even though the NFPTZ would have the appropriate mandate and structure, its current level of resources would not suffice to engage meaningfully into adaptation works such as beach nourishment which costs around US$1 million per km.

161. While some financial reforms do happen in the tourism sector that could potentially offer valuable funding sources and mechanisms for adaptation, this sector remains insensitive of long-term environmental issues and associated financing needs. A prime example is stated in the new National Tourism Strategy 2016. The plan is to create an airport tax to increase the tourism budget while decreasing an existing Tax for Sustainable Development, from 1% to 0.5% in order to focus on other more revenue-generating taxes. The Tourism strategy demonstrates its ability to generate revenue. At the same time, it shows how its aim is to not protect the environment or build resilience to climate change unless revenues are feasible. This is somewhat paradoxical given the critical importance of well-preserved shorelines for the tourism economy and for its resilience to sea level rise.

162. Tunisia is therefore lacking the capacity and incentive to explore both the international climate change financial landscape as well as to exploit domestic financial resources from taxes and existing funds to earmark financing for coastal adaptation. As indicated by Stakeholder consultations with the Tourism boards (AFT and ONTT) part of this issue is that the most revenue-generating sectors such as Tourism must focus on the short-term (e.g., next 5 years maximum). As such, they do not consider mobilizing financing to address the potential gravity of climate change impacts in the long-term. As indicated by the Economic Report, Tunisia's widening trade deficit, combined with weak inflows of tourism receipts has put external balances under renewed pressure. In fact, the private sector's focus on

the short-term has been exacerbated by weak inflows of tourism receipts in 2013 and a widening trade deficit.[36]

163. Furthermore, the sustainability of national funds is dependent on having governance mechanisms in place to ensure appropriate financial management, transparency and accountability. As indicated in the National Tunisian report for the UNFCCC in October 2011[37], Tunisia is victim to the risk of corruption where funds are often inappropriately channelled to serve short-sighted needs. The long-term vision of adaptation without oversight presents a twofold risk of diverted funds and sub-standard work which may put populations at even more risk of climate extremes.[38] The need for increased technical specialization and ambiguous definitions of adaptation activities (as opposed to traditional development) make the benefits of adaptation more difficult to monitor, resulting in the potential for massive diversion of funds. From needs assessments, through the preparation and bid design phases, to contract implementation, corruption is a risk. Therefore, Tunisia requires an overarching monitoring and evaluation mechanism and/or body to ensure that funds are being used appropriately.

Introduction of risk reduction and transfer mechanisms

164. Additionally, Tunisia requires an awareness and understanding of the benefits of using fiscal and market-based instruments not only to accumulate financial capital but also to incentivize risk reduction. At present, there are no incentives for encouraging private firms and households to engage into risk-abating measures and redirect private investments from the coast towards inland or less risky coastal areas. Moreover, the tourism industry is not charged with responsibilities to have coastal protection (against erosion) and risk reduction plans (e.g. flood risk management plans) or to climate proof their infrastructure in a way that reinforces robustness of the coast and does not block coastal sedimentation processes or erode natural coastal buffers, such as sand dunes.

165. Poor land management and weak enforcement of building codes has led to unsustainable development in sites at risk to sea level rise, erosion and coastal inundation. Significant losses from property damage have followed natural disasters (e.g., September 2003 flood).[39] Presently, the government is expected to provide support for public and private reconstruction along the coast within the Maritime Public Domain because property owners, namely hotels in Djerba, are not required and aware of property catastrophe insurance or disaster risk insurance which can be used to cover the costs of coastal impacts such as flooding.

166. The underlying issue is that with increasing SLR and erosion, Tunisia cannot keep pace with its rapidly growing asset bases at risk. It does not have dedicated resources for reducing exposure. Insurance offers an opportunity to transfer extreme weather and climate change risks to private investors or the international market (reinsurance). However, not one hotel in Djerba has or is aware of disaster risk insurance[40]. They are also unfamiliar with cases where introduction of insurance and risk reduction products has been successful in similar developing countries[41].

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[36] Economic Intelligence Unit, Tunisia Country Report, July 2013.

[37] Préparation à la Conférence des Nations Unies sur le Développement Durable (Rio + 20), National Tunisian Report, October 2011.

[38]Transparency International, *Global Corruption Report*. 2011
http://www.transparency.org/whatwedo/publications/doc/gcr/

[39] Torrential rains that occurred in September 2003 devastated the greater Tunis area. These probable torrential rains with a 100-year return period resulted in the death of four people and damage valued at around 432 m USD.

[40] Disaster risk insurance encompasses property catastrophe risk (micro-)insurance (e.g., for private dwellings) where losses are caused by widespread adverse natural events

[41] The World Bank's Disaster Risk Financing and Insurance Programme,

[41]http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTFINANCIALSECTOR/EXTDISASTER/0,,contentMDK:23305437~menuPK:8921438~pagePK:64168445~piPK:64168309~theSitePK:8308421,00.html

2.4.6 Adaptation Alternative Component 3–With SCCF Intervention

Investment mechanisms for community based coastal adaptation

167. As shown through successes of previous and on-going projects (Africa Adaptation Project, KFW) there is existing knowledge on effective soft adaptation techniques to build beach resilience. However, these techniques have not been duplicated due to lack of funds, and overarching policy framework and lack of awareness. NGOs in Tunisia are well placed to provide awareness raising. For instance, the ASSIJE NGO in Djerba provided awareness raising on Climate Change to the coastal area during the Africa Adaptation Project. As indicated during the Stakeholder consultations they are very active and eager to save the coastal and agro-ecological zones (agriculture being the dominant livelihood in the northwest coast of the Gulf of Tunis). It seems logical then to empower the NGOs and local communities to have access to funds earmarked for coastal adaptation projects.

168. In order to justify soft measure implementation, a Net Present Value (NPV) analysis of a planned community-based coastal adaptation measure versus implementation of a hard engineering coastal barrier was conducted (Annex 2b). In the NPV study, three cases were weighed, i) the base case of doing nothing, or the Business As Usual (BAU) case where erosion continues, ii) building the beach by using community manpower to layer posidonia sea grass with sand and iii) constructing a breakwater (riprap hard measure). Analysis indicates that during the first year, the initial cost of the soft measure is significantly lower than the potential loss of income hotels could potentially experience with beach erosion (i.e., the case of doing nothing or the BAU case). In contrast, if a breakwater is constructed, the cost of construction during the first year well exceeds the potential damage associated with the cost of doing nothing. Past the first year, the cash flows of the soft and hard cases were compared over a 10 year period. Note that the lifetime of the breakwater was assumed to be 10 years. Maintenance was considered to be minimal for the hard option while the maintenance and monitoring costs of the soft option were considered each year. Results demonstrate that the NPV was greater for the soft option over the 10 year period indicating that it is the better adaptation option from a financial perspective. A conclusion taken from the analysis is that community-based implementation of soft measures is a worthwhile investment.

169. To facilitate the mobilisation of funds for innovative soft coastal adaptation measures, the project will strengthen the ability of the Tunisian government to better use existing financial mechanisms for coastal adaptation and management. It will work closely with local tourism companies and investors, including banks and link up with Tunisia's Green Economy Initiative. Specifically, Component 3 will encourage private public partnerships so that the influential and prevalent private tourism sector can get involved in sustainable coastal management.

170. Specifically, SCCF funds will be used to provide joint grants to an NGO/community/hotel collaboration to improve coordination between the tourism and public sectors and promote shared management. By leveraging the private sector and creating an enabling environment for adaptation activities, the project will support NGOs to have appropriate tools to build fences (palisades, ganivelles) and implement soft coastal protection measures under the guidance of APAL. Money will be granted based upon selection criteria which will demonstrate the hotels/resorts are committed to apply robust and sustainable beach protection measures to support long-term adaptation strategies and that NGOs/CSOs/community members have a good track record with implementing and managing projects. SCCF funds will be used to provide additional training to local NGOs/CSOs or community groups in financial literacy and cash management. Another option to be evaluated during project implementation is to fund existing small grant programmes for CSOs on the local level to conduct coastal adaptation projects. Through the AAP project, CSOs have demonstrated that they are capable of providing environmental awareness. Stakeholder discussions during project development further indicated that CSOs are knowledgeable and motivated to implement small coastal adaptation projects.

171. SCCF resources will also be used to finance community nursery development (with an emphasis on nurseries managed by women) to provide a supply of local vegetation which will be used to support dune fixation and other soft coastal protection measures. The plants and planting services will be sold to private residences and hotels. If the nurseries prove to be lucrative, it is likely that an existing micro-finance scheme in Tunisia will be used to scale-up nursery operations. A possible application of scaling-up will be to provide plants to Living Shoreline applications throughout Tunisia (such as in the Mediterranean) which would require kilometres of dune fixation vegetation to be planted.

172. By providing joint grants, the tourism industry will be incentivized to apply the optimal cost-effective adaptation options to be provided by the guidance package to be created in Component 1. The use of locally-sourced, environmentally friendly materials to protect their beaches (e.g., posidonia-sand layering) will most likely be one of the recommended options. Such an option can be fully supported by the joint grants because the NGOs/CSOs or community groups can provide the local manpower to implement this simple sand-building measure. The joint grant concept thus fully supports Tunisia's goal to support ICZM because Stakeholders both public and private will be mandated to work together in order to receive the financing. At the same time, the joint grants will support local coastal management which when demonstrated in pilot sites, can easily be replicated in future applications, past project completion.

173. SCCF funds will also be used to create a partnership with the Green Economy Initiative (GEI)[42]. The GEI has an objective to promote "green employment" and "green industry" and has the long-term vision of finding sustainable financing to combat degradation. During project preparation, GEI expressed interest in becoming an investment partner in the local production of "palmivelles". Palmivelles would be a unique palisade (i.e., ganivelle) fencing made of the spine of native palm tree leaves which would be used to capture sand and rebuild sand dunes. The soft coastal adaptation technique has demonstrated success in a small pilot project by APAL. The fabrication and planting technique can be easily performed by community members, thereby supporting local green employment and community-based coastal adaptation. The motivation for producing palmivelle was instigated during the AAP project when APAL had to import ganivelle fencing material from France due to its unavailability in-country. APAL imported a type of chestnut tree wood to act as fencing which, although the material was effective, was considered too costly to perform on a larger scale.

174. Through Component 3, the proposed project plans to analyse the feasibility and market demand of locally produced palmivelles which would be fabricated from local Djerba palm trees. If the technique is proven to be succeed in a large pilot test and there is a market to purchase the product, GEI will support the development of a local industry and labour force. A market study must initially be conducted because there is no sense of the needs and profitability for palmivelles. A few hotels expressed interest in using ganivelle after the AAP pilot project; however, the locally-produced palmivelle must demonstrate its effectiveness on a large scale to a large audience. As indicated during Stakeholder consultations, the GEI's interest in analyzing the production of palmivelle is further supported because they would like to test the use leftover palm debris as biomass (which can serve as energy or fertilization).

175. The market study will include two parts; 1) pilot testing the palmivelle technique by APAL and 2) a financial feasibility study by the Green Economy Initiative (GEI). (For example, the GEI will analyze the prospective of starting a Trust Fund to financially support the palmivelle concept.) To support the market study, GEI will provide cash co-financing of approximately 30,000 USD to support the financial feasibility study. If the market study can demonstrate that palmivelle production is financially and technically feasible, it is expected that the palmivelle concept will provide a local green industry that be marketed as an eco-friendly approach for dune rehabilitation for coastal management and possibly desertification. A successful pilot test by APAL will ensure the technology can be up-scaled and possibly exported.

[42] The Green Economy Initiative is partly funded by ESCWA and partly by the Government of Tunisia

Investment mechanisms on the national level for adaptation

176. Financing mechanisms to support coastal adaptation on the national level will also be explored. Efforts will go towards increasing the capitalization of existing environmental funds through the diversification and broadening of their resource bases. a systematic review of the existing national and local financial resources that could be optimized and better mobilized for adaptation will be conducted. In this regard, technical assistance will be provided to increase the financial contribution of environmental funds.

177. Specifically, capacity to mobilise funds will be built within the National ICZM platform (Component 1) so that it can identify a mix of financing sources and appropriate fund channelling mechanisms for coastal adaptation by exploring both the international climate change financial landscape (e.g., Adaption Fund) as well as domestic financial resources from taxes and existing funds. The SCCF financed project will collaborate with the Global Water Partnership and the MedPartnership which plan to also try to identify international financing.

178. The numerous national environmental funds including the National Fund for the Protection of Tourism Zones (NFPTZ) will also be analysed through Component 3. Based on this analysis, an Environmental Fund Management System will be developed by the National ICZM Platform. The role of the Environmental Fund Management System will be to create a synergy among existing environmentally-related funds so as to enhance their collective power to mobilize funds. In each respective environmental ministry there is a lack of financing expertise which has meant that the funds are not well capitalized and are poorly managed. An overall financial expert will be engaged to facilitate fund mobilization across sectors as part of the Environmental Fund Management System. The expert will provide a roadmap on financing strategies.

179. The project will support the Ministry of Equipment, Land planning and Sustainable Development and the Ministries of Finance and Tourism to analyse the feasibility of a ''climate change contribution'' into the new fiscal system proposed under the draft tourism tax bill. The idea is for SCCF funds to support APAL to work motivated hotel and resort owners (such as those already participating in Blue Flag label[43]) to employ voluntary visitor fees in certain locations (airport, natural parks, tourism beaches, etc.). The fees will be used to support community-partner adaptation projects. APAL will work with hotel/resort management to devise a portfolio of adaptation measures which can be financed by the voluntary fees. The measures would be applied with the partnership of local NGOs/CSOs and community groups to inspire a sense of shared management and to save money with the use of local manpower. These voluntary fees will be used to finance beach rehabilitation, fencing, dune protection etc. which will provide benefits to the resorts, tourism business and also be used as a market instrument for the "climate smart / responsible" resorts, adding on to the environmentally-friendly, Blue Flag label concept in Tunisia.

180. Furthermore, the feasibility of charging a certain percentage of each tourism sector investment programme (determined by scale, location and type of investment) to finance environmentally and socially sound adaptation measures will be evaluated. This will entail examining appropriate ways for enhancing and adjusting the structure, collection and allocation of the existing fees already leveraged by the Ministry of Finance from the concessions awarded within the Maritime Public Domain. The project will assist with the revision of the main policy priorities, eligibility criteria and regulations governing existing environmental funds to allow for a significant portion of its resources to be directly allocated to the financing of priority adaptive measures (such as beach nourishment, dune protection etc.) in vulnerable areas. Potential gaps in geographical coverage, disbursement procedures and management

[43] http://www.blueflag.org/ The Blue Flag label in Tunisia presently used by hotels in Tunisia is a marketing mechanism used by hotels to demonstrate they are environmentally-friendly

rules that may affect the efficiency of environmental funds for coastal adaptation will be reviewed and revised.

181. To ensure sustainability with all the Environmental Funds, SCCF funds will be used to develop required governing mechanisms and conditions of access for all adaptation financing schemes. A Monitoring and Evaluation scheme to document lessons learned on how to implement no/low regrets investments will also be developed. Strengthened governance mechanisms which reduce existing corruption risks will make climate change policy more effective and successful.

Introduction of risk reduction and transfer mechanisms

182. The project will also help the GoT to explore and set up innovative fiscal regimes and mandatory insurance schemes targeting private properties as a means both to catalyse additional finance for adaptation. The application of such schemes will provide incentives for gradual relocation of key socio-economic assets away from the coast. It will also incentivize risk adverse behaviours across vulnerable businesses and households. To implement the schemes, the project will work closely with the Ministries of Finance and Interior to build innovative public-private partnerships such as with the insurance/reinsurance industry. (It should be noted that the application of taxes was not considered a feasible option in the current political climate and as indicated by Stakeholder consultations.)

183. To discourage building activity in risky areas, encourage adoption of climate-proof construction standards, and ultimately, reduce moral hazard across developers and owners, as recommended by the 2010 National Climate Change Adaptation Strategy for the Tourism sector, a system of Transferrable Development Credits (TDC) will also be introduced to the municipalities in the 2 project zones. The idea is to create market incentives without the application of taxes to shift development to areas where development is preferred.[44] Through zoning ordinances, local governments designate areas where they want to discourage development ("sending areas"). The ordinance allows property owners in these areas to sell development credits to areas where the local governments want to encourage development ("receiving areas"). The buyer can then use the credit to exceed development densities, floor areas, or building heights in receiving areas. The property owner of the restricted parcel receives financial compensation for forgoing development and preserving his or her property. Such a system has been well-established in the United States in coastal areas prone to SLR like Florida. As shown in such areas, a TDC program can be used to address sea-level rise by establishing and calibrating a development credit market in a manner that gives landowners affected by SLR an incentive to transfer their development rights rather than build on threatened properties.

184. Another innovative financial avenue to be explored includes the introduction of property insurance which will be used to incentivize development in low risk areas (i.e., Development in areas not at high risk to storm surges, erosion, etc. will have lowerer premiums). Insurance can provide effective risk sharing and risk reduction incentives in coastal built environments if it is designed and introduced appropriately. In order to transfer risk to the private sector such as the tourism industry in Djerba, a market study will be conducted to determine feasibility; SCCF funds will support analyses on the adequacy of monitoring equipment, the required insurance production systems (e.g., underwriting, product design and pricing, claims settlement), necessary delivery channels, and required regulatory frameworks. Making property insurance compulsory (e.g. linked to credit) and/or integrating it within social protection programs will also be analyzed in order to ensure that the critical market size for profitability can be achieved. Similarly, the value and feasibility of micro-insurance systems will be tested to ensure that the most vulnerable and poor households can also benefit from property insurance.

185. In order to ensure sufficient distribution of property insurance, SCCF funds will be used provide awareness to the Tourism Boards and property owners on options currently available to distribute risk such as the use of re-insurance to transfer risk to the international market and how complementary

[44] Grannis, J. Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use, October 2011.

insurance/credit packages can increase the uptake of both financial services. Capacity reinforcement on risk management options will be provided to at least 100 Tourism board members, hotel proprietors and owners of beachfront residences with the support of SCCF funds. Based on the fact that no hotel owners or residences have property insurance, it can be conservatively expected that at least 200 households (including hotels and resorts) will adopt property insurance as a risk sharing mechanism by the end of the project.

186. To support adaptation fund mobilization and the introduction of insurance, SCCF funds will build on baseline projects (discussed in Section A.4) in the following manner:

- Collaborate with the ***Green Economy Initiative*** (GEI) - The SCCF financed project and the GEI will develop a partnership to support "Green Employment" and Green Industry. Together both the SCCF financed project and GEI will finance a joint market study to determine the technical and financial feasibility of producing locally produced ganivelles or "palmivelles" from local palm trees. See Co-financing letter attached.
- Build on the ***Water Climate and Development Program for Africa*** project (WACDEP, 2014-2016, 9.2 m USD) which aims to develop 'no regret' financing and investment strategies for climate change adaptation.
- Collaborate with the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** (2013-2014) project by using the training materials on the economics of adaptation as it relates to medium- and to long-term national and sub-national planning as well as in evaluating and apprising different adaptation investment projects. The SCCF financed project will also exploit knowledge on emerging sources of climate finance under the UNFCCC mechanisms as well as outside sources from development banks, the private sector, etc. Based on Stakeholder consultations between UNDP and the Global Water Partnership, it is planned that the SCCF financed project and the Economics of Adaptation Project (for which the GWP is a member) will work together to develop a balanced portfolio of investment options for climate resilient development where SCCF financed project will focus on coastal adaptation.
- Complement the ***MedPartnership***'s objective to leverage long-term financing by building capacity within the National ICZM platform to find funding mechanisms for coastal adaptation by exploring both the international climate change financial landscape and existing National Funds. Also, the development of the Environmental Fund Management System to be developed in the project will be used to create a synergy among existing environmentally-related funds so as to enhance their collective power to mobilize funds.

187. The SCCF financed project will also build on relevant projects in the following manner:

- Build on the ***Arab Climate Resilience Initiative's (ACRI's)*** experience in engaging with the private sector as a planning and implementation partner in adaptation and mitigation interventions for SLR and coastal erosion activities.

Output 3.1 Investment mechanisms for community based coastal adaptation developed and initiated in both project regions with participation of key tourism operators (Djerba) and farmers (Northwest of Gulf of Tunis)

3.1.1 Establishment of joint grants to support communities, NGOs/CSOs to assist with small coastal adaptation project implementation with a particular emphasis on shared management activities where hotels work in cooperation with local NGOs/CSOs (e.g., building fences and planting grasses) (Note: Analysis shows that the NPV of community-based soft coastal adaptation measures is greater than that of hard engineering options, see Annex 2b).

3.1.2 Development of community-run nurseries to cultivate local vegetative species for the private sector to support dune fixation (Note: if lucrative, nursery continual operating costs can be supported by an existing microfinance scheme in Tunisia)

3.1.3 Knowledge sharing with international tourism operators on cost-effective best practices for coastal adaptation and coastal erosion risk management

3.1.4 Financial management and literacy training for NGOs and community members who partake in coastal adaptation project implementation

3.1.5 Partnership with the Green Economy Initiative to do a market study on "green employment" promoting the production of locally-sourced palm leaf ganivelle production, a soft coastal protection measure. APAL will be responsible for the technical feasibility study and the GEI will conduct the financial feasibility study)

Output 3.2 Innovative financing instruments introduced and existing funding mechanisms enhanced from national sources to support coastal adaptation

3.2.1 Study by the National ICZM Platform (see Activity 1.1.6) to identify a mix of financing sources and appropriate fund channeling mechanisms for coastal adaptation by exploring both the international climate change financial landscape as well as domestic financial resources from taxes and existing funds including the National Fund for the Protection of Tourist Zones

3.2.2 Development of an Environmental Fund Management System by the National ICZM Platform to create a synergy among existing environmentally-related funds so as to enhance their collective power to mobilize funds

3.2.3 Development of required governing mechanisms and conditions of access for all coastal adaptation financing schemes

Output 3.3 Insurance and property development credits that provide effective risk sharing and risk reduction incentives in coastal built environments designed and introduced amongst 500 highly exposed businesses and households

3.3.1 Capacity reinforcement through 2 weekly training sessions for at least 100 Tourism board members, hotel proprietors and owners of beachfront residences on property insurance as a means to spread coastal risks

3.3.2 Creation of a Transferrable Development Credit incentive programme to promote building development outside coastal areas vulnerable to rising sea levels and erosion by having the local governments impose zoning ordinances designating areas where development is discouraged ("sending areas ") and encouraged ("receiving areas ")[45] including training for the 2 project municipalities on setting zoning ordinances

3.3.3 Feasibility study on introducing property insurance (which accounts for natural risks), including the use of re-insurance to transfer risk to the international market and how complementary insurance/micro-insurance credit packages can increase the uptake of both financial services. The SCCF financed project could collaborate with the World Bank's Disaster Risk Financing and Insurance Programme[46] to integrate lessons learned and to exploit any insurance products which can be made available to Tunisia.

[45] Grannis, J., Georgetown Climate Center, *Adaptation Toolkit, Sea Level Risk and Coastal Land Use* October 2011.

[46] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTFINANCIALSECTOR/EXTDISASTER/0,,contentMDK:23305437~menuPK:8921438~pagePK:64168445~piPK:64168309~theSitePK:8308421,00.html

A summary of the Outcomes, Outputs and the financial resources per Output is provided in Table 5 below.

Table **5**: Summary of Outcomes and Outputs

OUTCOMES	**OUTPUTS**	**COST (USD)**
Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved	1.1 Regulations and enforcement mechanisms governing coastal land use and EIA strengthened to include climate risks management requirements, with a particular focus on siting and construction of infrastructure and tourist facilities	131,250
	1.2 Advanced coastal risk assessment and adaptation economics tools for planning introduced at 4 planning authorities (APAL national and 2 regional branches, Bureau of Tourism and the regional governments) delivered to 200 key technical staff and decision makers for them to understand and respond to the impacts of climate change induced risks/disasters on coastal infrastructure, economies and livelihoods	221,850
	1.3 Hardware and software delivered to improve observation capacities, data collection and treatment (topographic and bathymetric surveys, MIKE11 flood and coastal surge modelling software and SEDSIM, Fortran for sediment process modelling)	140,650
	1.4 In at least 2 vulnerable coastal regions and municipalities (Northern coast of Tunisia and Djerba), spatial plans (Agenda 21, PAU) developed based on impact scenarios, shoreline management planning and cost-benefit analysis of adaptation options	166,250
2. Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 40 km of coast and benefiting 150,000 inhabitants	2.1 Shore protection practices and technologies to mitigate long-term risks from SLR introduced in the region northwest of the Gulf of Tunis and on Djerba island	2,324,100
	2.2 Improved water management and savings practices for coastal fresh aquifer resources implemented in both project zones to prevent saltwater intrusion resulting from SLR	325,020
	2.3 Technical capacities, institutional functions and associated budgets in place at the APAL and municipalities including NGOs/CSOs for the maintenance, monitoring and expansion of the introduced shore protection and coastal adaptation practices	1,101,040
	2.4 Coastal risk monitoring and early warning mechanisms focusing on SLR-induced erosion, urban flooding designed and introduced	249,840

3. Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures	3.1 Investment mechanisms for community based coastal adaptation developed and initiated in both project regions with participation of key tourism operators (Djerba) and farmers (Northwest of Gulf of Tunis)	248,700
	3.2 Innovative financing instruments introduced and existing funding mechanisms enhanced from national and international sources to support coastal adaptation	155,700
	3.3 Insurance and property development credits that provide effective risk sharing and risk reduction incentives in coastal built environments designed and introduced amongst 500 highly exposed businesses and households	185,600

2.5 Key indicators, risks and assumptions

188. Key indicators, risks and assumptions are indicated in the Project Results Framework and Risk Log in Annex 1. Indicators have been developed to be Specific, Measurable, Achievable, Realistic and Timebound ('SMART') and are indicated in the Project Results Framework. Risks and recommended countermeasures were identified during bilateral consultations during the project preparation phase.

189. Key risks and assumptions underlying project development include the following:

Table 6: Key risks and assumptions

Risk	Level	Mitigation Measure
Insufficient institutional engagement and coordination may prevent successful project delivery especially in the current transitional context, in Tunisia	Medium	A strong commitment from the GoT and the political leadership of the Ministry of Equipment, Land planning and Sustainable Development will minimize such a risk. Additionally, the project will be prepared and carried out under the oversight of the National Commission for Natural Resources, which brings together the main government institutions concerned with this project. The Commission, placed under the authority of the Prime Minister, will play a key facilitation and coordination role between sectors with the assistance of the climate change focal point. Also, the project has been designed to account for the lessons learned from UNDP AAP project including best strategies and arrangements to ensure active inter-ministerial engagement throughout implementation.

Resistance among key socio-economic stakeholders (i.e. tourism operators, property owners, etc.) to participating in new economic instruments for adaptation	Medium to high	To minimize this risk, the project will hook up with Tunisia's 'Green Economy' initiative that was launched in 2013 with a Strategy for 2016-2036 and which aims *inter alia*, to support economic policy reforms and new incentive mechanisms for increasing public and private investment into the environmental sector. The project will add a coastal adaptation layer to this process and will use it as a strategic vehicle and multi-stakeholder platform to foster an active policy dialogue on the desired economic instruments. It will proceed through concerted negotiations involving the government institutions, representatives of key socio-economic groups and other key partners and will seek to reach a broad-based consensus on economically and socially acceptable fiscal and market-based mechanisms for coastal adaptation. Further, by making explicit the costs and benefits of early adaptation and protective actions, it will take an evidence-based approach to raise awareness of the private sector in coastal areas, especially the tourism industry players, and secure its buy in and engagement into the new financial and insurance systems, including the upgraded National Fund for the Protection of Tourism Zones. The project will also take advantage of the growing trend to evaluated the economics of adaptation (e.g., GWP-UNDP regional initiative) Insurance companies are not willing and incentivized to study the feasibility of adapting disaster risk or property insurance and do not think the hotels and property owners are willing to engage in an insurance scheme
Lack of continued Monitoring and Evaluation to document lessons learned from soft protection measure applications	Medium	Soft technique data will be collated in a systematic manner to inform decision-making processes. Also M&E mechanisms for the new soft interventions will appraise effectiveness and interventions in a specific coastal system context to allow successful transfer and up-scaling around the country
Data sharing for risk assessments is hindered by lack of coordination / willingness of agencies to share data	Medium	Data will be centralized in the existing Information System for Decision Aid (SIAD) housed at APAL. The SIAD system includes a website which will be improved to facilitate data exchange with other sectors in Tunisia.
Water and coastal management strategies are made ineffective by an unanticipated increase in the frequency of flood events, coastal surges which jeopardizes coastal protection and water conservation measures and damages coastal monitoring infrastructure	Medium	Management plans will take into account worst case scenarios of extreme weather and climate change to have a margin of safety for applied interventions. Also, robust equipment will be procured including spare parts and technical personnel will be trained to maintain equipment and any soft solutions applied.

Emphasis on shared coastal management and coordination between private hotels and NGOs and/or the municipality is hindered because of self-interests and contrasting agendas	Medium to High	Financing will be granted to a joint NGO or community group and hotel or private sector collaboration to implement coastal adaptation measures. NGOs are already motivated (ASSIDJE, etc.) and have the knowledge and ability to perform public awareness on coastal erosion. With training from APAL, the NGOs will become capable and can act as locally-sourced manpower to implement interventions for both public and private beaches. Also the Green Economy Initiative will facilitate a future PPP by supporting potential green economy / green industry with an initial market study on the feasibility of using locally-sourced palmivelles as a form of fencing to capture wind-driven sand. The idea is to support the community by creating jobs while developing a private industry to lead palmivelle production.
NGOs/CSOs do not have sufficient financial literacy to manage funds for small-scale coastal adaptation projects	Low	The third component includes training for NGOs/CSOs by a national financial expert so that they can manage SCCF funds for small coastal adaptation projects. Also, one selection criterion to choose NGOs to implement coastal adaptation project will include the demonstration of a good track record in implementing and managing projects.

2.6 Cost-effectiveness

190. The project makes the maximum use of SCCF funds by acting as a strategic next step to the African Adaptation Project which ended in 2012. The AAP's vulnerability mapping acts as the basis for site selection. Also, complementary activities which were highlighted as lacking but necessary in the AAP's final evaluation are planned to be realized in the SCCF financed project. An example is the need to find diversified methods of financing to cover the costs of adaptation to climate change on local, regional and national levels which will be achieved in Outcome 3 of the project. Similarly, due to previous support by the PEE project in deploying and operating existing coastal monitoring infrastructure, SCCF funds will be used to build APAL's capacity in assigning appropriate government budget lines for continual Operation and Maintenance.

191. SCCF funds will be the only funding source currently used to build the capacity of APAL to use a Whole of Systems approach so that soft coastal adaptation measures consider the watershed and ecosystems for a long-time frame. This knowledge will be transferred to other projects at the baseline to adopt such long term resilience building approaches. Natural functions of complex and dynamic, coastal watershed systems will be supported to achieve long term resilience. For example, coastal estuaries and bordering wetlands will be supported to act as a natural buffer, absorbing floodwaters and dissipating storm surges. Similarly, beaches will be reinforced with vegetated coastal dunes and coastal aquifers will be properly managed to reduce saltwater intrusion. Additionally, local plants and native materials will be adopted to offer cost-effective protection measures. Many of the soft protection measures can be constructed, implemented and monitored using local manpower.

192. The SCCF financed project will further ensure cost-effectiveness by building APAL's capacity to use existing coastal monitoring data (such as that collected in the PEE project) to generate risk-based spatial management plans. Although the plans will be targeted to the pilot areas, recommendations can provide possible cost-effective coastal protection measures which can be transferred to other baseline interventions due to their low-cost, exploitation of native plants and materials and relative simplicity to implement. (NGOs can be trained to stabilize dunes for instance. Contracted engineers would not be required.) Recommendations will be based on enhanced use of existing coastal monitoring data; SCCF funds will build APAL's capacity to evaluate coastal protection measures based on a range of climate scenarios.

193. All on-going and planned interventions will benefit from the updates to regulatory frameworks and to development planning tools because existing and planned coastal protection assets will be safeguarded from unsustainable development (such as within the Maritime Public Domain). Development will be limited in high risk areas as identified and noted in frameworks and policies. (High risk being where threats of flooding and erosion exist.) Construction of hard coastal protection measures, which will most likely need to be replaced due to repeated flooding and continual erosion, will be avoided. Furthermore, regulatory reform (such as with the Environmental Impact Assessment) will mandate the use of climate-resilient construction so current investments are more sustainable. Also, any planned interventions will benefit from SCCF examples on how to deter development in high risk areas (e.g., introduction of property insurance and Transferrable Development Credit systems).

194. To choose the specific sites and associated soft adaptation measures for Outputs 2.1 (Component 2), a detailed cost-effectiveness analysis has been conducted. The specific sites were chosen based on a screening analysis using the following evaluation criteria.

Does the site have the following attributes?

1. Highly vulnerable to climate change
2. Strong community leadership and social networks
3. Willingness of communities/demand by communities to try new adaptation approaches

4. Existing capacity development or investments which a potential adaptation initiative could be linked to
5. Return on investment likely to be greatest
6. Accessibility in light of the need for ongoing monitoring and evaluation

The adaptation options analysis (summarized in Annex 2a) is built upon a number of Focus Questions that consider:

- The identification of context-appropriate interventions;
- Evaluation of the applicability of specific interventions to address adaptation goals; and
- Prioritisation of options for further consideration by key stakeholders.

195. The Focus Questions were designed to enable comparisons between the conventional adaptation options (i.e. typically delivering a smaller range of services that are easier to quantify) with Whole of Systems based options (i.e. deliver a greater range of options that are more difficult to quantify). The output of this type of analysis is a set of recommendations for adaptation at a given intervention site to form the basis of further stakeholder consultation. At this stage of project development, a shortlist of options has been provided for each target site and an associated budget for implementation allocated. A participatory consensus driven process will be adhered to through the site specific risk assessment phase for both target sites at the outset of implementation to gain widespread validation of the indicative options selected.

196. To further enable cost-effective implementation, training programs and workshops on improving the capacity to design and maintain coastal adaptation have been consolidated. A coherent training programme was emphasized where one activity can cost effectively satisfy more than one of the needs identified, such as group training for tourism representatives on adaptation options. Also, the project will coordinate with other baseline programs which have capacity building activities in order to ensure that money is spent wisely. For instance, SCCF funds will provide training on the economics of adaptation which is complementary to similar training on national and regional levels provided by the ***Capacity Development on Economics of Adaptation, Water Security and Climate Resilient Development in Africa*** initiative. The proposed project will also exploit the regional ***MedPartnership*** programme's provision of tools and methodology reinforcement for mainstreaming climate considerations into national ICZM planning.

197. Moreover, the ICZM inter-ministerial platform, which will be formed with SCCF funds, will ensure that all relevant cross-sectoral data is used in development planning. The platform will set a precedent on how to coordinate between agencies and share data relevant to coastal planning. Additionally, capacity reinforcement for APAL to generate cost benefit and economics of adaptation analyses will ensure that APAL's coastal protection recommendations minimize additional funding needed for adaptation. Maladaptation costs resulting from sunk-costs or costs of delayed decisions will be reduced, thereby freeing financial resources for additional coastal protection measures.

198. Furthermore, the chosen set of Outputs was reviewed in a validation workshop and based on Stakeholder consultations during three separate site visits. The Outputs outlined have been chosen based on their financial feasibility and have been chosen over alternative ways to address project barriers as shown in Table 7 below.

Table 7: Demonstration of Cost-effectiveness for each proposed Output indicating the project barrier addressed

OUTPUTS	Barrier Addressed	**Alternatives Considered**
1.1 Regulations and enforcement mechanisms governing coastal land use and EIA strengthened to include climate risks management requirements, with a particular focus on siting and construction of infrastructure and tourist facilities	Existing coastal development planning and regulatory frameworks do not support anticipatory and integrated management of climate change risks	**Alternative 1:** Rely on existing legal and regulatory frameworks; however these frameworks are not adapted to facilitate coastal adaptation and to deter development in vulnerable zones. They also do not consider future projections of sea level rise and associated impacts.
1.2 Advanced coastal risk assessment and adaptation economics tools for planning introduced at 4 planning authorities (APAL national and 2 regional branches, Bureau of Tourism and the regional governments) delivered to 200 key technical staff and decision makers for them to understand and respond to the impacts of climate change induced risks/disasters on coastal infrastructure, economies and livelihoods	Limited expertise and knowledge of various risk assessment and decision support tools for adaptation planning early responses and/or medium-term to long-term risk management	**Alternative 1:** Use only average SLR scenario (1m by 2100). This does not facilitate a timed, prioritized approach to adaptation or provide an adequate platform for flexible adaptation pathways to be implemented. **Alternative 2:** Develop costs and benefits of adaptation options within each agency/Ministry: In order to optimize management plans, cross-sectoral coordination and information sharing is required. Data must be exchanged to develop true costs and benefits which reflect the range of socio-economic and environmental benefits for all options. **Alternative 3**: One-time training on the economics of adaptation: This project will train, in a staged manner, representatives from various ministries in accordance with the Global Water Partnership. Budget has therefore been allotted to provide periodic training.
1.3 Hardware and software delivered to improve observation capacities, data collection and treatment (topographic and	Limited expertise and knowledge of various risk assessment and decision support tools for adaptation planning	**Alternative 1**: Have separate data portals for each agency to ensure security: however, this would prohibit the easy use of data across agencies. **Alternative 2:** Acquiring more equipment: This project is focusing on effectively using data rather than on excessive equipment procurement. Existing coastal data is generally

OUTPUTS	Barrier Addressed	Alternatives Considered
bathymetric surveys, MIKE11 flood and coastal surge modelling software and SEDSIM, Fortran for sediment process modelling)	early responses and/or medium-term to long-term risk management	of sufficient quality to update impact analyses and risk-based spatial management plans (as evidenced by the comprehensive vulnerability map produced in the AAP project in 2012). Relevant ministries require capacity reinforcement on how to use this data appropriately and how to coordinate with other ministries to integrate relevant information to support ICZM.
1.4 In at least 2 vulnerable coastal regions and municipalities (Northern coast of Tunisia and Djerba), spatial plans (Agenda 21, PAU) developed based on impact scenarios, shoreline management planning and cost-benefit analysis of adaptation options	Existing coastal development planning and regulatory frameworks do not support anticipatory and integrated management of climate change risks	**Alternative 1:** Do nothing. The existing approach involving reactive treatment of impacts will continue in-country to the detriment of naturally functioning coastal processes and healthy sustainable ecosystems with their associated service provisions. Medium and long term impacts of climate change will not be considered and vulnerability will increase across key sectors (tourism, agriculture, fisheries, water). **Alternative 2:** Rely on the existing National Tourism Strategy 2016 to move development inland: By nature of Tunisia being dependent on port trade, development disincentives are required to deter unsustainable development along the coast. The Island of Djerba is already at maximum capacity so the creation of a new system to be managed locally, can incentivize development away from the Maritime Public Domain. Through SCCF funds, municipalities in the 2 project zones will build capacity on the concept of Transferrable Development Credits. This new development incentive idea has shown much success in other countries (e.g., USA) and will be tested in the SCCF financed project.
2.1 Shore protection practices and technologies to mitigate long-term risks from SLR introduced in the region northwest of the Gulf of Tunis and on Djerba island	Limited understanding of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions Limited Monitoring and Evaluation (M&E) of coastal protection interventions	***See separate analysis for a summary of discrete alternatives considered at each target site, Annex 7.*** **Alternative 1**: Use hard measures alone. The existing issues with coastal degradation continue as the indiscriminant use of hard structural techniques causes disruption of natural coastal processes (e.g. loss of beach adjacent to shore-perpendicular works such as groynes; loss of sediment in areas on front of seawalls; decrease in water quality within enclosed breakwater systems). **Alternative 2**: Use soft measures in an ad hoc manner without integration in a wider programme of sustainable, coastal management that adopts a systems approach and acknowledges the importance of healthy functioning ecosystems and the services they provide. The introduction of soft measures at a target site may work to treat the current management problem at that specific location. However, it is unlikely that the

OUTPUTS	Barrier Addressed	Alternatives Considered
		intervention will be sustainable in the medium to long term unless it occurs as part of a wider attempt to manage the coastal system. In addition, 'point' application of an intervention that fails to consider the functioning of the system as a whole may result in negative impacts for adjacent coastal areas (e.g. encouraging sediment capture and storage at one location may treat an existing erosion problem at that site but cause increased erosion up or down drift). **Alternative 3:** Use soft measures within an Integrated Coastal Zone Management (ICZM) framework that does not incorporate a consideration of climate change risks at a range of timeframes and scenarios. These management efforts will facilitate good practice in terms of dealing with current pressures but do not build a platform for sustainable solutions with a medium to long term horizon. Coastal management that includes a blanket 'factor of safety' in an attempt to cater for future climate related impacts runs the risk of over adaptation or maladaptation which is at odds with the accepted benefits of flexible adaptation pathways that can help to manage the long-term and uncertain nature of climate change impacts. The approach uses risk-based decision frameworks involving thresholds and trigger points for making systematic adjustments in response to new information and changing circumstances. It employs robust adaptation actions in a timed manner that work across a wide range of circumstances both now and in the future (as opposed to those that are optimised for present-day conditions or a single future outcome that ignores uncertainty).
2.2 Improved water management and savings practices for coastal fresh aquifer resources implemented in both project zones to prevent saltwater intrusion resulting from SLR	Limited understanding of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions	**Alternative 1**: Rely on hotels to be self-motivated to conduct water recycling and desalination measures: Only a few hotels have tried to manage water resources so that less potable water is wasted and more saltwater is desalinated. The incentive for these limited hotels has been the economic benefit. SCCF funds are planned to develop guidelines for best practices on water management in hotels from an economic and environmentally-friendly perspective. Hotels are more likely to accept new water management practices if an in-depth economic and technical study is provided to them which clearly indicates the best options. **Alternative 2:**.Continue irrigating in the current fashion: Tunisia's agricultural sector uses over 80% of the fresh water supply. Farming methodologies are water intensive. A study on the potential of irrigation by non-conventional water (treated and/or desalinated wastewater) is necessary in both sites to find appropriate water-saving irrigation methods.
2.3 Technical capacities,	Limited understanding	**Alternative 1**: Rely on the end result of pilot projects to ensure replication: Soft

OUTPUTS	Barrier Addressed	Alternatives Considered
institutional functions and associated budgets in place at the APAL and municipalities including NGOs/CSOs for the maintenance, monitoring and expansion of the introduced shore protection and coastal adaptation practices	of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions Limited Monitoring and Evaluation (M&E) of coastal protection interventions	adaptation measures require significant Monitoring and Evaluation to be able to track sediment balances, water quality and other quantitative indicators. Currently, APAL is not systematically recording quantitative indicator data to detect soft protection measure failure so as to establish appropriate benchmarks to monitor change or collect appropriate data through the establishment and ongoing implementation of the intervention mean that positive contributions are difficult to quantify. Conversely, monitoring may be attempted in some instances (e.g. Ganivelles established through the AAP project in Djerba) but data and information not evaluated in a robust or timely fashion. **Alternative 2:** Business As Usual for oceanographic monitoring equipment (one time investments): Ocean monitoring equipment must be relatively robust and technical personnel must be able to fix equipment in the field. Operation and maintenance costs are significant for wave and tide monitoring equipment because of the extreme conditions in which they monitor (salt corrosion, extreme winds and wave energy). Capacity must be built within APAL to have sufficient budget lines to support continual O&M including the provision of spare parts.
2.4 Coastal risk monitoring and early warning mechanisms focusing on SLR-induced erosion, urban flooding designed and introduced	Limited understanding of a Whole of Systems approach as a means to address current and anticipated climate related risks in the coastal regions	**Alternative 1**: Rely on existing interventions to support coastal early warnings: Although APAL works with a regional center for early warning on Tsunamis, it does not have the capacity to predict more local extreme weather events such as flooding and coastal storm surges. Data is not shared effectively with the National Weather Service to produce useful forecasts. Most importantly, there is no standard communication protocol which details how information producers should interact to produce alert for coastal regions and how to disseminate the alert to the Navy National Guard, beacons and lighthouses, etc.
3.1 Investment mechanisms for community based coastal adaptation developed and initiated in both project regions with participation of key tourism operators (Djerba) and farmers (Northwest of Gulf of Tunis)	Inadequate means to mobilise funds for risk-reducing and adaptation activities on public and private levels	**Alternative 1:** Continue implementing coastal protection measures without shared management and guidance: Hotels are implementing the incorrect coastal protection measures (e.g., loss of beaches adjacent to shore perpendicular measures such as groynes as well as ill-conceived breakwater structures that have created problems with poor water quality and degradation of beach amenity). It is well-established that developing private public partnerships is a good method to ensure sustainability of actions past donor project completion. The private hotel sector is unaware of appropriate coastal adaptation techniques whereas many NGOs, particularly in Djerba are environmentally-conscious can help with adaptation measure implementation under the guidance of APAL. **Alternative 2**: Cash for work: This concept has not worked successfully in Tunisia. It also does not provide a sense of ownership.
3.2 Innovative financing	Inadequate means to	**Alternative 1:** Business as usual, existing funds acting in parallel: The numerous

OUTPUTS	Barrier Addressed	**Alternatives Considered**
instruments introduced and existing funding mechanisms enhanced from national and international sources to support coastal adaptation	mobilise funds for risk-reducing and adaptation activities on public and private levels	environmentally-focused funds have no power or know-how to access national funds and expand financing mechanisms to include support from donors. By organizing these funds together in and Environmental Fund Management System, a national finance expert can properly capitalize the funds with a diversified portfolio of investing techniques. **Alternative 2**: Use existing governing mechanisms for national financing schemes: As the Tunisia Report for the Conference on Sustainable Development (Oct 2011) indicated, Tunisia suffers from corruption and a lack of transparency for financial transactions. As the Transparency International: Global Corruption Report (2011) recommends, transparent governing mechanisms are required to ensure there is accountability with fund management.
3.3 Insurance and property development credits that provide effective risk sharing and risk reduction incentives in coastal built environments designed and introduced amongst 500 highly exposed businesses and households	Inadequate means to mobilise funds for risk-reducing and adaptation activities on public and private levels	**Alternative 1:** Weather index based insurance: Weather index-based insurance is preferred when there is a measurable threshold that is surpassed to trigger payouts. However, Sea Level Rise is gradual and measured only over long time periods and has not been able to be included in existing WII products. WII products are generally best applied in situations when weather sets off a trigger. For instance, WII is appropriate for an agricultural scheme when flooding or drought occurs and can easily be measured by weather stations and satellite data.

2.7 Sustainability of the project

199. The project aims to empower the public and private sector to self-implement coastal adaptation projects. SCCF funds will be used to build the capacities of NGOs and local community members to implement and monitor coastal adaptation activities. As NGOs are the most active voices in the communities and the most knowledgeable on climate change, the project will further empower them to have financial literacy and the technical know-how to implement soft coastal protection measures.

200. SCCF funds will also be used to integrate adaptation options and associated budgets into national development plans. In effect, the project will support Tunisia to move away from a reactive adaptation approach to more proactive and anticipatory approaches to adaptation. At the same time, it will facilitate the ability to sustain and, just as equally important, monitor and evaluate soft coastal protections interventions.

201. The project will also identify a mix of financing sources and appropriate fund channeling mechanisms for coastal adaptation by exploring both the international climate change financial landscape as well as domestic financial resources. It will build the capacity of the government to leverage funding from external sources to complement national dedicated budgets for the environment and adaptation. It will simultaneously seek to strengthen the ability of the Tunisian government to use the traditional financial mechanisms at its disposal to catalyze additional funding resources for priority adaptation actions.

202. The project will use SCCF funds to provide joint grants to incentivize shared management of the coast by both the local communities/NGOs and the private hotels. Such grants will only be disbursed based on a set of criteria such as the motivation of hotels to work with the community or NGO experience in implementing and managing projects. The funds will be used to implement plans to be generated in Component 1. By promoting shared management, it is more likely that the public and private sector will work in coordination in the future. SCCF funds will also support women-run nurseries to provide local plant species to be used for dune fixation. If lucrative these nurseries can be a sustainable source of plants for future soft coastal adaptation measures such as living shorelines.

203. At the same time, SCCF funds will be used to leverage partnerships to be created with existing projects to ensure that there is no duplication of activities. Activities within the project ensure that the SCCF financed project will coordinate with other initiatives by building capacities on levels where other projects are not. An important partnership which will be created will be with the Green Economy Initiative (GEI). The SCCF financed project will work with the GEI to promote palmivelle production, a soft protection measure, which will include the creation of green jobs and potentially a green industry.

204. Overall, the most notable contribution of the SCCF financed project will be to enable coastal development agencies to have the knowledge on how to apply a Whole of Systems approach for coastal management practices which can be sustained for the long-term.

205. Finally, various activities will support the project's sustainability after the support of the SCCF ends. These include :

- Staged approach to training;
- Capacity building on the Whole of Systems approach to coastal risk management;
- Adoption of coastal protection measures based on engaging both the public and private sectors including local representatives and NGOs/CSOs;
- Development of a guidance package for national, local authorities and tourism sector representatives on coastal risk mitigation options;

- Knowledge tours to promote the transfer of best practices for ICZM and soft coastal protection measures;
- Capacity building to incorporate recurring costs into government budget lines;
- Facilitating climate-smart water use and the application of innovative re-use technologies so that there will be sufficient water supply for potable and irrigation use in both target zones.

2.8 Project replicability

206. In order to ensure project replicability, this project has focused on updating regulatory and legal frameworks so as to place importance on climate change and associated sea level rise projections as well as to facilitate coastal adaptation measures using an integrated Whole of Systems approach.

207. Technical studies conducted under Component 1 will provide a vision and a roadmap to guide ICZM interventions for coastal resilience for the future. The guidance package for national, local authorities and tourism sector representatives on coastal risk mitigation options will provide both the public and private sector with targeted information for up-scaling.

208. The project has also considered that the needs for coastal adaptation are too great to cover all vulnerable coastal regions. As a result, capacity building on ICZM will be provided to APAL so that they can design and implement integrated coastal protection measures in the future. In fact, the coastal adaptation measures have been developed to be easily scaled-up and modified to serve other coastal communities vulnerable to climate change.

209. The creation of a National ICZM platform will assist with improving coordination of ICZM projects, programmes and activities on local, national and regional levels so that funds can be used wisely and additional protection actions can take place in the future. In addition, SCCF funds will also be used to create an Environmental Fund Management System. This will include managing all existing national environmental funds so that they can have more collective bargaining power to attract continued capitalization. Any activity or improvement to an activity will be more likely replicated because funds will be effectively mobilized for future interventions. Subsequently, the funds will be allotted to prioritized adaptation measures.

210. The project will also focus on building national capacities on the economics of adaptation (i.e., investment appraisal) for various sectors including APAL, ANPE, NGOs, CSOs, municipality representatives, tourism operators, port representatives and the Federation of Insurers. By implicating and building awareness of multi-sectors so that they understand the costs and benefits of coastal adaptation options, they are more likely to come to a consensus on appropriate development in the future. They will also be able to develop sound planning for future coastal development.

2.9 Stakeholder involvement

2.9.1 Stakeholder baseline analysis

211. The project design was formulated as a result of extensive bilateral and multilateral stakeholder consultations in the project zones which took place in July, August and December 2013 as well as three comprehensive workshops. The goal of stakeholder consultations has been to identify relevant agencies involved with supporting coastal adaptation and innovative economic instruments. Consultations have ensured the proposed project is grounded in local realities whilst being aligned to national policy.

212. The following Table 8 shows the list of consultations which have taken place to develop the project document. The project outcomes, outputs and activities are based upon the recommendations of the Stakeholders given the technical, operational and financial constraints of the project. The role and participation of each agency is indicated by the column headings described in the legend.

Column Heading Legend

National Inception Consultation – participated in national inception workshop or first mission consultations

Technical Validation Workshop – participated in the technical workshop

Validation Workshop – participated in the validation workshop

Baseline Assessment – consulted to provide baseline situation during project development

Management Arrangements – identified as a member in the project management arrangements (e.g., Steering Committee, etc.)

Risk/Barrier Analysis – consulted to document their view of specific institutional risks or barriers

Policy/ Strategic alignment to priorities – institution has policies/strategies or implements policies / strategies aligned with project priorities

Co-financing Identification – institutions / organizations which have other projects or existing material to support and be supported by the project financially

Gender representation – organization which is concerned with promoting the involvement of women during project development and implementation

Upscale / Sustainability planning – responsible for scaling-up (duplicating) the project and reinforcing the sustainability of activities after project completion

Potential Partnerships – Memorandums of Understanding obtained between ministries and institutions to support project implementation

213. Furthermore, women have been considered in project development and will continue to be implicated in project implementation. Women are an important target group because they are more dependent on natural resources for their livelihoods. Climate change has a strong impact on the expected women beneficiaries who are living in rural regions and have limited mobility. In addition, women may be excluded from some activities due to cultural norms, or due to lack of capital and ownership arrangements that confer all rights to men in the family (Buhl 2005; Eriksen et al. 2007). This inequality is compounded by a lack of opportunities arising from limited access to education and information services which prohibit participation in decision-making. Due to all of these reasons, this project is targeting women as potential beneficiaries of SCCF grants to support nursery development to produce locally-sourced, native vegetation which will be used in the extensive kilometers of coastline to be vegetated.

Table 8: Stakeholder Involvement Matrix

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale / Sustainability planning	Potential Partnerships
Federal/Sector									
APAL	X	X	X	X	X	X		X	X
DGSAM	X	X		X	X	X		X	X
DGQEV	X	X	X	X	X	X	X	X	X
ANPE	X	X	X	X	X			X	X
Ministry of Agriculture	X	X	X	X	X		X	X	X
DGAT	X	X	X	X	X	X			X
APIP	X			X	X				X
ONTT	X	X	X	X	X			X	X
AFT	X	X	X	X	X			X	X
Ministry of Finance			X		X				X
OMMP									
Ministry of transport					X				X
ANGED			X		X				
Technical / Research Institutions									

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale / Sustainability planning	Potential Partnerships
INM	X	X	X	X	X				X
INSTM	X	X	X	X	X			X	X
SHO					X				X
OTC					X				X
CNT	X	X		X	X				X
OSS	X	X		X	X				X
IRA	X	X		X	X				X
Private Sector									
Fédération Tunisienne des Sociétés d'Assurance (FTUZA)	X			X					
Chamber of Commerce for Industry									X
Fédération des hôtels Jerba-Zarzis	X	X	X	X		X		X	X
FTH	X	X	X	X		X		X	X
Tunisie Holiday	X	X		X		X		X	X
Dar Jerba	X			X				X	X
Hôtel Jazira	X					X		X	X
Regional / Sector									
CRDA – Medenine	X	X			X			X	

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale / Sustainability planning	Potential Partnerships
CRDA – Ariana					X				
CRDA - Bizerte					X				
Municipalité de Houmet Souk	X	X		X	X			X	X
Municipalité de Midoun	X	X		X	X			X	X
Municipalité de Ajim	X	X		X	X			X	X
Municipalité de Kalaât EL Andalouss	X	X		X	X			X	X
Municipalit2 Ghar El Melh					X			X	
ONAS JERBA	X				X			X	
SONEDE JERBA	X	X			X	X		X	
NGOs/CSOs									
OSC Jerbienne	X	X		X	X		X	X	X
Association Djerba Ulysse	X	X		X	X		X	X	X
Association pour la sauvegarde Jerba, ASSIDJE	X	X		X	X		X	X	X
Association scientifique Kalat Andalous	X	X		X	X		X	X	X
RANDET					X				X
TUNWET					X				X

Stakeholder	Inception Consultations	Baseline Assessment	Management Arrangements	Risk/Barrier Analysis	Policy/ Strategic alignment to priorities	Co-financing Identification	Gender representation	Upscale / Sustainability planning	Potential Partnerships
WWF					X		X		X
2C2D					X		X		X
Donor Partners									
UNDP	X	X			X	X	X		X
JICA					X	X	X		X
Saudian Fund						X			X
World Bank					X		X		X
GIZ					X	X	X		X
FFEM							X		X
BAD							X		X
KfW						X			X

2.9.2 Stakeholder involvement plan

214. The Stakeholders identified during project preparation will continue to be implicated in project implementation. A Stakeholder involvement plan has been created to provide a framework to guide interaction between implementing partners and the key stakeholders, particularly end-users to validate project progress. All Stakeholders involved in the baseline self-capacity assessment will be addressed again in order to track the efficacy of Stakeholder capacity building both operationally and technically. Gender-focused NGOs/CSOs will have the role of conducting gender disaggregated surveys indicating involvement in coastal adaptation measures such as nursery development. Details of the Stakeholder Involvement Plan are indicated in Annex 6.

2.9.3 Expected Benefits

215. With support from SCCF, UNDP will help Tunisia undertake a paradigm shift from crisis reactive management to anticipatory climate risks management. UNDP will assist Tunisia's government, institutions, private sector and populations in making the necessary changes in existing policies and practices so as to ensure that coastal development and planning processes adjust to the new patterns of constraints and risks associated with climate change. By strengthening the resilience of coastal regions and promoting new policy options for the long term management of SLR-induced shoreline changes (including managed retreat and setback zones), the project will provide a tangible contribution to the socio-economic well-being of the country.

216. Specifically, the proposed project will generate significant socio-economic benefits to at least 150,000 coastal inhabitants of Tunisia. The project will provide for a direct investment in the robust and climate resilient adaptation measures on 22 km of the most sensitive segments of the coastline and 670 hectares of wetland of ecological importance. The measures will be carefully selected and designed based on coastal topographic profiles, type of land use and existing infrastructure, level of exposure - concentration of settlements and economic assets and range of expected SLR and related impacts.

217. By improving the sustainable management and resilience of coastal natural features (such as dunes, estuaries, aquifers and beaches) the Tourism sector will greatly benefit from SCCF financed interventions. Hotels, shops and restaurants directly employ 13,000 people in Djerba alone. Between 50 and 60 percent of these employees are women.

218. The project will enable 500 artisanal farmers and 4,400 fishermen (many artisanal) to continue with their livelihoods and become more resilient to climate change. In Djerba an improvement in water quality in El Hachani will support sustainable fishing. Similarly, in the northwest region of the Gulf of Tunis, management of sediment transport in a manner which is aligned with pre-existing natural conditions will decrease the sedimentation and silting of the port. Fisherman will be able to recommence or continue their fishing practices with increased port access. Finally, it is expected that the water recycling, conservation and management actions in Component 2 will decrease the salinization of agricultural land in the Mejerda valley and on Djerba Island. In the Mejerda valley alone, 5,000 hectares of agricultural land will have improved conditions. Overall, of the beneficiaries who will benefit from improved fishing and agricultural livelihoods, approximately 20% are expected to be women.

219. In Djerba, the project will be used to boost the resilience of women active in artisanal tasks such as cloisture fishing. The project will also target women to create nurseries so that they can cultivate native plants to be used for dune fixation and plant ridges. The plants and planting services will be sold to private residences and hotels. If the nurseries prove to be lucrative, it is likely that an existing micro-finance scheme in Tunisia will be used to scale-up nursery operations. A possible application of scaling-up will be to provide plants to Living Shoreline applications throughout Tunisia (such as in the

Mediterranean) which would require kilometers of dune fixation vegetation to be planted. Such an approach will also facilitate women's access to financial services.

220. The proposed project will significantly strengthen the capability of key provinces in Gulf of Tunis, Northern coast of Tunisia and Djerba to identify, plan and implement the adaptation measures that will deliver greater welfare impacts to the local population and economic sectors. The project will considerably improve the technical capacities of the National Observatory, APAL and other associated agencies that are responsible for the coastal protection and early warning services. A range of methods and tools for coastal risk assessment, hazard mapping, oceanographic modelling and adaptation planning will be introduced and at least 150 professional staff will improve necessary skills and knowledge through series of targeted trainings.

221. Given the magnitude of the SLR challenge in Tunisia, a single grant investment, no matter how significant, will not suffice to address it fully. The project therefore will mobilize additional internal resources in the country as well as from international sources to improve the capitalization of existing funds. It will also introduce property insurance and a transferrable development credit system to drive future investments away from the vulnerable areas and make the tourism and associated infrastructure more climate compatible. The project targets to mobilize at minimum of USD 10 million for coastal adaptation from various sources, including existing environmental funds by the end of the project.

222. The UNDP Environmental and Social Screening template has been applied to ensure environmental and social safeguards are in place. According to this checklist, the project is considered Category 3a (See Annex 8). According to this categorization and Tunisian law, a more detailed Environmental Impact Assessment has been budgeted in Component 2. Also, the following environmental and social safeguards are being applied.

223. Environmental safeguards:

- Establishing vehicle access pathways which clearly designate routes to ensure no ad hoc degradation of dune areas occurs.
- Building the capacity of APAL to understand concepts of ecological sustainability and to better integrate social and community values and aspirations into engineering decisions, thereby adhering to Integrated Coastal Zone Management.
- Ensuring either the property owner(s) or government officials monitor the soft measures effectiveness in preventing erosion. This will help determine if the current strategy is working to control erosion or if the strategy needs to be adjusted to address changes in conditions. The on-going monitoring and evaluation of the living shorelines strategies will ensure that if die-out occurs, the problem will be assessed and quickly mitigated with re-vegetation.
- Implementing demonstration projects in the target areas that are visible, with accompanying community awareness raising and education campaigns which will help raise understanding of the soft approaches and how they can be as effective (or more) as structural stabilization techniques and more sustainable and cost-effective in the long-term.

224. Social safeguards:

- Consulting villages to determine "real" coastal risks which will be fed into the risk-based spatial management plans
- Facilitating feedback from marginalized populations on the appropriateness of ICZM interventions by involving community stakeholders from inception in planning to protect and restore the natural shoreline
- Educating property owners and other stakeholders on how to maintain living shorelines and monitor the progress of adaptation measures
- Knowledge sharing with international tourism operators on cost-effective best practices for coastal adaptation and coastal erosion risk management

- Financial management and literacy training for NGOs and community members who partake in coastal adaptation project implementation

3 PROJECT RESULTS FRAMEWORK

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:

CPAP OUTPUT: Not applicable, CPAP still being drafted

Country Programme Outcome Indicators:

Number of regional development plans elaborated which integrate land use specifications and environmental aspects

Primary Applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):

1.4.1 Number of countries with systems in place to access, deliver, monitor, report on and verify use of climate finance

1.4.2 Number of countries with comprehensive measures – plans, strategies, policies, programmes and budgets – implemented to achieve low-emission and climate-resilient development objectives

Applicable GEF Strategic Objective and Program:

Objective 2: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional and global level

Applicable GEF Expected Outcomes:

Outcome 2.1: Mainstreamed adaptation in broader development frameworks at country level and in targeted vulnerable areas
Outcome 2.2: Increased adaptive capacity to climate change in development sectors
Outcome 3.1: Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures

Applicable GEF Outcome Indicators:

- Number and type of development frameworks that include adaptation measures
- Number and type of natural resource assets created, maintained or improved to withstand conditions from climate variability and change
- Number and type of development frameworks and sectoral strategies that include specific budgets for adaptation actions

	Indicator	**Baseline**	**Targets End of Project**	**Source of verification**	**Risks and Assumptions**
Project Objective[47] To promote innovative adaptation strategies, technologies and financing options to address the additional risks posed by climate change on populations and key	1.Amount of public funds mobilised to support coastal adaptation	Tunisia's 2008 SNC coastal study indicated that the economic impact of climate change related SLR on agriculture and tourism is expected to cost 0.63% of the GDP/year, or approximately US$1 billion. The current national coastal protection budget is limited at 10.4 m USD. This budget is being used to support site-specific projects, using predominantly hard engineering interventions, to	1.TARGET: By the end of the project, a disbursement of at least 10 m USD is accrued from public sources and earmarked for coastal adaptation	1.Government budget lines committed to coastal adaptation	ASSUMPTION: The Government of Tunisia has enough incentive to mobilise funds which can be effectively targeted towards coastal adaptation activities in a transparent manner with appropriate financial management

[47] *Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR*

socio-economic sectors in Tunisia's most vulnerable coastal areas	2.Djerba:Percentage of coastal hotels working in cooperation with local municipalities to implement locally-sourced, naturally available soft protection measures (e.g., sea grass and sand layering)	reduce coastal erosion. Current interventions do not consider the use of an integrated approach to adapt to climate change (e.g., holistic watershed thinking or a Whole of Systems approach). 1. BASELINE: Limited domestic financing mechanisms for coastal adaptation exist and no financing exists on regional and local levels Furthermore, the issues of coastal erosion, submersion, salinization and flooding are exacerbated by a limited number of applied coastal adaptation responses which take into account the long-term implications of CC. Diversified, locally-sourced and environmentally-friendly coastal protection technologies are required. 2. BASELINE: Only four hotels are employing soft protection measures to support coastal erosion (ganivelles and geotubes). However, such soft interventions are being made ad-hoc without an idea of upstream hydrological, ecological and geomorphological processes.	2. TARGET 50 coastal hotels in the targeted areas implementing soft protection measures in alignment with recommended adaptation options outlined in Djerba's risk-based spatial management plan (Component 1)	2.APAL monitoring logs of soft, coastal adaptation measures in Djerba	ASSUMPTION: There is sufficient technical capacity within APAL for successful execution and implementation of the project RISK; Water and coastal management strategies are made ineffective by an unanticipated increase in the frequency of flood events and drought which jeopardizes coastal protection and water conservation measures RISK: Insufficient institutional engagement and coordination may prevent successful project delivery in the current transitional context in Tunisia

	Indicator	**Baseline**	**Targets** **End of Project**	**Source of verification**	**Risks and Assumptions**
Outcome 1 Institutional capacity to plan	1.Number and type of policy or legal frameworks	1. BASELINE Currently, in Tunisia there have been no concrete steps taken to incorporate climate change	1. TARGET: at least three pieces of regulation governing coastal	1. Review of the DPM, EIE, Code d'Environnement and	ASSUMPTION: Institutions have the will and ability to

for and respond to increasing climate change risks in coastal areas is improved	informed by coastal dynamic modelling and adopted to account for coastal risks	(CC) risks into policy and legal frameworks governing coastal management. Spatial planning regulations, building codes and Environmental Impact Assessments do not consider anticipated impacts of CC and erosion and flooding risks on the built environment, especially in tourism districts. Current rules for setbacks for coastal development are not based on site-specific assessments and do not consider well-established risk (e.g., Sea Level Rise, SLR).	management (such as, the Maritime Public Domain (DPM), Environmental Impact Assessment (EIE), the Code of Planning and Urban Development (CATU) and the new Environment Code) updated to consider SLR, erosion and coastal flooding in their policies / legal frameworks	the Code de l'Aménagement du Territoire et de l'Urbanisme (CATU)	engage in long-term planning to mitigate potential coastal risks ASSUMPTION: Relevant Ministries have a vested interest to fully integrate coastal adaptation strategies into their long-term planning
	2. Creation of a national ICZM inter-ministerial platform to facilitate the coastal adaptation	2. BASELINE Although Tunisia ratified the Barcelona Integrated Coastal Zone Management (ICZM) protocol, implementation of the ICZM in terms of actions has been slow. Currently, the regional MedPartnership programme is trying to integrate CC into national strategies to begin implementation of ICZM in Tunisia. However, there have been no on-the-ground implementations of ICZM. The Ministries are also not collaborating with the National Shore Protection and Planning Agency (APAL) when they are implementing coastal development activities. Tunisia therefore lacks a mechanism to coordinate projects, strategies and programmes involving the coastal zone on the national and regional levels. (Other regional level ICZM initiatives in the Mediterranean include the Global Water Partnership, PEGASO and UNESO-	2. TARGET: Creation of a national ICZM inter-ministerial platform to coordinate projects, strategies and programmes involving the coastal zone on the national and regional levels and to facilitate decision-making on sustainable and climate resilient coastal development	2. Review on the coordination of agencies conducting ICZM projects/programmes	

	3.Number of risk-based spatial management plans used by the Municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis	IHP.) 3. BASELINE Through the local Agenda 21 approach already applied in Tunisia, community informed sustainable planning is possible. However, a renewed local Agenda 21 which considers up to date coastal risks (erosion, SLR, flooding) is lacking in both sites of the project. Stakeholders have not been consulted about the current potential coastal risks in their region because there is no available risk planning tool to facilitate the application of options for ICZM and to develop site specific design criteria for sustainable development including appropriate adaptation strategies and flexible pathways.	3. TARGET: 1 risk-based spatial management plan developed for the Municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis detailing prioritized, cost-effective ICZM and adaptation strategies / flexible pathways, targeting the agricultural sector (northwest coast of the Gulf of Tunis site) and the tourism sector (Djerba)	3. Land management plan updates (Local Agenda 21) for the municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis	
Outcome 2 Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 22 km of coast and 670 hectares of wetland and benefiting 150,000 inhabitants	1. Number of soft adaptation measures implemented which improve coastal conditions by increasing resilience to absorb change as measured by the following: • Length of coast preserving public open space and natural ecosystems • Area of wetlands with improved	1. BASELINE: Existing baseline actions and projects, such as under APAL's National Coastal Erosion Protection Programme, the ICZM project, and the KFW project consist mainly of reactive, end-of-pipeline solutions such as artificial sand nourishment and 'hard' protection measures (e.g., shore embankment, breakwater construction). Although the MedWetCoast project offered encouraging sand dune rehabilitation results, rehabilitation solutions are not cost-effective because required materials must be imported. Similarly, APAL's experience with the installation of geotextile tubes in the El Mezraya zone indicated that materials are too fragile.	1. TARGET: • Djerba: Length preserving 10 km of coast public open space and natural ecosystems • Both sites: 670 hectares of wetlands with improved ecological conditions • Both sites: 20 Km of successful dune fixation • Ghar El Melh: 2 kilometres of living	1. Design and construction logs housed at APAL; National Tourism Board and Ministry of Agriculture records on the use of recycled water in hotels and on agricultural land in Djerba and in the Northwest of the Gulf of Tunis	ASSUMPTION: Initial coastal vulnerability studies and technical assessments are accurate in their predictions of coastal impacts RISK: Works associated with coastal protection lead to unanticipated environmental impacts (e.g., eutrophication)

	ecological conditions • Length of coast with stable dune fixation • Number of kilometers of living shorelines implemented • Percentage increase in hotels and agricultural land which use recycled water	Presently, 5 soft coastal protection and water management measures have been implemented in Djerba Ganivelles, dune stabilisation with native grasses, geotextile tubes, wind-breaking fences, water recycling and purification practices in some hotels)	shorelines implemented • 5% increase in hotels and agricultural land which use recycled water		
	2. Establishment of a Monitoring and Evaluation (M&E) database with qualitative and quantitative indicators of soft coastal adaptation measures which contributes to the central coastal databank (SIAD)	2. BASELINE: No M&E system exists for adaptive coastal management: In spite of 13 years' experience with coastal preservation projects, the National Shore Protection and Planning Agency (APAL) lacks technical and operational capacity to measure adaptation in accordance with ICZM. Coastal developments have been evaluated based on photographs and not any quantifiable indicators that dictate long-term success. Also, APAL's developments themselves have been along limited reaches of coast, not accounting for interactions with the surrounding watershed and ecosystems.	2. TARGET: Establishment of a M&E database with qualitative and quantitative indicators of soft coastal adaptation measures which contributes to the central coastal databank (SIAD)	2. Observation/monitoring logs Annual M&E surveys; Project mid-term and terminal evaluations.	

	3.Number of tide gauges and buoys installed to support coastal risk monitoring	3.In response to direct and indirect impacts from extreme weather conditions, the government has put an early warning system high on its agenda. Along the coast, alerts are planned to be used for seismic disturbances (tsunamis), flooding, coastal surges, strong winds and marrobbios[48]. As a first step towards improved observation and forecasting capacity, the Ministry of Agriculture and Environment with support from the GIZ Climate Change Assistance Programme, developed a concept plan for a national climate change multi-hazard monitoring and early warning system. Some initiatives such as the Environment Energy Programme (PEE) and the Africa Adaptation Programme (AAP) (described in Section A.7) have provided coastal monitoring equipment to support alert generation. In spite of some point locations for observation and monitoring, the alerts and products from the regional center are not downscaled to suit Tunisia and updated by Tunisia specific observations. 3. BASELINE: 4 buoys and 2 tide gauges procured and installed through the AAP project. 4 buoys procured and installed through the PEE project.	3. TARGET: Three (3) tide gauge and 1 buoy to be procured and installed.	3. Review of APAL's procurements for coastal monitoring	
Outcome 3	1. Publication of	Tunisia's 2008 SNC Coastal study	1.TARGET Publication of	1.Financing plan at the	ASSUMPTION:

[48] Waves caused by rapid and unusual changes in atmospheric pressure in confined areas

Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven coastal adaptation measures	long-term financing strategies to guide APAL in how to mobilize funds for coastal adaptation	indicated that the total cost of adapting to a 0.5 meter SLR is approximately US$1 billion. The Government of Tunisia currently has no financial mechanisms to cover the costs of SLR and erosion. Moreover, due to the difficulty in demonstrating cost-effective climate compatible measures to reduce water stress and impacts on coastal settlements, the Government does not have the knowledge on how to properly attract public and private financial mechanisms to support long-term coastal needs. 1. BASELINE: No strategies which provide guidance on how to mobilise funds for coastal adaptation	at least 1 long-term financing strategy to guide APAL in how to mobilize funds for coastal adaptation	ministry level (Ministry of Equipment, Land Planning and Sustainable Development) earmarked for coastal adaptation	Institutions working in coastal adaptation have sufficient capacity and incentive to mobilise and manage funds and new economic instruments for coastal adaptation RISK: Insurance companies are not willing and incentivized to study the feasibility of adapting disaster risk insurance
	2. Percentage of APAL's budget provided to community members (including NGOs/CSOs) so that they can finance community-based coastal adaptation measures	2. BASELINE: Community-run coastal adaptation projects (with the support of local NGOs/CSOs) have had much success in Tunisia. During the Africa Adaptation Project (AAP) 7 NGOs developed Adaptation Action Plans with the goal of promoting climate change awareness. In spite of the solid collaboration between APAL and NGOs/CSOs, investment mechanisms to support community-based adaptation are limited in Tunisia. Consequently, there are no financial mechanisms to support sustainability of coastal adaptation activities in the long-term. NGO/CSO engagement in coastal rehabilitation is hindered by their lack of financial resources.	2. TARGET 2% of APAL's budget supports community members or members of NGOs/CSOs to implement small adaptation projects (e.g., nursery development, sand dune fixation, etc.)	2. Funds available to NGOs/CSOs for coastal adaptation	RISK: NGOs/CSOs do not have sufficient financial literacy to manage small revolving fund or micro-grants for small-scale coastal adaptation projects

4 TOTAL BUDGET AND WORKPLAN

Award ID:	00079688	Project ID(s):	00089624
Award Title:	Coastal areas of Tunisia		
Business Unit:	TUN10		
Project Title:	Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia		
PIMS no.	4697		
Implementing Partner (Executing Agency)	Coastal Protection and Planning Agency (APAL)		

SOF (e.g. GEF) Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Yr5 (USD)	Total (USD)	See Budget Notes:
OUTCOME 1: Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved	**APAL**	**62180**	**SCCF**	71200	International Expert	0	19,000	19,000	0	0	38,000	a
				71400	Contractual Services - Individ	23,000	26,800	36,800	88,000	88,000	262,600	b
				72200	Equipment and Furniture	30,000	0	0	0	0	30,000	c
				74100	Professional Services	47,000	12,000	12,000	37,000	47,000	155,000	d
				75700	Training, Workshops & Conferences	34,880	34,880	34,880	34,880	34,880	174,400	e
					sub-total SCCF	**134,880**	**92,680**	**102,680**	**159,880**	**169,880**	**660,000**	
					Total Outcome 1	**134,880**	**92,680**	**102,680**	**159,880**	**169,880**	**660,000**	
OUTCOME 2: Climate change resilience of	**APAL**	**62180**	**SCCF**	71200	International Expert	108,000	108,000	108,000	108,000	108,000	540,000	f
				71300	National Expert	13,200	13,200	13,200	13,200	13,200	66,000	g

priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 40 km of coast and benefiting 150,000 inhabitants				71400	Contractual Services - Individ	161,750	336,440	78,940	90,820	81,440	749,390	h
				72200	Equipment and Furniture	0	30,000	30,000	0	0	60,000	i
				73400	Rental & Maint of Equip	47,490	52,170	47,480	47,350	47,210	241,700	j
				74100	Professional Services	35,010	620,340	740,010	567,510	305,000	2,267,870	k
				75700	Training, Workshops & Conferences	0	18,760	18,760	18,760	18,760	75,040	l
					sub-total SCCF	**365,450**	**1,178,910**	**1,036,390**	**845,640**	**573,610**	**4,000,000**	
					Total Outcome 2	**365,450**	**1,178,910**	**1,036,390**	**845,640**	**573,610**	**4,000,000**	
OUTCOME 3: Innovative and sustainable economic instruments established to accelerate country-wide adoption and up scaling of proven costal adaptation measures		**62180**	**SCCF**	71200	International Expert	19,000	19,000	19,000	19,000	19,000	95,000	m
				71400	Contractual Services - Individ	33,400	72,900	77,900	65,400	53,400	303,000	n
				75700	Training, Workshops & Conferences	21,000	66,000	60,000	25,000	20,000	192,000	o
					sub-total SCCF	**73,400**	**157,900**	**156,900**	**109,400**	**92,400**	**590,000**	
		40000	**UNDP**	72400	Grant	20,000	20,000	20,000	20,000	20,000	100,000	p
		30071	**GEI**	72400	Grant		15,000	15,000			30,000	q
					Grant sub-total	**20,000**	**35,000**	**35,000**	**20,000**	**20,000**	**130,000**	
					Total Outcome 3	**93,400**	**192,900**	**191,900**	**129,400**	**112,400**	**720,000**	
PROJECT MANAGEMENT UNIT	**APAL**	**62180**	**SCCF**	71400	Contractual Services - - Individ	17,700	17,700	17,700	17,700	17,700	88,500	r
				71600	Travel	8,800	8,800	8,800	8,800	8,800	44,000	s
				72500	Supplies	5,000	5,000	5,000	5,000	5,000	25,000	t

				74599	UNDP Cost Recovery Charges	18,500	18,500	18,500	18,500	18,500	92,500	u
					sub-total	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**250,000**	
					Total Management	**50,000**	**50,000**	**50,000**	**50,000**	**50,000**	**250,000**	
					PROJECT TOTAL	**643,730***	**1,514,490**	**1,380,970**	**1,184,920**	**905,890**	**5,630,000**	

*Note: The first year is considered a "launching" year for the SCCF financed project. The Management Unit, TORs, and the national ICZM inter-ministerial platform will be established/launched. The more costly investments in coastal adaptation for Component 2 will begin in year 2 after the risk assessments and planning are completed.

Summary of Funds:[49]

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Amount Year 5	Total
APAL, National Coastal Protection Programme and grants from KFW	11,160,000	11,160,000	11,160,000	11,160,000	11,160,000	**55,800,000**
APAL, Saudi Fund for Development	3,600,000	3,600,000	3,600,000	3,600,000	3,600,000	**18,000,000**
UNDP TRAC	20,000	20,000	20,000	20,000	20,000	**100,000**
Green Economy Initiative		15,000	15,000			**30,000**
GEF	623,730	1,479,490	1,345,970	1,164,920	885,890	**5,500,000**
TOTAL	**15,403,730**	**16,274,490**	**16,140,970**	**15,944,920**	**15,665,890**	**79,430,000**

Budget Note	**Description of cost item (Activity and Output number)**
a. *	- International expert to assist with development of simulations demonstrating the risks linked to climate change (CC) on infrastructure, economies and livelihoods based on a range of CC scenarios
b.	- Consulting services to develop best coastal management practice guidelines to feed cross-sectoral strategies - Consulting services to identify vulnerable areas in relation to SLR for future development - Consulting services to develop a guidance package for national, local authorities and tourism sector representatives on coastal risk mitigation options - Consulting services to develop 1 risk-based spatial management plan detailing prioritized, cost-effective ICZM and adaptation strategies / flexible pathways for each project zone - Communications Officer (25%) and Monitoring and Evaluation

[49] *Summary table should include all financing of all kinds: GEF financing, cofinancing, cash, in-kind, etc...*

c.	- Hydrological software for simulation of floods and coastal surge (MIKE 11) and SEDSIM and Fortran to model sediment processes
d.	- Revisions to the Maritime Public Domain (DPM) regulation - Revisions to the Code of Planning and Urban Development (CATU) - Revisions to Tunisia's Environmental Impact Assessment law - Integration of SLR and coastal impacts in the new Environment Code - Support for the national ICZM inter-ministerial platform to coordinate projects - Development of a field analysis plan and oceanographic indicators - Development of a detailed 5 year Action Plan for improved operation of the SIAD - Updates to the Agenda 21 local sustainable development plans for the Northwest area of the Gulf of Tunis (Kalat El Andalous and Ghar El Melah) and Jerba
e.	- Reinforcement of planning capacity at the national and sub-national level on the economics of adaptation - Strengthening and development of the Information System for Decision Aid (SIAD)
f.*	- Strengthening the technical capacity of the APAL with targeted one-time technical assistance through the mobilization of external expertise (1 international) - • Physical Oceanography - Strengthening the technical capacity of the APAL with targeted one-time technical assistance through the mobilization of external expertise (1 international) -• Database management - Strengthening the technical capacity of the APAL with targeted one-time technical assistance through the mobilization of external expertise (1 international) -• Maintenance
g.**	- Strengthening the technical capacity of the APAL with targeted one-time technical assistance through the mobilization of external expertise (national and international) -• Budgeting - Strengthening the technical capacity of the APAL with targeted one-time technical assistance through the mobilization of external expertise (2 national) -• Maintenance
h.	- Study on erosion and flooding risks for different scenarios and time horizons - Site specific feasibility study to inform activity design criteria and act as a baseline for a timed, prioritised adaptation plan for the beaches of Sidi Yati 1 & 2 and the Rass Errmal spit - Risk assessment to establish the erosion and inundation hazard at multiple scenarios and timeframes and determine the consequence and likelihood of this hazard - Site specific feasibility study to inform activity design criteria and act as a baseline for a timed, prioritised adaptation plan for the beaches of Sidi Ali El Mekki , Ghar El Melh and Kalat El Andalous (NW) - Evaluating the state of local water resources of the two project zones - Documenting and enhancing water recycling and desalination practices by hotels in Djerba - Evaluation the potential for irrigation by non- conventional water (e.g., treated wastewater and desalinated seawater) - Implementation of regular, technical capacity reinforcement, prioritized according to the needs of the technical personnel - Practical knowledge exchange and transfer of technological skills (e.g., study tours) - Monitoring, servicing and maintenance of network devices for oceanographic monitoring (buoys and tide gauges) - Development of a refined and specific vulnerability map for the project area, linked to the extreme projected conditions of SLR - Strengthening the forecasting database on extreme conditions by acquiring three (3) tide gauge and one (1) buoy - Design of an urgent intervention plan to prevent and mitigate impacts from urban flooding and flooding induced by SLR, including a pilot test

	- Environmental Impact Assessment according to Tunisia law (Law 115 of 30/11/1992 and Law 2001-14 of 30/01/2001 and Decree No:91-362)
i.	- Equipment to assist with generation of the vulnerability map
j.	- Servicing and maintenance equipment for oceanographic monitoring (buoys and tide gauges) - Equipment for a standard communication protocol from the National Guard to the level of coastal communities to communicate oceanographic forecast - Integration of resources and information available at the relevant institutions - Collaboration with INM to develop bulletins for storm forecasting with sufficient lead time that include recommendations for mitigation measures
k.	- Protection and rehabilitation of the lower beach along the coast by establishing partnerships with private hotel operators to use of posidonia - Stabilisation of the lower beach face by artificial perching, slope adjustment and sediment (Sidi Yati 1) - Rehabilitation of the back beach area and building of a low artificial dune ridge (Sidi Yati 1) - Ongoing management of the dune buffer and monitoring and evaluation of the effectiveness of implemented measures (Sidi Yati 1) - Reinforcement of back beach area with sand fencing and rehabilitation of transverse dune system using locally available posedonia, sand augmentation and planting (Sidi Yati 2) - Ue of intermittent sand fences (hessian and potentially date palm) spaced to allow through flow of sediment and encourage sand deposition (Sidi Yati 2) - Ongoing management of the public beach to allow rehabilitation of the dune area (Sidi Yati 2) - Regular beach width measurements and dune condition assessment to allow adaptive management of back beach area in particular (Sidi Yati 2) - Ganivelles north of Raddisson – with revised spacing, density and height to optimise sand capture (1km) (Ras Errmal) - Sand fences (hessian and date palm) – approximately 1 km (Ras Errmal) - Dune rehabilitation and conservation – planting, seagrass building and sand burial prior to storm season - approx. 2km (Ras Errmal) - Hydraulic wooden piles at the back beach to maintain barrier integrity while encouraging through flow of sediment towards terminal end of spit to retain current function (Ras Errmal) - Implement activity to improve management of the Ras Errmal spit in accordance with the feasibility study of Activity 2.1.1 (Ras Errmal) - Redevelopment access along the lido Sidi Ali El Mekki in view of enhancing its stability (according to feasibility study) (NW) - Redevelopment of backshore depressions Sidi Ali El Mekki (in feasibility study) (NW) - Use ganivelles(approx. 2km), sand fences, brushing (intermitted) to encourage sediment build up at back beach to build steepness of barrier(NW) - Widen the culverts along the causeway to the south to improve flushing of the inner lagoon (NW) - Ongoing management of the public beach to allow rehabilitation of the dune area and assist in resilience building - signage, pathway through from the adjacent road to the & placement of rubbish bins (NW) - Apply living shoreline techniques from the old harbour to the Sidi Ali El Mekki to the rehabilitate the degraded marshland adjacent to the coastal road – 2 km (NW) - Support for the fight against saltwater intrusion induced by SLR in the northwest zone of the Gulf of Tunis by spreading drained freshwater from irrigated agricultural plots

	- Monitoring of the salt content in aquifers as well as the aquifer yield to provide data on intrusion and to determine best aquifer management practices
l.	- Strengthening the capacity of the staff of the three municipalities of 1) Jerba, 2) Kalat el and 3) Ghar El Melh as well as local NGOs in the design, installation and tracking of resilience building projects - Creation of a network of NGOs in Djerba and the northwest area of the Gulf of Tunis in order to empower them with capacity building so that they can design and build coastal resilience projects
m.*	- International expert to support development of an Environmental Fund Management System by the National ICZM Platform to create a synergy among existing environmentally-related funds so as to enhance their collective power to mobilize funds
n.	- Knowledge sharing with international tourism operators on cost-effective best practices for coastal adaptation and coastal erosion risk management - Study by the National ICZM Platform (see Activity 1.1.6) to identify a mix of financing sources and appropriate fund channeling mechanisms for coastal adaptation - Development of required governing mechanisms and conditions of access for all coastal adaptation financing schemes - Capacity reinforcement through 2 weekly training sessions for banking and insurance institutions on options and cost-effective measures for coastal adaptation on property insurance as a means to spread coastal risks - Feasibility study on introducing disaster risk and catastrophe property insurance (for coastal flooding and stormswhich accounts for natural risks), including the use of re-insurance to transfer risk to the international market and how complementary insurance/micro-insurance credit packages - Communications Officer (25%) and Monitoring and Evaluation
o.	- Workshops to help establish joint grants to support communities, NGOs/CSOs to assist with small coastal adaptation project implementation with a particular emphasis on shared management - Development of community-run nurseries to cultivate local vegetative species for the private sector to supportfor dune fixation - Financial management and literacy training for NGOs and community members who partake in coastal adaptation project implementation - Partnership with the Green Economy Initiative to do a market study on “green employment”
p.	- UNDP TRAC fund grant
q	- Green Economy Initiative grant to do market study on palmivelle
r	- Support for the Project Management Unit, including a Project Coordinator and a Finance/Admin Assistant
s	- Field validation support (transport, mobile phone, etc.)
t.	- Supplies for Project Management Unit (furniture, hardware, etc.)
u.	- UNDP Cost Recovery charges to assist the Implementing Partner with procurement of goods and services, IT support, travel administration and the payment process (See Annex 3 for the Letter of Agreement between UNDP and the Implementing Partner)

* Assuming international expert fee: $800 flight/visas, hotel $100, daily expenses $100 and salary $500 per day

** Assuming national expert fee: $300 per day

No.	Component	Type of Expert	Role	Days Required	Fee (USD)

1	1	International	Environmental Economist	50	38,000
2	2	International	Oceanography Expert	300	228,000
2	2	International	Information Systems Management	300	228,000
3	2	National	Budgeting and financial management	20	30,000
4	2	International	Lead technician for oceanographic monitoring equipment	60	84,000
5	2	National	2 National technicians	60	36,000
6	3	International	Finance Mobilisation	125	95,000
No.	**Component**	**PM**	**Project Management Role**	**Monthly Salary (USD)**	**Project Total (USD)**
7	All	National	Admin/Finance	1100	66,000
8	All	National	Project Coordinator	2500	150,000
9	All	National	Technical Steering Committee (monthly meeting)	500	30,000
10	All	National	Monitoring and Evaluations Officer (50%)	2500	75,000
11	All	National	Communications Officer (25%)	2500	50,000

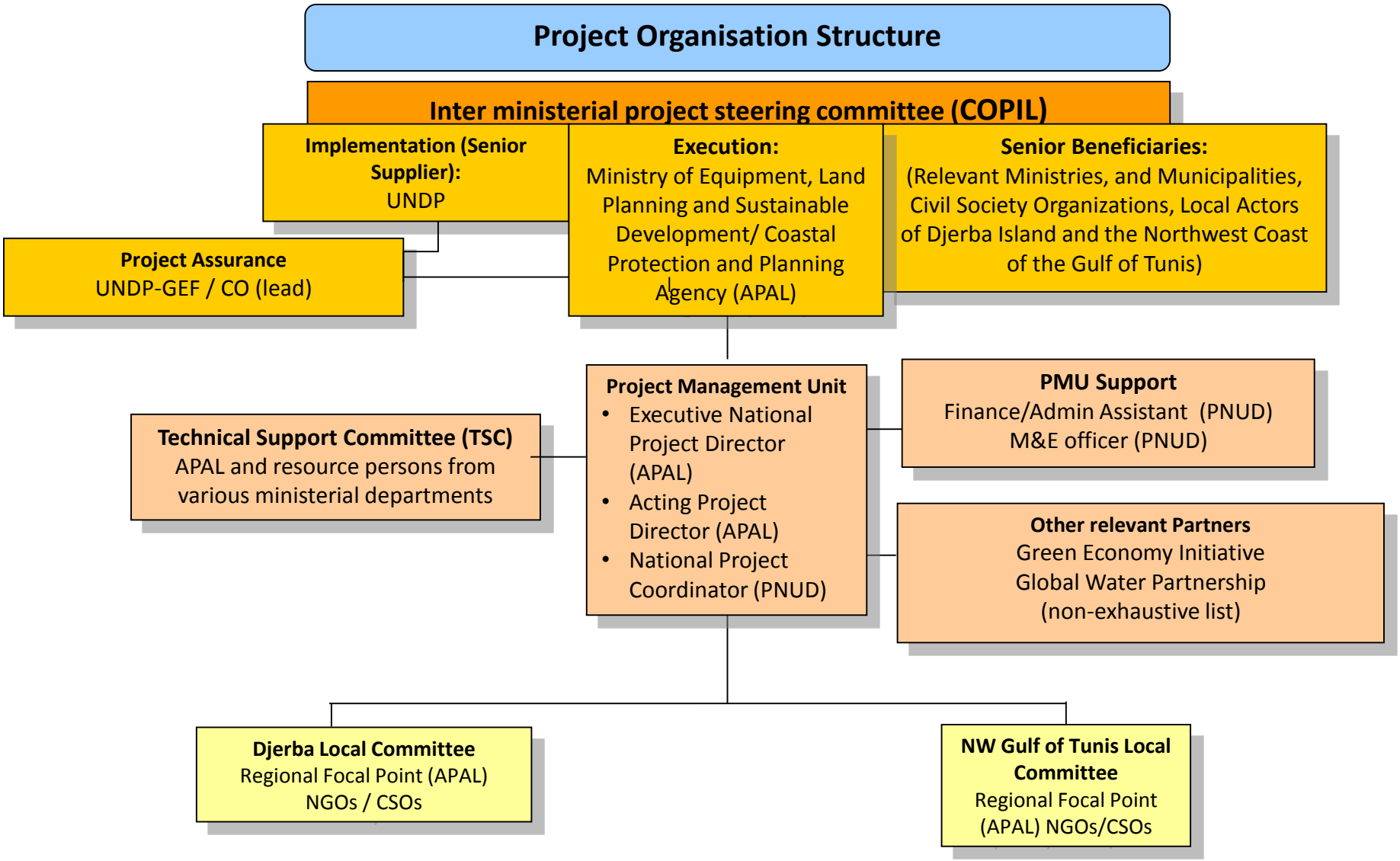
5 MANAGEMENT ARRANGEMENTS

225. The execution modality for this project will be UNDP's National Implementation Modality. The Implementing Partner (IP) for this project will the Coastal Protection and Planning Agency (Agence de Protection et d'Amenagement du Littoral, APAL) who will have project ownership and will appoint a National Project Director (NPD) and Project Coordinator (PC). The PC will be paid for by the project to coordinate project operations on a day to day basis. The main beneficiaries of this project will be the Ministry of Equipment, Land planning and Sustainable Development , APAL and its regional branches and National Coastal Observatory, the Municipalities of Houmet Essouk in Djerba and Sidi Ali Mekki in the northwest of the Gulf of Tunis and the local NGOs/CSOs. The Project Board, led by the APAL, will be responsible for orienting the strategies of project implementation and making management decisions on the project activities. Based on the approved activities, the Project Management Unit (PMU) will ensure the provision of funds to all institutions/organizations for their respective activities. All executing agencies will be responsible for managing tasks related to their institution/organization. For more details on the role of the Project Board and the members of the Project Management Unit, see Annex 4, Terms of Reference.

226. A Memorandum of Understanding and Terms of Reference (TOR) indicating the role of each executing agency will be developed under the guidance of PMU during project implementation. The UNDP CO will provide specific support services for proper project implementation, as required, through its Administrative, Programme and Finance Units and through support from the UNDP Regional Centre. A Letter of Agreement (Annex 3) describes all additional services required of UNDP beyond its role in oversight between the IP and UNDP. The direct project costs requested of UNDP are also detailed in the Total Budget Work Plan (TBWP, Section 4).

227. The Stakeholder Involvement Table indicating the key inputs of all project partners during project implementation is indicated in Table 2.

228. A diagram detailing the Management Arrangements, including the responsible decentralized agencies and support committees/organizations, is presented below. The roles and responsibilities of the parties involved in managing the project are described below.


Project Organisation Structure
Inter ministerial project steering committee (COPIL)
Implementation (Senior Supplier):
UNDP
Execution:
Ministry of Equipment, Land Planning and Sustainable Development/ Coastal Protection and Planning Agency (APAL)
Senior Beneficiaries:
(Relevant Ministries, and Municipalities, Civil Society Organizations, Local Actors of Djerba Island and the Northwest Coast of the Gulf of Tunis)
Project Assurance
UNDP-GEF / CO (lead)
Project Management Unit
• Executive National Project Director (APAL)
• Acting Project Director (APAL)
• National Project Coordinator (PNUD)
PMU Support
Finance/Admin Assistant (PNUD)
M&E officer (PNUD)
Technical Support Committee (TSC)
APAL and resource persons from various ministerial departments
Other relevant Partners
Green Economy Initiative
Global Water Partnership
(non-exhaustive list)
Djerba Local Committee
Regional Focal Point (APAL)
NGOs / CSOs
NW Gulf of Tunis Local Committee
Regional Focal Point (APAL) NGOs/CSOs

229. The **Project Board** established by a ministerial order will be directed by APAL and will be responsible for approving reports and activities. It will also provide guidance for proper implementation of the project. Members of the Project Board will include UNDP, representatives from the list indicated in TOR A, Annex 4. The PB plays a critical role in project monitoring and evaluations by quality assuring processes and products and using evaluations for performance improvement, accountability and learning. The PB also ensures that required resources are committed, arbitrates on any conflicts within the project and negotiates solutions to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the PB can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans. The Project Board will be housed within APAL and chaired by the APAL. The PB will convene bi-annually to discuss project progress and approve annual work plans. Potential members of the Project Board are reviewed and agreed upon during the PAC meeting. Other relevant stakeholders can be included in the PB if it they are judged by the Board to be essential for improving project implementation. The Project Board contains four distinct roles which have been filled as follows:

1) **An Executive**: individual representing the project ownership to chair the group.

- Ministry of Equipment, Land Planning and Sustainable Development, Coastal Protection and Planning Agency (APAL)

2) **Senior Supplier**: group representing the interests of the parties concerned which provide funding for specific cost sharing projects and/or technical expertise to the project. The Senior Supplier's primary function within the Project Board is to provide guidance regarding the technical feasibility of the project and alignment of the outcomes/outputs with the SCCF.

- UNDP

3) **Senior Beneficiary**: group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Project Board is to ensure the realization of project results from the perspective of project beneficiaries.

- Relevant Ministries as well as Municipalities, Civil Society Organizations and Local Actors of Djerba Island and the Northwest Coast of the Gulf of Tunis. Other beneficiaries can be determined during the Inception Workshop.

4) The **Project Assurance** role supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions in line with UNDP and GEF/SCCF policies and procedures.

- UNDP Tunisia Programme Officer and UNDP-GEF

230. **Project Coordinator (PC)**: The Project Coordinator has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Board. The Project Coordinator's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The PC is accountable to the UNDP, the IP and the Project Board for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. He/she will also be responsible for coordinating budgets and work plans with the relevant ministries and the Technical Support Committee. The Project Coordinator is assisted by a National Project Director, a Financial/Administrative Assistant and a specialist in Monitoring and Evaluation.

231. **National Project Director**: A representative from APAL will act as the Executive National Project Coordinator (ENPC). He/she will report to the PB and will maintain a liaison with UNDP at 20 percent. An Acting Project Director (APD) will be nominated by APAL to represent and support the ENPD. He/she i) will be responsible for day to day management of activities, ii) will support the PC and iii) will provide overall administration of the project. He will be engaged at 80 percent to assist the

ENPD. APAL will be responsible for appointing the Executive National Project Director (ENPD) and the Acting Project Director (APD). More details of the NPD position are indicated in Annex 4.

232. **Monitoring and Evaluation (M&E) Officer** (half-time): The M&E Officer will be recruited by UNDP and will report to the NPD and UNDP programme analyst. S/he will support the NPD, PC and the project task teams to prepare the relevant M&E systems required to monitor and assess quality of progress, to identify, collect, analyze, document and disseminate lessons learned through an annual project meeting, and support the preparation of project evidence for sharing through the UNDP Adaptation Learning Mechanism (ALM). The M&E Officer will liaise with the PC to prepare data collection protocols to enable the task teams to consistently collect data on project progress from project sites and its processing by the NPD for national reporting purposes.

233. **Finance / Administrative Assistant**: The project support role provides project administration, management, financial and technical support to the Project Coordinator as required by the needs of the project or individual activities. He/she will work closely with the UNDP Country Office (CO) on financial management issues relevant to project implementation. In order to ensure the Assistant has sufficient capacity to conduct financial management tasks, he/she will be trained by the UNDP CO.

234. **Technical Steering Committee:** A Technical Steering Committee will be formed to support the Project Management Unit. They will meet monthly with the PC to provide technical advice. They will equally support the PC with the management of the project for the institutions/agencies they represent The TSC will be composed of focal points from the following departments:

- Coastal management and planning
- Data collection
- Coastal erosion
- Any other relevant APAL department/unit

235. **Local Committees**: Focal points from APAL's regional branches in the Djerba and Northwest coast of the Gulf of Tunis will be responsible for facilitating coastal adaptation actions on the ground. They will work with the local NGOs/CSOs in project implementation. APAL's regional focal points are required to regularly communicate with the Project Coordinator and to provide any monitoring information to the Monitoring and Evaluation expert.

236. The project will also facilitate coordination and/or partnerships with the Green Environment Initiative and the Global Water Partnership.

6 MONITORING FRAMEWORK AND EVALUATION

The project will be monitored through the following M&E activities. The M&E budget is provided in the table below. The M&E framework set out in the Project Results Framework in Part III of this project document is aligned with the AMAT and UNDP M&E frameworks.

Project start: A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and program advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The **Inception Workshop** should address a number of key issues including:

- Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and Regional Coordinating Unit (RCU) staff (i.e. UNDP-GEF Regional Technical Advisor) vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
- Based on the project results framework and the SCCF related AMAT set out in the Project Results Framework in Section III of this project document, and finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- Plan and schedule Steering Committee meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Steering Committee meeting should be held within the first 12 months following the inception workshop.

An **Inception Workshop report** is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS.

  Risks become critical when the impact and probability are high. Note that for UNDP/GEF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs will be used to monitor issues, lessons learned. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually: Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual).
- Lesson learned/good practice.
- AWP and other expenditure reports
- Risk and adaptive management
- ATLAS QPR

Periodic Monitoring through site visits: UNDP CO and the UNDP-GEF region-based staff will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle: The project will undergo an independent Mid-Term Review at the mid-point of project implementation (expected to be in February 2017). The Mid-Term Review will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term review will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term review will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit (RCU) and UNDP-GEF. The LDFC/SCCF AMAT as set out in the Project Results Framework in Section III of this project document) will also be completed during the mid-term evaluation cycle.

End of Project: An independent Terminal Evaluation will take place three months prior to the final PB meeting and will be undertaken in accordance with UNDP-GEF guidance. The terminal evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term review, if any such correction took place). The terminal evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The LDFC/SCCF AMAT as set out in the Project Results Framework in Section III of this project document) will also be completed during the terminal evaluation cycle. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response, which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

Learning and knowledge sharing: Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

There will be a two-way flow of information between this project and other projects of a similar focus.

Audit: This project will be audited in accordance with UNDP Financial Regulations and Rules and applicable audit policies.

Table 9: Project Monitoring and Evaluation Work Plan and Budget

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	▪ Project Manager ▪ PIU (Project Implementation Unit) ▪ UNDP CO, UNDP GEF	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members. ▪ PIU, esp. M&E expert	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation	▪ Oversight by Project Manager ▪ PIU, esp. M&E expert ▪ Implementation teams	To be determined as part of the Annual Work Plan's preparation. Indicative cost is 20,000	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project manager and team	None	Quarterly
Mid-term Review	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 40,000	At the mid-point of project implementation.
Terminal Evaluation	▪ Project manager ▪ PIU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 40,000	At least three months before the end of project implementation
Audit	▪ UNDP CO ▪ Project manager ▪ PIU	Indicative cost per year: 3,000 (12,000 total)	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly for UNDP CO
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 122,000 (+/- 5% of total GEF budget)	

7 LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

This project will be audited in accordance with UNDP Financial Regulations and Rules and applicable audit policies.

8 ANNEXES

Annex 1: Risk Analysis

#	Description of the risk	Potential consequence	Countermeasures / Mngt response	Type (Risk category) Environmental Financial Operational Organizational Political Regulatory Strategic Other	Probability & Impact (1-5, low to high)	Owner	Submitted updated by	Last Update	Status
1	Insufficient institutional engagement and coordination may prevent successful project delivery especially in the current transitional context, in Tunisia	Delays in project and /or an inability to implement planned activities	A strong commitment from the GoT and the political leadership of the Ministry of Equipment, Land Planning and Sustainable Development will minimize such a risk. Additionally, the project will be prepared and carried out under the oversight of the National Commission for Natural Resources, which brings together the main government institutions concerned with this project. The Commission, placed under the authority of the Prime Minister, will play a key facilitation and coordination role between sectors with the assistance of the climate change focal point. Also, the project has been designed to account for the lessons learned from UNDP AAP project including best strategies and	Organizational, Strategic	P=3 I=3				

#	Description of the risk	Potential consequence	Countermeasures / Mngt response	Type (Risk category) Environmental Financial Operational Organizational Political Regulatory Strategic Other	Probability & Impact (1-5, low to high)	Owner	Submitted updated by	Last Update	Status
			arrangements to ensure active inter-ministerial engagement throughout implementation.						
2	Resistance among key socio-economic stakeholders (i.e. tourism operators, property owners, etc.) to participating in new economic instruments for adaptation	Inability to introduce risk sharing mechanisms to regions and the country and limited ability to mobilize funds for coastal adaptation. Cost-benefit training could also prove to be ineffective.	To minimize this risk, the project will hook up with Tunisia's 'Green Economy' initiative that was launched in 2013 with a Strategy for 2016-2036 which aims *inter alia*, to support economic policy reforms and new incentive mechanisms for increasing public and private investment into the environmental sector. The project will add a coastal adaptation layer to this process and will use it as a strategic vehicle and multi-stakeholder platform to foster an active policy dialogue on the desired economic instruments. It will proceed through concerted negotiations involving the government institutions, representatives of key socio-economic groups and other key partners and will seek to reach a	Operational, Financial, Organizational	P=4 I=4				

#	Description of the risk	Potential consequence	Countermeasures / Mngt response	Type (Risk category) Environmental Financial Operational Organizational Political Regulatory Strategic Other	Probability & Impact (1-5, low to high)	Owner	Submitted updated by	Last Update	Status
			broad-based consensus on economically and socially acceptable fiscal and market-based mechanisms for coastal adaptation. Further, by making explicit the costs and benefits of early adaptation and protective actions, it will take an evidence-based approach to raise awareness of the private sector in coastal areas, especially the tourism industry players, and secure its buy in and engagement into the new financial and insurance systems, including the upgraded National Fund for the Protection of Tourism Zones. The project will also take advantage of the growing trend to evaluated the economics of adaptation (e.g., GWP-UNDP regional initiative) Insurance companies are not willing and incentivized to study the feasibility of adapting disaster risk or property insurance and do not think the hotels and property						

#	Description of the risk	Potential consequence	Countermeasures / Mngt response	Type (Risk category) Environmental Financial Operational Organizational Political Regulatory Strategic Other	Probability & Impact (1-5, low to high)	Owner	Submitted updated by	Last Update	Status
			owners are willing to engage in an insurance scheme						
3	Lack of continued Monitoring and Evaluation to document lessons learned from soft protection measure applications	Continued point interventions with no lessons learned captured and limited ability to upscale successful pilot tests	Soft technique data will be collated in a systematic manner to inform decision-making processes. Also M&E mechanisms for the new soft interventions will appraise effectiveness and interventions in a specific coastal system context to allow successful transfer and up-scaling around the country	Operational, Strategic	P=3 I=3				
4	Data sharing is hindered by lack of coordination / willingness of agencies to share data	Inability to incentivize all sectors to contribute to coastal adaptation such as with cost benefit analyses because relevant ministries will not need access to data	Data will be centralized in a newly created databank which will be used to inform the Information System for Decision Aid (SIAD). The SIAD system includes a website to enable access by other sectors in Tunisia.	Operational, Organizational	P=3 I=3				
5	Water and coastal management strategies are made ineffective by an unanticipated increase in the frequency of flood	Wasted resources and lack of motivation to upscale interventions	Management plans will take into account worst case scenarios of extreme weather and climate change to have a margin of safety for applied interventions. Also, robust equipment will be procured	Environmental	P = 2 I = 2				

#	Description of the risk	Potential consequence	Countermeasures / Mngt response	Type (Risk category) Environmental Financial Operational Organizational Political Regulatory Strategic Other	Probability & Impact (1-5, low to high)	Owner	Submitted updated by	Last Update	Status
	events, coastal surges which jeopardizes coastal protection and water conservation measures and damages coastal monitoring infrastructure		including spare parts and technical personnel will be trained to maintain equipment and any soft solutions applied.						
6	Emphasis on shared coastal management and coordination between private hotels and NGOs and/or the municipality is hindered because of self-interests and contrasting agendas	Continued unlawful and unsustainable interventions by the private sector, (mainly hotels who construct hard protection works without consideration of the impacts) due to their lack of understanding and awareness of appropriate ICZM.	Financing will be granted to a joint NGO or community group and hotel or private sector collaboration to implement coastal adaptation measures. NGOs are already motivated (ASSIDJE, etc.) and have the knowledge and ability to perform public awareness on coastal erosion. With training from APAL, the NGOs will become capable and can act as locally-sourced manpower to implement interventions for both public and private beaches. Also the Green Economy Initiative will facilitate a future PPP by supporting potential green economy / green industry with an	Operational, Strategic	P=4 I=4				

#	Description of the risk	Potential consequence	Countermeasures / Mngt response	Type (Risk category) Environmental Financial Operational Organizational Political Regulatory Strategic Other	Probability & Impact (1-5, low to high)	Owner	Submitted updated by	Last Update	Status
			initial market study on the feasibility of using locally-sourced palmivelles as a form of fencing to capture wind-driven sand. The idea is to support the community by creating jobs while developing a private industry to lead palmivelle production.						
7	NGOs/CSOs do not have sufficient financial literacy to manage funds for small-scale coastal adaptation projects	Small coastal adaptation projects are not properly implemented and public-private coordination is hindered due to lack of confidence in NGO financial management capabilities	The third component includes training for NGOs/CSOs by a national financial expert so that they can manage SCCF funds for small coastal adaptation projects. Also, one selection criterion to choose NGOs to implement coastal adaptation project will include the demonstration of a good track record in implementing and managing projects	Operational, Organizational	P = 2 I = 2				

Annex 2a: Adaptation Options Analysis

Evaluation of suitable options for Sidi Ali El Mekki

Option		Impact	Livelihood Benefits	Ecosystems Benefits	Affordability		Implementation Capacity
					Capital Costs	Maintenance \Operation Costs	
2	**Dune/barrier reconstruction**						
	Targeted ganivelles with intermittent spacing	Low	Medium	High	low	Low	high
	Dune armouring (buried structures)	Medium	Medium	Medium	Medium	Low	Low
	Overwash channel/access path infilling	Medium	Medium	HIgh	Low	Low	High
	Beach/barrier profiling	Low			Low	Low	High
3	**Beach/Dune planting**	Low	Medium	High	Low	Low	Medium
4	**Managing coastal use through the introduction or upgrading of access, fencing, barriers, signage and other management infrastructure**	Low	High	High	Low	Low	Medium[50]
5	**Application of stabilising materials to back beach and dune area – e.g. brushing, fibre matting, mulching**	Low	High	High	Low	Low	High
6	**Improved Lagoon Flushing**	Low	High	High	Medium	Low	Medium

Evaluation of suitable options for Sidi Yati 1

Option	Impact	Livelihood Benefits	Ecosystems Benefits	Affordability		Implementation Capacity
				Capital Costs	Maintenance \Operation	

[50] At this target site a key constraint in implementing effective management efforts is the existence of extensive unregulated development. This is likely to hinder local capacity to implement many of the activities that would be considered 'most effective' or 'best practice'. Therefore demonstration activities in this area must occur in conjunction with institutional support to assist local authorities to better police/enforce sustainable coastal development. The optimal solution for this area is the complete removal of all existing unregulated development along the barrier. However, it is acknowledged that this is a contentious issue and the likelihood of achieving this, or indeed the appropriateness of attempting this, in the lifetime of the SCCF financed project under discussion is questionable. That said, it will be important to take account of this wider issue in the design of site specific adaptation options during project implementation. A comprehensive, stakeholder driven risk assessment for the area is strongly recommended as a Phase 1 activity during implementation to appropriately inform an appropriate, flexible and achievable pathway for adaptation across the coastal system.

						Costs	
1	**Managed Realignment**	Low	Medium	High	High	Low	Low
2	**Dune reconstruction**						
	Artificial construction	Medium	Medium	High	Medium	Low	Medium
	Sand nourishment (to augment existing dune)	Low	Medium	High	Medium	Medium	Medium
	Dune armouring (buried structures)	Medium	Medium	High	Medium	Low	Low
3	**Beach/Dune planting**	Low	Medium	High	Low	Low	Medium
4	**Managing coastal use through the introduction or upgrading of access, fencing, barriers, signage and other management infrastructure**	Low	High	High	Low	Low	High
5	**Application of stabilising materials to back beach and dune area – e.g. brushing, fibre matting, mulching**	Low	High	High	Low	Low	High
6	**Artificial Beach Perching**[51]	Medium	Medium	Medium	High	Medium	Low

Evaluation of suitable options for Sidi Yati 2

Option		**Impact**	**Livelihood Benefits**	**Ecosystems Benefits**	**Affordability**		**Implementation Capacity**
					Capital Costs	**Maintenance \Operation Costs**	
1	**Managed Realignment**	Low	Medium	High	High	Low	Low
2	**Dune reconstruction**						
	Artificial construction[52]	Low	Medium	High	Medium	Low	Medium
	Dune armouring (buried	Medium	Medium	High	Medium	Low	Low

[51]This is potentially the best structural option for the site but decision on its application should be delayed pending outcome of site specific feasibility study

[52] It should be possible to use existing beach sand from this site – the current problem is not a lack of sediment but the inappropriate distribution of this sediment (due to population pressure and construction of coastal road and retaining wall). It is also recommended that the use of the locally available seagrass debris deposited on the lower beach face in dune building/consolidation be investigated.

	structures)						
3	**Beach/Dune planting**	Low	Medium	High	Low	Low	Medium
4	**Managing coastal use through the introduction or upgrading of access, fencing, barriers, signage and other management infrastructure**	Low	High	High	Low	Low	High
5	**Application of stabilising materials to back beach and dune area – e.g. brushing, fibre matting, mulching**	Low	High	High	Low	Low	High

Annex 2b: Net Present Value Analysis

(Net Present Value Analysis of a Hard Measure versus a Community Based Soft Measure)

Table 1 : Annual cost of a hard measure versus a community-based soft measure, both used to build 250 meters of beach

Intervention	Yearly cost DT / m	Yearly cost USD / m	Yearly cost (250 m) USD
Community-based soft solution, Beach rebuilding with posidonia and planting along banks	300	189	47250
Training workshops for community members	3500	2205	2205
On-going management, replanting and monitoring	80	50.4	12600
Hard solution, Breakwater riprap	2000	1260	315000
Note Conversion 1 DT = 0.63 USD			

Table 2: Value of loss of 250 meters of beach for one hotel

Value of beach calculation		
Indicator	**Value/Quantity**	**Source**
Ave. number of beds per hotel, Tunisia	285	Tourism Real Estate Agency, AFT, Main Tourism Indicators: http://www.aft.nat.tn/fr/tourisme_indicateurs_tunisie.php
Loss of customer satisfaction due to erosion (USD per visitor per year)	15	World Resources Institute, Coastal Capital Jamaica, 2011. http://www.macfound.org/media/article_pdfs/coastal_capital_jamaica_summary.pdf
Annual loss of revenue with significant beach erosion over 250 meters assuming 80% occupancy, 2 people per room	1,710,000	
Annual loss of income, assuming a 5% net profit margin is average for hotels world-wide	85,500	http://www.forbes.com/sites/sageworks/2014/01/05/how-u-s-hotels-are-faring/
CHECK: Total Estimated Revenue based on revenue per bed per year (USD 9,000)	2,551,585	Tourism Real Estate Agency, AFT, Main Tourism Indicators: http://www.aft.nat.tn/fr/tourisme_indicateurs_tunisie.php

Table 3: NPV comparison, hard and community-based soft measure versus cost of doing nothing (i.e., not preventing erosion)

	yr1	yr2	yr 3	yr 4	… yr 10
Sand rebuilding with posidonia (Community-based soft measure) including subsequent annual maintenance and monitoring costs	(47,250)	(12,600)	(12,600)	(12,600)	
Training cost for community members	(2,205)				
Hard measure (breakwater)	(315,000)				
Loss of revenue due to beach erosion	85,500	85,500	85,500	85,500	
Net cash flows with soft measure	36,045	72,900	72,900	72,900	72,900
Net cash flows with hard measure	(229,500)	85,500	85,500	85,500	85,500
NET PRESENT VALUE over 10 years (soft)					**564,378**
NET PRESENT VALUE over 10 years (hard)					**414,857**
All cash flows in USD and a discount rate of 10% is assumed					

Annex 3: Letters of Agreement (Cofinancing, Financing Frameworks and Direct Project Cost)

وكالة حماية و تهيئة الشريط الساحلي
AGENCE DE PROTECTION ET D'AMENAGEMENT DU LITTORAL

Tunis, 30th of June 2014

Ms. Adriana Dinu
UNDP-GEF Officer-in-charge
304 East 45th St., 9th Floor, New York, NY, 10017 USA

Subject: Co-financing for the UNDP-GEF project "Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia"

Dear Madam,

On behalf of the Coastal Planning and Protection Agency (APAL), I am pleased to express my full endorsement and support of the Global Environment Facility (GEF) project on **Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia** (2014 – 2019). The project is fully in-line with APAL's National Coastal Protection Programme and the Ministry of Equipment's (DGSAM). The following self-financed and donor supported projects will provide full support for the project by focusing on erosion protection, monitoring coastal processes and fishing port rehabilitation.

- *Development work in the coastal zone of the Monastir Bay (1st phase)* (funded by APAL, 2014-2015, USD 7.9 m);
- *Extension and rehabilitation works at the Chebba fishing port* (funded by DGSAM, 2013-2015, USD 6.4 m);
- *KFW Coastal Protection* projects, (funded by KFW, USD 31.1 m) Phase I (2013-2017 in Kerkennah Raf Raf) and Phase II (2014-2018 in Sousse Nord /Hergla Rades /Soliman); and
- Contribution of APAL to the *KFW Coastal Protection* projects*: Phase I + Phase II* (funded by APAL, USD 10.4 m)

All of the projects are being executed by APAL and DGSAM and will be used to support the GEF project so that institutional capacities for coastal management can be improved.

Combined, APAL and DGSAM's programmes will be committing USD $55.8 m in parallel grant funding that will be used to complement and support Outcome 1 (*Institutional capacity to plan for and respond to increasing climate change risks in coastal areas is improved*) and Outcome 2 (*Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 40 km of coast and benefitting 150,000 inhabitants*) of the SCCF financed project.

We thank you for your support and look forward to a fruitful collaboration in the future.

Yours Sincerely,

Signature Le Directeur Général

Stamp Mohamed [illegible]HAOUI

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وكالة حماية و تهيئة الشريط الساحلي
AGENCE DE PROTECTION ET D'AMENAGEMENT DU LITTORAL

Tunis, 07th of May 2014

Ms. Adriana Dinu
UNDP-GEF Officer-in-charge
304 East 45th St., 9th Floor, New York, NY, 10017 USA

Subject: Co-financing for the UNDP-GEF project "Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia".

Dear Madam,

This letter is to indicate that the Coastal Planning and Protection Agency (APAL) will be supporting the **Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia** (2014 – 2019) project through the support of a loan from the Saudi Fund for Development. The loan is supporting APAL in implementing coastal protection measures along the Tunisian coast from Catharge to Gammarth. Activities financed by the loan are aligned with the Special Climate Change Fund project by protecting against the adverse impacts of sediment transport and erosion.

The totality of the loan (USD 18 m) will be used to provide a grant contribution and will act as parallel funding to the current coastal protection measures financed by the Saudi Fund. The loan will be used to show support for the SCCF financed project for Outcome 2 (*Climate change resilience of priority coastal areas enhanced through implementation and dissemination of innovative risk reduction measures covering 40 km of coast and benefitting 150,000 inhabitants*).

On the part of APAL, I wish to confirm our support through this co-financing and look forward to our future collaboration.

Yours Sincerely,

Signature

Le Directeur Général
Mahmoud JUHAOUI

Stamp

A.P.A.L. AGENCE DE PROTECTION ET D'AMENAGEMENT DU LITTORAL

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UNI

Programme des Nations Unies pour le Développement

Tunis, 11/02/ 2014

Ms. Adriana Dinu
UNDP-GEF Officer-in-charge
304 East 45th St., 9th Floor, New York, NY, 10017 USA

Subject: Co-financing for the UNDP-GEF project "Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia"

It is with pleasure that I confirm UNDP Tunisia's support for the GEF project **Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia** (2014 – 2019) which was developed in close collaboration with the Tunisian Coastal Planning and Protection Agency (Agence de Protection et d'Aménagement du Littoral, APAL). The project is in-line with UNDP's work programme that targets adaptation to climate change and supports the Government of Tunisia to address its Second National Communication.

The UNDP Tunisia Country Office will be committing $100,000 cash co-financing towards this project from its TRAC funding.

We look forward to having a close collaboration with APAL to implement coastal adaptation measures on-the-ground in the Northwest coast of the Gulf of Tunis and the Island of Djerba.

Yours Sincerely,

Mr. Mounir Tabet
Resident Representative
UNDP Tunisia

Signature

Stamp

41Bis, Impasse Louis Braille 1003 Cité El Khadhra Tunis - Tél. : (216) 71 904 011 - Fax : (216) 71 900 668– E-mail : registry.tn@undp.org

REPUBLIQUE TUNISIENNE

Ministère de l'Equipement
de l'Aménagement du Territoire
et du Développement Durable

Développement Durable
DGDD/DEAEEP/GHD

.Tunis le 13 MARS

0344

Ms. Adriana Dinu
UNDP-GEF Officer-in-charge
304 East 45th St., 9th Floor, New York, NY, 10017 USA

Re: Co-financing for the UNDP-GEF project "Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia"

Dear Madam,

This letter is to confirm the support and commitment of the Green Help Desk (GHD) for the Global Environment Facility (GEF) project **Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia**. The GHD has the objective to promote "green employment" and "green industry" and has the long-term vision of finding sustainable financing to combat degradation. The GHD will provide a cash co-financing contribution of USD $30,000 to become an investment partner to determine the feasibility of the national "green industry" production of "palmivelles." Palmivelles is a unique fencing technique constructed with native palm leave materials which has demonstrated success for dune fixation in a small pilot project by APAL.

The Green Help Desk will support Component 3 of the GEF project (*Innovative and sustainable economic instruments established to accelerate country-wide adoption and up-scaling of proven coastal adaptation measures*), by analysing the feasibility and market demand of locally produced palmivelles which would be fabricated from local Djerba palm trees.

On behalf of GHD, our initiative plans to contribute to the objective of the GEF Special Climate Change Fund Project with a close collaboration during the period of 2014-2019.

Yours Sincerely,

Ministère de l'équipement
de l'aménagement de territoire
et du développement durable
Secrétaire d'état du développement durable

Mounir MAJDOUB

A STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT FOR THE PROVISION OF SUPPORT SERVICES

The Minister of Equipment, Land Planning and Sustainable Development, M. Hedi LARBI,

1. Reference is made to consultations between officials of the Government of *Tunisia* (hereinafter referred to as "the Government") and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant programme support document or project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:

(a) Identification and/or recruitment of project and programme personnel;

(b) Identification and facilitation of training activities;

(a) Procurement of goods and services;

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the programme support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the [A*ccord de base type avec le Gouvernement Tunisien sur l'assistance du PNUD - 25 avril 1987*] (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

Yours sincerely,

_____

For the Government
HE M. Hedi LARBI
Minister of Equipment, Land Planning and Sustainable Development
Tunisia

_____

Signed on behalf of UNDP
M. Mounir Tabet
Resident Representative
UNDP Tunisia

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between [*Ministry of Equipment, Land Planning and Sustainable Development – National Agency for Coastal Protection and Planning*], the institution designated by the Government of [*Tunisia*] and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed programme or project [**Addressing climate change vulnerabilities and risks in vulnerable coastal areas of Tunisia– ID 00089624**], "the Programme" [*or "the Project*"].

2. In accordance with the provisions of the letter of agreement and the programme support document [*or project document*], the UNDP country office shall provide support services for the Programme [*or Project*] as described below.

a. Recruitment of the International consultants as per the Terms of Reference annexed to the project document.
b. Assist the government in procurement of hardware and software equipment's as per the project document in terms of identifying manufacturer selection, preparation and management of procurement contracts, and purchase order assistance management, APAL will request UNDP for assistance prior to and during project implementation.
c. Contracting companies to provide professional services as required (eg coastal protection work)
d. Identify training institutions abroad and administer participation of trainees in training programmes as needed
e. Support conferences and workshops organisation.

3. Support services to be provided:

SUPPORT SERVICES	SCHEDULE FOR THE PROVISION OF THE SUPPORT SERVICES	COST TO UNDP OF PROVIDING SUCH SUPPORT SERVICES (WHERE APPROPRIATE)	AMOUNT AND METHOD OF REIMBURSEMENT OF UNDP (WHERE APPROPRIATE)
Recruitment of management unit staff as per the Terms of Reference annexed to the document. Advertisement, Identification, selection and contracting of International consultants (including advertising, short-listing and recruitment) (Payroll, TA, F10, etc…) Services related to ICT for the project unit management staff: o Email box maintenance o ICT and office equipment installation and maintenance o Internet channel use o Mobile telephone contracting and use	September 2014-December 2019	As per the Universal Price List costs: o 60 days over 50 months of HR Assistant, procurement associate, programme Analyst and Programme Assistant : $ 16,000 o 20 days over 50 months of IT Associate: $6,000	UNDP will directly charge the project upon receipt of request of services from the Implementing Partner (IP)
Services related to procurement (including but not limited to): - Procurement of goods	Throughout project implementation when applicable	As per the Universal Price List costs:	As above

(Equipment…) - Procurement of services (IC, Service contract, conferences and workshops organisation etc…) - Travel, administration (DSA, air ticket, TA etc…)		○ 200 days over 50 months of the Support Project Unit Manager, Procurement Associate, programme Analyst and Programme Assistant $ 40,000	
Services related to finance (including but not limited to): ○ Payments	On-going throughout implementation	As per the Universal Price List costs: ○ 300 days over 50 months finance assistant, finance specialist, programme assistant, programme analyst: $30,500	As above
Total		**92 500 $**	

Description of functions and responsibilities of the parties involved:

UNDP will conduct the full process while the role of the Implementing Partner (IP) will be as follows:

- The Implementing Partner will send a procurement plan related to services requested annually/ updated quarterly;
- The Implementing Partner will send the request to UNDP for the services enclosing the specifications or Terms of Reference required;
- For Hiring CV: the IP representatives will be on the interview panel, or participate in CV review in case an interview is not scheduled.

Annex 4: Terms of Reference

MANAGEMENT ARRANGEMENT OF THE PROJECT:

A. Inter-ministerial project steering committee/Project Board (PB) (COPIL)

The Project Board (PB) is responsible for orienting the strategies of project implementation and making management decisions for the project. The PB plays a critical role in project monitoring and evaluations by quality assuring processes and products and using evaluations for performance improvement, accountability and learning. The PB also ensures that required resources are committed, arbitrates on any conflicts within the project and negotiates solutions to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the PB can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

The PB shall comprise national and sub-national representatives to guide and oversee the project including. Apart from UNDP Tunisia and APAL, permanent Members include the following*:*

- Ministère des Affaires Etrangères
- Ministère du Développement et de la Coopération Internationale
- Ministère de l'Equipement et de l'Environnement
    - Secrétariat chargé de l'Environnement
    - Direction générale des services aériens et maritimes
    - Direction génrale de l'aménagement du territoire
- Ministère des Finances
- Ministère de l'Agriculture
- Observatoire Tunisien de l'Environnement et du Développement Durable
- L'Agence Nationale de Protection de l'Environnement;
- Le Ministère du Tourisme et de l'Artisanat
- l'Agence Foncière Touristique
- L'institut National de Météorologie
- Ministère de l'intérieur / département des collectivité locales
- L'Institut National des Sciences et Technologies de la Mer
- L'institut National de la cartographie et de la télédétection
- ONG
- Membres de la collectivité locale des deux zones d'intervention (Djerba et Nord Ouest du Golf de Tunis);
- Fédération des hôteliers/ L'association des opérateurs de tourisme
- Project management team

Other relevant stakeholders can be included in the PB if it they are judged by the Board to be essential for improving project implementation.

The PB will be housed within APAL and chaired by the APAL. The PB will convene bi-annually to discuss project progress and approve annual work plans. The Project Coordinator (PC) Officer will be an ex officio member of the PB responsible for taking minutes. Potential members of the Project Board are reviewed and recommended for approval during the PAC meeting.

The responsibilities of the PB will be to:

- Supervise and approve the annual work plans and short term expert requirements

- Orient the strategy of project implementation
- Supervise project results through monitoring progress and approving annual reports
- Review and approve work plans and reports
- Provide strategic advice to the implementing institutions to ensure the integration of project activities with national and sub-national sustainable development and climate resilience objectives;
- Ensure inter-agency coordination and cross-sectorial dissemination of strategic findings
- Ensure full participation of stakeholders in project activities
- Assist with organization of project reviews and contracting consultancies for technical assistance
- Provide guidance to the National Project Director

B. **Executing Agency (EA)**

The *Agence de Protection et d'Amenagement du Littoral (*APAL) is the organism in charge of protection and management of the coastal regions in Tunisia. It will be the **Executing Agency** of the project and thereby responsible for the execution of project activities. It will ensure, in close collaboration with UNDP Tunisia and the Secretary of State for Environment, the planning and management of project activities. APAL will be in charge of Annual Work Plan preparation in collaboration with UNDP Tunisia. According to the national execution procedures of UNDP, APAL will report on financial and technical aspects of the project.

The EA may open a bank account for the project and receive advances from UNDP, based on an approved annual work plan (AWP). The executing agency may also choose to request that UNDP make direct payments for certain activities. This will be determined at the beginning of each year and will be established in the AWP.

It is noteworthy to mention, that due to the comprehensive aspect of the project, various activities will be implemented in collaboration with other administrative structures, including the Institut National de Météorologie (INM), as well as regional and municipal governments in pilot sites and non-governmental partners.

C. UNDP Role:

UNDP is responsible for implementation oversight. UNDP Tunisia will give its technical support to the project team, through mobilizing national and international expertise in order to reach the expected results. The UNDP CO will ensure continuous support related to project management complying with UNDP procedures.

At the request of the executing agency, UNDP may provide a series or project implementation support services. These services include procurement of services and goods, recruitment of consultants, direct payments for suppliers or goods, etc. This support to national execution will be conducted according to UNDP procedures. A Letter of Agreement between the Government of Tunisia and UNDP Tunisia, signed by both parties, is included in the project document (Annexe 3).

If the executing agency chooses to use the direct payment modality, UNDP Tunisia will proceed to the payment of suppliers/consultants following to the action plan elaborated with the executing agency and

after receiving the direct payment (FACE : **Funding Authorization and Certification of Expenditures**) cleared by the project director.

Finally, a national project director (NPD) and an interim National project director will be nominated by the APAL further to the signature of the project document. The responsibilities of the NPD are detailed below.

D. National Project Director (NPD) (comprised of an Executive National Project Director 20% and an Acting Project Director 80%)

APAL will be responsible for appointing an Executive National Project Director (ENPD) and an Acting Project Director (APD). The ENPD will report to the Project Board and will maintain liaison with UNDP.

The APD will be nominated by APAL to represent the ENPD. He/she will be responsible for day to day management activities and overall administration of the project. He will be engaged at 80% to assist the ENPD.

The ENPD and APD will be housed within APAL. Their responsibilities will include:

- Ensuring effective partnership working with the sub-national implementing Bureaus and the participating national agencies.
- Managing human and financial resources in consultation with the NPD to achieve results in line with the outputs and activities outlined in the project document.
- Leading the preparation and implementation of annual results-based work plans and logical frameworks as endorsed by the management.
- Liaison with related and parallel activities dealing with coastal management by cooperating with their respective implementing Ministries and Bureaus.
- Monitoring project activities, including financial matters, and preparing monthly and quarterly progress reports, and organising monthly and quarterly progress reviews.
- Supporting the NPD to organise task team meetings and annual lesson learning conferences.
- Coordinating the distribution of responsibilities amongst team members and organising monitoring and tracking systems.
- Reporting and providing feedback on project strategies, activities, progress, and barriers to the PB.

E. Project Coordinator (PC)

The Project Coordinator (PC) will report to the PB and will lead the project team through the planning and delivery of the Project. The PC will be hired by the UNDP CO and will be paid for by the project. He/she will have the authority to run the project on a day-to-day basis on behalf of the Implementing Partners, within the constraints laid down by the Board. The PC's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The PC will be responsible for financial management and disbursements, with accountability to the government and UNDP. The PC will work closely with the Executive National Project Director (ENPD) and Acting Project Director (APD).

With the support of the project management unit, the PC will be responsible for:

- Day-to-day oversight and coordination of implementation of project activities.
- Recruitment and supervision of technical and training expertise as required for implementation of the project.
- Developing and maintaining close linkages with relevant sectorial government agencies, UNDP, NGOs, civil society, international organisations and implementing partners of the project.
- Coordinating the project team in carrying out their duties at an optimum level through ensuring efficient and effective resource utilization.
- Coordinating inputs into annual results-based work plans and logical frameworks as endorsed by the management.
- Preparing detailed annual breakdowns of the work plan for all project objectives. And preparation of quarterly work plans.
- Coordinating inputs into all project reports as required (including Annual Project Reports, Inception Report, Quarterly Reports and the Terminal Report).
- Preparing quarterly status and financial reports for comments and approval by the PM.
- Coordinating the establishment of sub-national project Task Teams.
- Organise annual task team meetings for experience sharing and lesson learning.
- Organise quarterly meetings with the Technical Steering Committee

F. Technical Steering Committee (TSC)

Similar to the AAP project, the APAL's internal Technical Steering Committee (TSC) will be composed of focal points from the following departments:

- Coastal management and planning
- Data collection
- Coastal erosion
- Any other relevant APAL department/unit

They will meet monthly with the PC to provide technical advice. They will equally support the PC with the management of the project for the institutions/agencies they represent.

Note:

- The focal points from APAL who will comprise the TSC will be designated by the Director General and each member will have a specific TOR in order to facilitate the coordination between the TSC members and the PC;
- The TSC can be enriched with resource persons from other ministerial departments each time it is judged necessary for specific outputs.

G. Administrative and Financial Assistant:

One administrative and financial assistant will be recruited by UNDP, will be financed by the project, will be housed at APAL and will report to the PC. His/her responsibilities will be to:

- Set up and maintain project files and accounting systems whilst ensuring compatibility with Tunisia and UNDP financial accounting procedures.
- Prepare budget revisions of the project budgets and assist in the preparation of the annual work plans.
- Process payment requests for settlement purposes
- Prepare status reports, progress reports and other financial reports.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel, experts, and consultants by preparing annual recruitment plans.
- Collect and maintain project related information data and establish document control procedures.
- Administer Project Board meetings
- Administer project revision control
- Compile, copy and distribute all project reports
- Provide support in the use of Atlas for monitoring and reporting

H. Monitoring and Evaluation Officer (50%)

The M&E officer will be recruited by UNDP and will report to the NPD and UNDP programme analyst. S/he will support the NPD, PC and the project task teams to prepare the relevant M&E systems required to monitor and assess quality of progress, to identify, collect, analyze, document and disseminate lessons learned through an annual project meeting, and support the preparation of project evidence for sharing through the UNDP Adaptation Learning Mechanism (ALM). The M&E officer will liaise with the PC to prepare data collection protocols to enable the task teams to consistently collect data on project progress from project sites and its processing by the NPD for national reporting purposes.

Responsibilities

- Establish the overall results-based M&E strategy in accordance with M&E plans outlined in the project document.
- Design a system for collecting information on project lessons to be used in annual progress meetings.
- Guide and coordinate the review of the Project Results Framework, including:
    a. Provide technical advice for the revision of performance indicators.
    b. Identify sources of data, collection methods, who collects data, how often, cost of collection and who analyses the data.
    c. Facilitate annual review of risks by PC.
- Prepare reporting formats and support the NPD to prepare the required reports. Guide project task teams in preparing their progress reports and perform quality assurance in accordance with the approved reporting formats. This includes quarterly progress reports, annual project reports, field visit reports, inception reports, and ad-hoc technical reports.
- Foster participatory planning and monitoring by advising the training institutions on content for participatory monitoring and evaluation of activities.

- Assist the NPD to collate technical reports and other documents from the project and contribute to the ALM.

Note: Office space for the 4 staff included in the Project Management Unit (Acting Project Director, Project Coordinator, Monitoring and Evaluation Officer and the Administration and Financial Assistant) at APAL is not available. The proposed project will use cash co-financing to rent a space specific to the project.

I. Communication Expert (25%)

The Communication Expert will be recruited by UNDP and will report to the NPD and UNDP programme analyst to conduct public awareness of the activities and to validate that training programmes are effective for the community members, the agriculture, tourism and insurance sectors. The Communication Expert will liaise with the M&E Officer to prepare the data collection protocols to consistently collect data on project progress from project sites and its processing by the NPC for national reporting purposes.

Responsibilities

- Ensure public awareness and understanding of coastal protection measures
- Facilitate Training of Trainer sessions
- Work with municipalities and communities on public awareness
- Consult with tourism, agriculture and insurance representatives to ensure they have an understanding and are in agreement with project outputs
- Provide support in mobilizing and organizing NGOs/CSOs and hotel representatives for the Joint Grant scheme (Component 3)
- Act as a liaison with insurance agents and hotel representatives to inform them about capacity reinforcement on property insurance
- Provide a relay of information to the National Project Director on what is successful or not working in each project zone

Qualifications Required

- Knowledge of coastal protection and adaptation
- Ability to conduct public awareness campaigns
- Proven capacity in communication on national and local levels
- Fluency in Tunisian Arabic and French

J. Local Committees

Focal points from APAL's regional branches in the Djerba and Northwest coast of the Gulf of Tunis will be responsible for facilitating coastal adaptation actions on the ground. They will work with the local NGOs/CSOs in project implementation. APAL's regional focal points are required to regularly

communicate with the Project Coordinator and to provide any monitoring information to the Monitoring and Evaluation expert.

K. Expert in Oceanographic Monitoring to provide training (International, 5 man days per month over 5 years)

Missions « Analyse et traitement des données océanographiques » axé sur le métier d'océanographie, dont l'objectif général est la mise à niveau du personnel de l'APAL dans le domaine du traitement des données océanographiques,

Profil demandée:

- Bac+4 au minimum ayant une expérience en océanographie physique
- Nombre d'années d'expérience : Au moins cinq années (05 ans)
- Nombre de références: cinq (05) travaux et/ou des études et/ou missions relatives aux contrôles de données, traitements, gestions et interprétations des données océanographiques
- -Durée de l'intervention : 15 hommes jours/mois durant cinq ans

L. Expert in Information Management Systems to provide training (International, 5 man days per month over 5 years)

Missions « Gestion du Système d'information » « Un informaticien, gestionnaire de base de données et S.I ». Son role sera de renforcer les capacités de l'APAL et contribuer avec l'équipe de l'observatoire en matière de gestion des métadonnées et des données océanographiques intégrant le contrôle qualité et le stockage.

Profil demandée:

- Un informaticien, ayant bac+4 au minimum
- Nombre d'années d'expérience : Au moins cinq années (05 ans)
- Nombre de références: cinq (05) études et/programmes et/ou missions relatives au développement, la gestion, des bases de données et/ou des systèmes d'information, les métadonnées.
- -Durée de l'intervention : 10 hommes jours/mois durant cinq ans

M. Oceanographic Network Maintenance Team, 1 International technician and 2 National technicians (1 day per month over 5 years)

Missions: Maintenance du réseau de mesure océanographique de l'APAL : « Technicien en (Instrumentation et télétransmission) et deux plongeurs.

L'équipe doit comporter au moins les profils suivants :

- Bac+2 au minimum ayant une expérience concernant les instruments de mesure dotés des équipements de télétransmission (Instrumentation et télétransmission).
- Nombre d'années d'expérience : au moins deux années (02 ans)
- Nombre de références: ayant déployé et/ou exploité et/ou entretenir au moins une fois des instruments de mesure en mer (bouée et/ou courantomètre et/ou ADCP et/ou des capteurs physico-chimiques) et/ou participation au minimum à deux (02) contrats de maintenance des instruments dotés des équipements de mesure et de télétransmission.

Profils des deux (02) plongeurs qualifiés et certifiés.

- Au minimum une année d'expérience chacun
- Une (01) mission de plongée chacun

Moyens Materials at Mettre en Œuvre

- Une (01) Embarcation adaptée pour la mission ;
- Equipements de plongé sous marine ;
- Une (01) voiture.

Durée de l'intervention : maintenance du réseau de mesure océanographique une fois par mois durant cinq ans

N. Environmental Economist (International, 1 week per month for 6 months every year over 5 years)

The Economist shall analyse and evaluate the economic impact of climate change, mitigation and adaptation on the coastal sector in Tunisia at the macro and the sectoral level. At the macro level, the task will be to develop suitable economic models to analyse climate change impacts on the economy, for example, GDP, employment, investments, prices, etc. These models should be able to analyse the impact of various scenarios of Sea Level Rise in accordance with AR5. Analysis using integrated assessment models is also envisaged especially with regards to long term assessment. At the sectoral level, the economic analysis, including econometrics, shall examine the impacts of climate change on the Tourism and Agricultural sectors of the economy which are located along the coast as well as analyse various options to mitigate their impact on the climate. Cost and benefit analyses will be used to rank and prioritise the identified adaptation options.

Expertise Required:

The consultant should have the following expertise and experience:-

• An academic (Master degree or equivalent) and professional background in Environmental Economics or a related discipline;

• At least 10 years of relevant working experience;

• Expertise and experience in economic modelling, especially environmental I-O, CGE, GTAP-E, PAGE, etc;

• Expertise and experience in econometric or regression analysis;

• Relevant scientific; technical and economic experience to perform different scenario projections and analyses, with particular emphasis on sea level rise projections;

• Excellent communication skills; both oral and written, in French. Knowledge of Arabic is an advantage.

• Experience in technical report writing and presentation; and

• Prior experience in climate change research, either through involvement in the National Communication for UNFCCC process or similar, is an advantage.

O. Budgeting expert (National, 5 days per quarter every year over 5 years)

The budgeting expert will train APAL and other technical institutions how to budget for recurring costs such as the Operation and Maintenance of equipment.

In this regard, his/her tasks shall include:

- To review the equipment in each relevant institution ;
- To review budget lines in each relevant Ministy's budget for the Operation and Maintenance of Equipment ;
- To contact manufacturers to save for spare parts;
- To provide the technical institutions with budget lines each year.

P. Financial Expert, Specialized in Fund Mobilization (International, 2 weeks per month for 6 months every year over 5 years)

The Financial Expert specialized in fund mobilization will analyze potential financing opportunities for Tunisia with an emphasis on capitalizing the existing coastal management –related funds in Tunisia.

In this regard, his/her tasks shall include:

- To participate in the definition and implementation of a document of resource mobilization strategy ;
- To participate in the drawing of a resource mobilization plan ;
- To identify potential partners towards whom the fund raising activities will be geared, with a particular emphasis on coastal adaptation;
- To participate in the development of programmes that fosters the mobilization of the international financial community.
- Carry out economic and sectoral studies in the sectors of coastal management, water and environment, with a particular focus on the following themes: (i) the development of
- Coastal adaptation measures, (ii) the sharing of the costs and benefits relating to the financing of work projects of common interest

Expertise Required:

- Have a minimum of Master's Degree (Master of Science, Master of Business Administration in project management, fund mobilization);
- An experience in the financing of coastal adaptation, with a relevant experience in the formulation and implementation of programmes and projects on natural resource management would be an advantage;
- Excellent oral and written communication in French is required;
- Have sound knowledge in fund mobilization ;
- Have competence in dialogue and negotiation ;
- Have good skills in the use of financial management software;

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Annex 6: Stakeholder Involvement Plan

237. The Stakeholders identified during project preparation will continue to be implicated in project implementation. A Stakeholder involvement plan has been created to provide a framework to guide interaction between implementing partners and the key stakeholders, particularly end-users to validate project progress. All Stakeholders involved in the baseline self-capacity assessment will be addressed again in order to track the efficacy of Stakeholder capacity building both operationally and technically. Also, gender-focused NGOs/CSOs will conduct a gender disaggregated survey indicating the receipt of alerts and adoption of financial services by women.

238. According to the adaptation pathways approach, the first phase of the project will be to design and implement at the risk assessment process which is founded on the ongoing input and consensus of key coastal stakeholders. This is standard practice in countries such as Australia to ensure that assessments carried out act as appropriate vehicles to advance sustainable adaptive action with participation and validation from key coastal stakeholders. As such, a participatory approach is used at all key decision making junctures. The approach is conducted as follows:

1. Step 1 – The 'Context Setting' Phase of the risk assessment involves a stakeholder workshop to:
    - Agree on overriding adaptation visions and goals
    - Select appropriate scenarios and timeframes for assessment
    - Define key elements against which risk is assessed
    - Agree on appropriate risk evaluation criteria
2. Step 2 – The 'Risk Identification' Phase of the risk assessment involves consensus building exercises to:
    - Identify a pertinent coastal asset register (targeted input from land use planning and management personnel – public and private)
    - Confirm a coastal risk register – (distribution of preliminary risk identification mapping outputs and validation workshop)
3. Step 3 – The 'Risk Evaluation' Phase of the risk assessment involves workshopping/consensus building exercises to:
    - Review the consequence and likelihood of identified risks
    - Review risk levels and assign overall risk prioritization
4. Step 4 - The 'Risk Treatment or Adaptation Assessment' Phase of the risk assessment:
    - Preliminary Adaptation Options Analysis workshop where selection of most appropriate adaptation pathways are presented to stakeholders

- Stakeholder driven prioritization of available options to inform definition of preferred pathway for adaptive action
- Stakeholder validation workshop where target area adaptation plans are presented and signed off on by key decision makers

239. After the risk assessment phase is completed and proposed detailed interventions are agreed upon, the communication and consultation process will take place. This process will be divided into three parts, being:

240. Part 1 – Developing a strategy and action plan;
This is the mobilization phase in the first year of the project. The details of the activities and implementation structures will be designed, partnerships for action will be forged and stakeholder engagement will focus around these design processes.

241. Part 2 – Consultation through implementation; and
This is the main implementation phase where investments will be made on the ground in the target areas and stakeholder consultation about engagement will focus on output oriented action.

242. Part 3 – Project completion and scale up promotion.
The third and final phase represents the completion of the project. The plans for scale-up and long-term sustainability of the SCCF investments will be developed. Consultation will focus on learning, bringing experience together and looking at processes for continued post-project impact.

243. Specifically, in Part 1, gender-focused NGOs/CSOs will continue to be implicated and consulted in order to ensure women are properly engaged/warned. They will also conduct the gender disaggregated survey.

244. In Part 2, public consultations will become more of an on-going exchange of information where there will be two main purposes:

1) to gather information from beneficiaries and stakeholders about the impact and effectiveness of the planned coastal adaptation measures; and
2) to provide interested government and donor stakeholders and the general public with information about the progress and impact of the project as it is implemented.

245. Part 3 will be a process of ensuring completion, hand-over and long-term sustainability of the SCCF investment. Consultation will focus on bringing experience together, sharing key lessons learnt (through the UNDP ALM and other forums) and looking at processes for promoting scale up of this project in order to make more coastal communities resilient to the impacts of climate change.

Overall the types of consultation mechanisms to be used include:

- Preparation meetings with NGOs/CSOs to be implicated;
- Initial consultation meetings in target regions to discuss appropriate adaptation measures;
- Information briefings for government and co-financing institutions on economic instruments and fund mobilization development;
- Initiation of public awareness campaign on coastal adaptation measures as well as the costs and benefits

Annex 7: Key assessment reports

See Coastal Expert Reports Attached

Annex 7a) Maps

Figure 1, Annex 7: Gulf of Tunis, with project target area highlighted

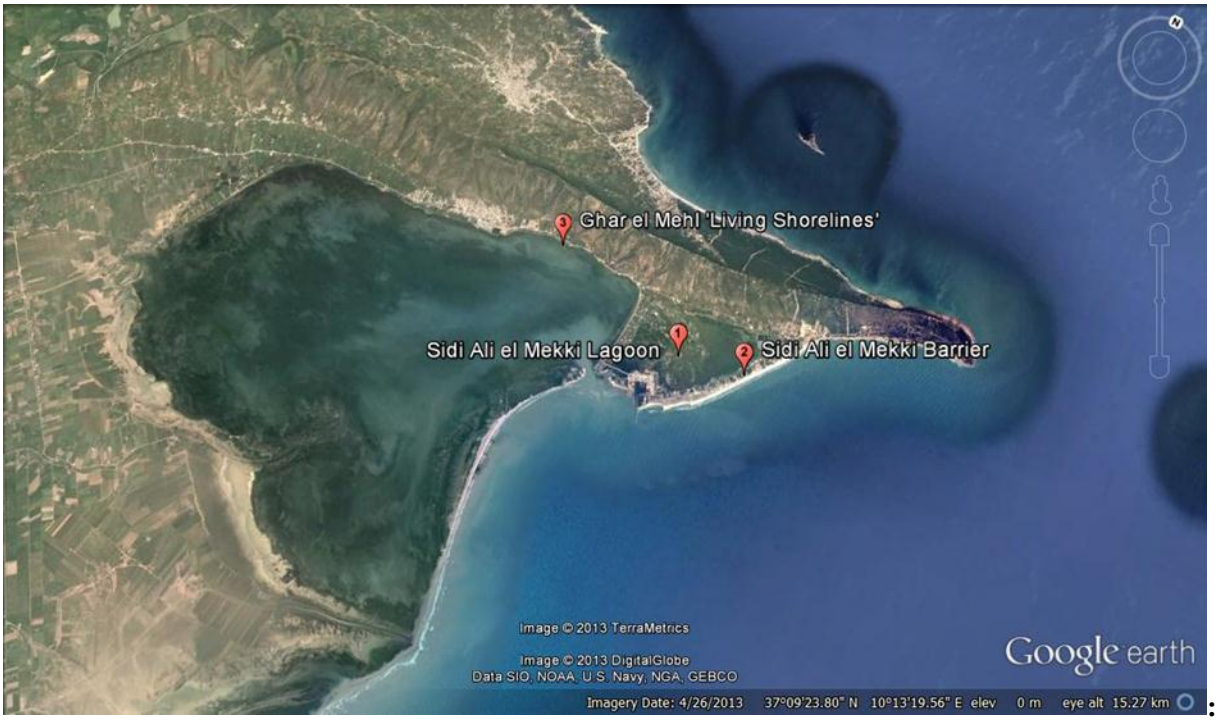

Figure 2, Annex 7: Ghar El Mehl Lagoon (center) and Sidi Ali el Mekki lagoon (smaller enclosed lagoon area to the northeast), Gulf of Tunis project target area

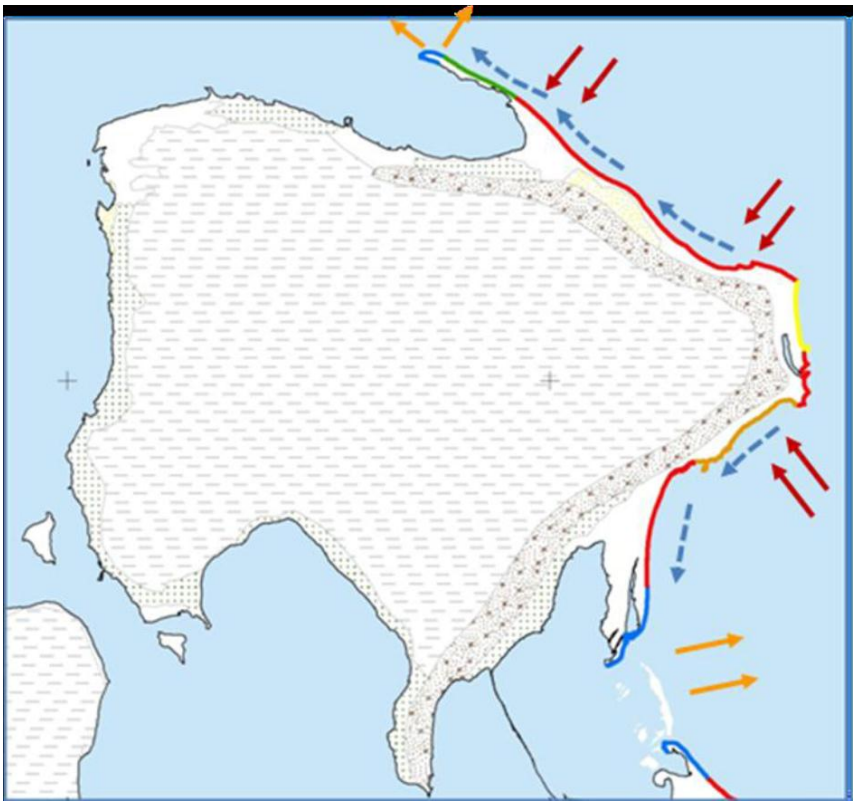

Figure 3 Annex 7: Island of Djerba with indicative sediment transport pathways along the east coast

Figure 4, Annex 7: Island of Djerba, proposed project pilot sites: Ras Errmal spit, NE tourist zone and Sidi Yati beach.

Annex 7b) Flexible Adaptation Pathways and Real Options Concepts

Flexible Adaptation Pathways

'Flexible adaptation pathways' is an approach to adaptation based on recognising and addressing the long-term and uncertain nature of climate change by enabling the systematic adjustment of adaptation strategies in response to new information and changing circumstances, in ways that are as efficient and transparent as possible. They use a risk-based decision framework based upon acceptable and unacceptable levels of risk for different issues; and work on the basis that if flexible adaptation is pursued, then risk will be kept at an acceptable level. They set limits and decision criteria (triggers) for risks which identify when critical thresholds or tipping points are likely to be reached leading to very severe impacts and potentially irreversible consequences. They also identify alternative adaptation pathways for risks should thresholds be approached.

Flexible pathways for adaptation incorporate low and no regrets actions, usually with the implication that these can be implemented now, whilst further research is conducted to enable informed flexible pathways to be established for longer-term aims.

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Real Options for Climate Change Adaptation

The use of 'real options' concepts in climate change adaptation may be motivated by two key elements:

- It is often not necessary to act immediately in response to climate change, and thus any methodology needs to be able to encapsulate the ability of decision-makers to wait before acting and, perhaps more importantly, to provide an input into the decision of when to invest.

- Climate change is subject to considerable uncertainty, and it is crucial that this uncertainty be brought to the centre of the analysis. If it is not, solutions might be optimised to a single "most likely" scenario, but not be robust to even small changes that will inevitably occur to projected scenarios in the future.

The "standard" way of considering investment in infrastructure is to consider the flow of benefits from an investment, in net present value terms, against its likely investment cost; a benefit cost assessment. However, such an approach is inadequate in the face of the two key aspects of climate change noted above, as it is unable to answer the question of when construction ought to occur, or to treat uncertainty in anything but a superficial way, through sensitivity analysis.

For this reason, a real options framework, which is designed precisely with the two issues above in mind is useful. Real options effectively answers the question "how should a decision maker choose her investment (and operation) options given all that is known at present about how the future might unfold?". By contrast, a benefit cost analysis answers the question "what return might a decision maker expect from an investment made at point in time x, given a single (or small collection of probability-weighted; something rarely done in practice) scenario for the future?". The outputs of a real options analysis are much richer than for a benefit cost analysis and include the optimal timing of investment, the value of that investment and an indication of the statistical confidence (that is, robustness) of the results. In practice, a real options analysis can also often favour solutions that are robust over a range of potential outcomes over solutions that are perfectly tailored to only one.

There are several ways in which a real options analysis can be done, and a considerable literature examining the equivalence between them. We make use of an approach by Longstaff & Schwarz (2001) which overcomes some technical issues with "classical" real-options analysis in terms of the number of sources of uncertainty that can be accommodated, and the complexity with which a real options approach is implemented. In practice, the approach follows these five steps for each option and asset in each case study area:

1. A climate change model is used to generate several thousand different future scenarios, which map out how climate change might affect the region over the coming century. The physical changes are then converted into scenarios for value at risk for each asset in each case study area over the same timeframe.
2. The Net Present Value (NPV) of a stream of benefits that (that is, improvements in value at risk) that occur from implementing a particular adaptation option for each asset in each case study area in each year for each scenario is compared with the stream of benefits (that is, value at risk) of doing nothing in each case. This is called the "NPV difference".
3. The real options model, recognising that uncertainty about the future exists at every point in time, uses information from all the scenarios to form an expectation of the NPV difference at each point in time for each scenario, based upon the NPV difference that is actually calculated for that point in time. It thus captures how a decision-maker might answer the question "where will climate change take us next?"
4. The real options model then compares the net benefit of acting (that is, NPV difference minus the cost of the option) in each time period in each scenario with the expectation of the net benefit of acting in the next time period. Through a process of backwards induction (from the last period to the first) it then shows all of the periods when it pays to act now for each scenario; when the current net benefit

is greater than the expectation of the future net benefit. We choose as our optimum (in each scenario) the earliest of these cases.[53]

5. Finally, the model collects all of the optimum solutions (that is, one from each scenario) for each option into a histogram which shows when the optimal timing is given all the information available (the mean of the distribution, in most cases) and, from the shape of the histogram, the level of confidence in these conclusions. The value of the option is an average across all of the scenarios, once the value in each has been converted to the same form via discounting.

Proposed Real Options Approach Modified from:

Climate Change Adaptation Options Assessment – Developing flexible adaptation options for the Peron-Naturaliste Coastal region of Western Australian, ACIL Tasman September 2012

[53] The methodology does not require that the earliest case be chosen. For a profit-making investment, for example, the maximum difference between current and expected future benefits could be used. By using this approach, we are assuming that local governments do not wish to act too early, but are risk averse, rather than benefit maximising, and would prefer to protect early rather than risk the assets under their stewardship. This assumption should be recalled when examining model results; the model can produce early intervention recommendations when the value of the asset is high and the cost of protection is low, and the results do not imply that action must be taken by the relevant date.

Annex 8: Environmental and Social Screening Procedure (ESSP)

Note, risks here have been mentioned in the risk section of the Project Document because this is a Category 3a project according to the UNDP ESSP.

(See attached)